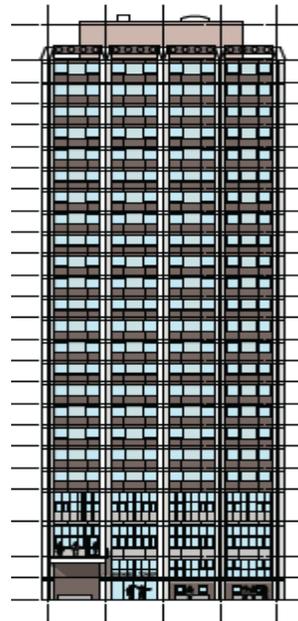




BREEAM Domestic Refurbishment Pre-Assessment, Rev C



Grenfell Tower, London.

July 2013

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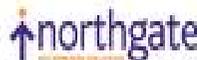
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Revision:		A	B	C
Date:	22/08/2012	1/10/2012	17/10/2012	01/06/2013
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1.0 Scope

This BREEAM Domestic Refurbishment Pre-Assessment Estimate for Grenfell Tower, a twenty three storey residential block in London, has been prepared to support the planning application for the Grenfell Tower refurbishment scheme, to be submitted to the Royal borough of Kensington & Chelsea. Also, the BREEAM pre assessment estimate aims to provide the outline sustainability strategy and act as a sustainable design guide for the refurbishment scheme.

The Pre-assessment is an estimate that sets out the method for which the proposed refurbishment could achieve a BREEAM rating of “Good”.

This report and estimate has been based on information provided by:

- Studio E architects
- Appleyards (Project Management)
- Max Fordham (Energy & M&E Consultant).
- KALC

2.0 Executive Summary

The Pre-Assessment Estimate shows that at by achieving the minimum standard requirements together with assumptions of good sustainable design practice the proposed refurbishment project could achieve a BREEAM rating of “Good”.

The Mechanical and Electrical specification of the building and materials used in the refurbishment of the building will be essential to the sustainable performance of the building and need to be addressed at an early stage in the design process. This assessment together with the Sustainability and Energy statement prepared by Max Fordham are therefore the starting point for developing the overall strategy of the building’s sustainable design.

The BREEAM “Very Good” rating is a planning policy requirement as it is set out in Core Strategy Policy CE1 of the Royal Borough of Kensington & Chelsea Local Development Framework. However, BREEAM “Very Good” rating will not be able to be achieved for this project since the mandatory requirement for Wat 01 category cannot be met. The mandatory requirement of Wat 01 is not met since it falls outside the scope of the Grenfell Tower project. The reduction in CO₂ emissions is achieved by energy efficient design measures incorporated into the building fabric such as High Efficiency Gas Fired Boilers and Low U value windows.

3.0 Project Details

PROJECT :	Grenfell Tower.
CLIENT:	KCTMO
ARCHITECT:	Studio E Architects
BUILDING SERVICES & LZC CONSULTANT:	Max Fordham
BREEAM CONSULTANT:	Syntegra Consulting.
Structural Engineer	Curtins Consulting.
PRINCIPAL CONTRACTOR:	Leadbitter.

4. BREEAM Domestic Refurbishment

BREEAM Domestic Refurbishment is a performance based assessment method and certification scheme for refurbished buildings. The primary aim of BREEAM Domestic Refurbishment is to mitigate the life cycle impacts of refurbished buildings on the environment 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 design and procurement process.

BREEAM Domestic Refurbishment has been developed to meet the following principles:

- Ensure environmental quality through an accessible, holistic and balanced measure of environmental impacts.
- Use quantified measures for determining environmental quality.
- Adopt a flexible approach, avoiding prescriptive specification and design solutions.
- Use best available science and best practice as the basis for quantifying and calibrating a cost effective performance standard for defining environmental quality.
- Reflect the social and economic benefits of meeting the environmental objectives covered.

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- Provide a common framework of assessment that is tailored to meet the 'local' context including regulation, climate and sector.
- Integrate construction professionals in the development and operational processes to ensure wide understanding and accessibility.
- Adopts existing industry tools, practices and other standards wherever possible to support developments in policy and technology, build on existing skills and understanding and minimize costs.
- Stakeholder consultation to inform ongoing development in accordance with the under-lying principles and the pace of change in performance standards.

4.1 BREEAM Domestic Refurbishment Environmental Issues

The environmental issues under which BREEAM assesses a building are divided up into the following seven categories:

- Management
- Health and well-being
- Energy
- Water
- Materials
- Waste
- Pollution

4.2 BREEAM Domestic Refurbishment Scoring & Rating

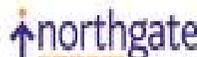
There elements that determine the overall performance of a refurbished project assessed using BREEAM Domestic Refurbishment, the following:

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

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The BREEAM rating level benchmarks:

The BREEAM Domestic Refurbishment rating benchmarks are shown on the following table:

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

An unclassified BREEAM rating represents performance that is non-compliant with BREEAM, in terms of failing to meet either the BREEAM minimum standards of performance for key environmental issues or the overall threshold score required for formal BREEAM certification.

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The minimum BREEAM Domestic Refurbishment standards:

In order to ensure that performance against fundamental environmental issues is achieved in pursuit of a desired BREEAM rating, minimum standards of performance are set in key areas such as energy, water, waste etc. To achieve a particular BREEAM rating, the minimum overall percentage score must be achieved together with the minimum standards, detailed in the Table below.

BREEAM issue	Minimum standards by BREEAM rating level				
	Pass	Good	Very Good	Excellent	Outstanding
Ene 02: Energy Efficiency Rating Post Refurbishment	0.5 Credits	1.0 Credits	2 Credits	2.5 Credits	3.5 Credits
Wat 01: Internal Water use	-	-	1 Credit	2 Credits	3 Credits
Hea 05: Ventilation	1 Credit	1 Credit	1 Credit	1 Credit	1 Credit
Hea 06: Safety	1 Credit	1 Credit	1 Credit	1 Credit	1 Credit
Pol 03: Flooding	-	-	-	2 Credits	2 Credits
Mat 02: Responsible sourcing of materials	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only

The environmental section weightings :

BREEAM uses an explicit weighting system derived from a combination of consensus based weightings and ranking by a panel of experts. Each of the environmental sections consists of a differing number of assessment issues and BREEAM credits. Hence, each individual assessment issue and credit varies in terms of its contribution to a building's overall score.

The Table below outlines the weightings for each of the nine environmental sections included in the BREEAM 2011 New Construction scheme

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Environmental section	Weighting
Management	12%
Health & Wellbeing	17%
Energy	43%
Water	11%
Materials	8%
Waste	3%
Pollution	6%
Total:	100%
Innovation (additional)	10%

The BREEAM assessment issues and credits:

BREEAM Domestic Refurbishment consists of thirty three individual assessment issues spanning the seven environmental categories, plus an eighth category called 'innovation'. Each issue addresses a specific building related environmental impact or issue and has a number of 'credits' assigned to it.

'BREEAM credits are awarded where a building demonstrates that it meets the best practice performance levels defined for that issue.

Innovation credits are available for the recognition of sustainability related benefits or performance levels which are currently not recognised by standard BREEAM assessment issues and criteria. In that way, buildings that go beyond best practice in terms of a particular aspect of sustainability may be awarded.

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5. Grenfell Tower BREEAM Domestic Refurbishment Pre-assessment performance result

This project has achieved a Pre-Assessment target score of 45.25% against the BREEAM Domestic Refurbishment Pre-assessment criteria. This translates to a Pre-Assessment target rating of “Good”. The mandatory standard for “Very Good” of Wat 01 issue cannot be met due to the fact of being outside the scope of this project. Hence the BREEAM rating targeted for the project is “Good”.

BREEAM Environmental Category	Environmental Weighting	Credit Available	Credits Targeted	Section Score
Management	12%	11	11	12%
Health & Wellbeing	17%	12	4	5.67%
Energy	43%	29	10	14.83%
Water	11%	4	1	2.2%
Materials	8%	45	31	5.51%
Waste	3%	5	3	1.80%
Pollution	6%	8	3	2.25%
Innovation	10%	10	1	0.00%
Total Indicative BREEAM Score	45.25% GOOD Rating			

Note: As the design is progressed, the pre-assessment may be subject to change and the score therefore is indicative only at this stage.

Specialist Reports, Calculations and other specialist items:

In order to achieve the GOOD rating the below specialist reports need to be produced:

- Flood Risk Assessment. (Curtins Consulting)
- Ecology Report. (KALC)
- Hydrologist Report (Surface Water Run-off calculations). (Curtins Consulting)
- Building User guide.
- Site Waste Management Plan. (Leadbitter)

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6. Grenfell Tower BREEAM Domestic Refurbishment Pre-Assessment Issue Scoring Report

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BREEAM Domestic Refurbishment 2012 Pre-Assessment Estimator v0.6: Results Summary



Building name	
Indicative Building Score	45.25%
Indicative Building Rating	BREEAM Good

This assessment and indicative BREEAM rating is not a formal certified BREEAM assessment or rating and must not be communicated as such. The score presented is indicative of a dwelling's potential performance and is based on a simplified pre-formal BREEAM assessment and unverified commitments given at an early stage in the design process.

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Management	Man 01	3	3	12%	12.00%
	Man 02	2	2		
	Man 03	1	1		
	Man 04	2	2		
	Man 05	1	1		
	Man 06	2	2		

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Health and Wellbeing	Hea 01	2	0	17%	5.67%
	Hea 02	4	0		
	Hea 03	1	1		
	Hea 04	2	1		
	Hea 05	2	1		
	Hea 06	1	1		

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Energy	Ene 01	6	3	43%	14.83%
	Ene 02	4	2.5		
	Ene 03	7	4.5		
	Ene 04	2	0		
	Ene 05	2	0		
	Ene 06	1	0		
	Ene 07	2	0		
	Ene 08	2	0		
	Ene 09	2	0		
	Ene 10	1	0		

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Water	Wat 01	3	0	11%	2.20%
	Wat 02	1	1		
	Wat 03	1	0		

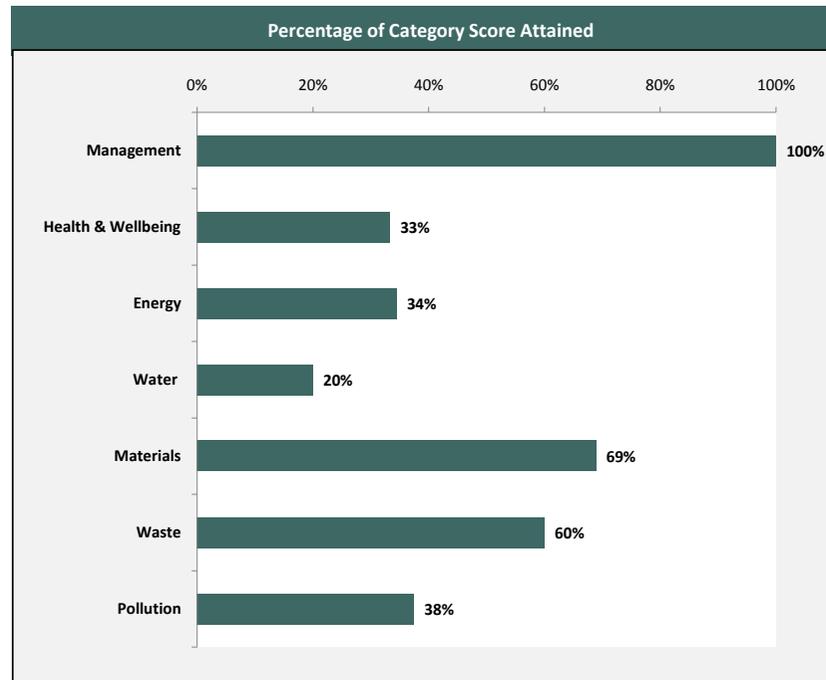
	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Materials	Mat 01	25	19	8%	5.51%
	Mat 02	12	4		
	Mat 03	8	8		

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Waste	Was 01	2	0	3%	1.80%
	Was 02	3	3		

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Pollution	Pol 01	3	0	6%	2.25%
	Pol 02	3	1		
	Pol 02	2	2		

	Issue	Credits Available	Indicative Credits Achieved	Weighting	Section Score
Innovation		10	1	N/A	1.00%

	Minimum Standards				
	Pass	Good	Very Good	Excellent	Outstanding
Ene 02	✓	✓	✓	✓	✗
Wat 01	✓	✓	✗	✗	✗
Hea 05	✓	✓	✓	✓	✓
Hea 06	✓	✓	✓	✓	✓
Pol 03	✓	✓	✓	✓	✓
Mat 02	✓	✓	✓	✓	✓





BREEAM Domestic Refurbishment 2012 Pre-Assessment Estimator v0.6

This assessment and indicative BREEAM rating is not a formal certified BREEAM assessment or rating and must not be communicated as such. The score presented is indicative of a dwelling's potential performance and is based on a simplified pre-formal BREEAM assessment and unverified commitments given at an early stage in the design process.

Building name: _____
 Indicative building score (%): **45.25%**
 Indicative BREEAM rating: **BREEAM Good**

Management | Health & Wellbeing | Energy | Water | Materials | Waste | Pollution

	Minimum Standards				
	Pass	Good	Very Good	Excellent	Outstanding
Ene 02	✓	✓	✓	✓	✗
Wat 01	✓	✓	✗	✗	✗
Hea 05	✓	✓	✓	✓	✓
Hea 06	✓	✓	✓	✓	✓
Pol 03	✓	✓	✓	✓	✓
Mat 02	✓	✓	✓	✓	✓

INNOVATION Section Weighting: 10% Indicative Section Score: 1.00%

Comments: _____

MANAGEMENT Section Weighting: 12% Indicative Section Score: 12.00%

Man 01 Home Users Guide

No. of BREEAM credits available	3	Available contribution to overall score	3.27%
No. of BREEAM innovation credits	0	Minimum Standards applicable:	No

Assessment Criteria
 Where a Home Users Guide be provided to all dwellings, covering all issues set out in the 'Users Guide Contents list', three credits may be awarded **Indicative Credits: 3**

Comments
 The Design team has indicated that a home user guide will be rproduced. This is also confirmed within the Energy and Sustainability statement. The Home User Guide is expected to cover all listed items in the User Guide Contents List outlined in the BREEAM Domestic Refurbishment Manual 2012.

Man 02 Responsible Construction Practices

No. of BREEAM credits available	2	Available contribution to overall score:	2.18%
No. of BREEAM innovation credits	1	Minimum Standards applicable:	No

Assessment Criteria
 Where a compliant considerate construction scheme will be used, credits are awarded depending the score achieved as outlined below: **Indicative Credits: 2**

	One Credit	Two Credits
Large Scale - project with more than 5 units		
Considerate Constructors Scheme	Score of 24 - 31.5	Score of 32 - 35.5
Alternative Compliant Scheme	Compliance	Beyond Compliance
Small Scale - project with 5 units or fewer		
Considerate Constructors Scheme	24 - 31.5	32 - 35.5
Alternative Compliant Scheme	Compliance	Beyond Compliance
Checklist A-4	50% of the optional items	80% of the optional items
Exemplary Credit		
Considerate Constructors Scheme	Score of >36	* Small Scale Project Only
Alternative Compliant Scheme	Exemplary Level Compliance	
Checklist A-4*	All Items (Optional & Mandatory)	

Indicative Innovation Credits Achieved: Please Select

Comments
 2No Credit has been awarded since it is assumed that the principal contractor will use the Considerate Constructors Scheme (CCS) with a score of 32-35.5 .

Man 03 Construction Site Impacts

No. of BREEAM credits available	1	Available contribution to overall score	1.09%
No. of BREEAM innovation credits	0	Minimum Standards applicable	No

Assessment Criteria
 Where evidence demonstrate that site impacts will be monitored, as detailed below: **Indicative Credits: 1**

	One Credit
Large Scale	Where there is evidence to demonstrate that 2 or more of the sections in Checklist A-5 are completed
Small Scale	Where there is evidence to demonstrate that 2 or more of the sections in Checklist A-6 are completed

Sections of Checklist	
Large Scale - Checklist A-5	Small Scale - Checklist A-6
Monitor, report and set targets for CO2 production of energy use arising from site activities	Set objectives for reducing CO2 production from energy use arising from site activities
Monitor, report and set targets for water consumption arising from site activities	Set objectives for reducing water use arising from site activities
A main contractor with an environmental materials policy	Main contractor environmental materials statement
A main contractor that operates an Environmental Management System	80% of site timber is reclaimed, re-used or responsibly sourced
80% of site timber is reclaimed, re-used or responsibly sourced	

Same definition of small and large scale as in Man 02

Comments
 1No Credits will be achieved since it is assumed that the main contractor will (i)monitor, report and set targets for CO2 production of energy use arising from site activities and (ii) operates an Environmental Management System.

Man 04 Security			
No. of BREEAM credits available	2	Available contribution to overall score:	2.18%
No. of BREEAM innovation credits	0	Minimum Standards applicable:	No
Assessment Criteria			Indicative Credits
Where the following requirements will be met:			2
One Credit Secure windows and doors	External doors and accessible windows meet minimum standards and appropriately certified		→
	Principles and guidance of Secured by Design Section 2 are complied with		
Two Credits Secured by design	A suitably qualified security consultant is consulted at the design stage and their recommendations are incorporated into the refurbishment		→
Comments			
1 No credit will be achieved since it the Energy and Sustainability Statement states that the External Doors and accessible windows meet the following criteria: Doors are certified to: PAS 24:2007 or LPS 1175 Issue 7 Security Rating 1 1 or equivalent Windows are certified to: BS 7950:1997 (36) and LPS 1175 Issue 7 Security Rating 1 or equivalent			
Man 05 Protection and Enhancement of Ecological Features			
No. of BREEAM credits available	1	Available contribution to overall score:	1.09%
No. of BREEAM innovation credits	1	Minimum Standards applicable:	No
Assessment Criteria			Indicative Credits
Where the following requirements will be met:			1
One Credit Protecting Ecological Features	Site survey carried out to determine presence of ecological features		→
	Statutory Nature Conservation Organisation notified of protected species		
	Features of ecological value protected during refurbishment works		
Exemplary Credit Ecological enhancement	A suitably qualified ecologist recommends features to enhance ecology of the site		→
	adopts all general ecological recommendations		
	adopts 30% of additional recommendations		
Comments			
It is expected that a site survey will be carried out to determine presence of ecological features and if any, these will be protected during refurbishment works.			
Man 06 Project Management			
No. of BREEAM credits available	2	Available contribution to overall score:	2.18%
No. of BREEAM innovation credits	2	Minimum Standards applicable:	No
Assessment Criteria			Indicative Credits
Where the following requirements will be met:			2
One Credit Project Roles and Responsibilities	Where all of the project team are involved in the project decision making		→
	Small Scale - the project manager assigns individual and shared responsibilities amongst the project team including all trades on site		
	Large Scale - the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation		
Small Scale projects: five units or fewer or less than £100k		Large Scale projects: more than five units or more than £100k	
One Credit Handover and Aftercare	Handover meeting arranged		→
	2 or more of the following committed to: - A site inspection within 3 months of occupation - Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation - 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		
Exemplary Credits			Indicative Innovation Credits Achieved
One Exemplary Credit Early Design Input	Where A BREEAM Accredited Professional has been appointed to oversee key stages within the project. OR Where a BREEAM Domestic Refurbishment Assessor has been appointed at an early stage of the project, prior to the production of a refurbishment specification		→
One Exemplary Credit Thermographic Surveying and Airtightness Testing	Where Thermographic surveying and Airtightness testing have been carried out at both pre and post refurbishment stages		→
	Where an improved air tightness target has been set at design stage and testing demonstrates that this has been achieved post refurbishment		
Comments			
3No Credit will be achieved since a BREEAM AP has been appointed (Syntegra) and the Project manager (Appleyards) has assigned individual and shared responsibilities across the following key design and refurbishment stages: (i)Planning and Building control notification (ii)Design (iii)Refurbishment (iv)Commissioning and handover (v)Occupation. Also, a handover meeting will be arranged a)A site inspection within 3 months of occupation and b) post occupancy interviews will be conducted with building occupants or a survey via phone or post.			

HEALTH & WELLBEING		Section Weighting: 17%		Indicative Section Score 5.67%	
Hea 01 Daylighting					
No. of BREEAM credits available	2	Available contribution to overall score	2.83%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria					Indicative Credits
Where the refurbishment results in a neutral impact on daylighting or where minimum daylighting standards are met, up to two credits may be awarded as follows:					0
For Existing Dwellings and Change of Use Projects					
First Credit Maintaining Good Daylighting	The refurbishment results in a neutral impact on the dwellings daylighting levels in the kitchen, living room, dining room and study				
Where the property is being extended					
First Credit Maintaining Good Daylighting	New spaces achieve minimum daylighting levels				
The extension does not reduce daylighting levels in the kitchen, living room, dining room or study of neighbouring properties					
For All Properties					
Second Credit Minimum Daylighting	The dwelling achieves minimum daylighting levels in the kitchen, living room, dining room and study				
Comments					
MF's sustainability and energy statement present the results of the daylight calculations. These show that the daylighting to existing areas reduce post refurbishment. Hence no credits can be awarded.					
Hea 02 Sound Insulation					
No. of BREEAM credits available	4	Available contribution to overall score	5.67%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria					Indicative Credits
To ensure the provision of acceptable sound insulation standards and so minimise the likelihood of noise complaints.					Please Select
Properties where sound testing has been carried out:					
Up to Four Credits	Four credits awarded according to the improvement over building regulations. See table in additional information in Technical Manual				
Properties where sound testing is not feasible and not required by the appointed Building Control body					
Two Credits	Where existing separating walls and floors are designed to meet the requirements of Building Regulations with compliant construction details				
Up to Four Credits	Where a Suitably Qualified Acoustician (SQA) provides recommendations for the specification of all existing separating walls and floors				
	SQA confirms in their professional opinion that they have the potential to meet or exceed the sound insulation credit requirements				
	Where these recommendations are implemented				
See table in additional information in Technical Manual					
Historic Buildings					
Up to Four Credits	Where the dwelling is a Historic Building and sound testing results demonstrate existing separating walls and floor meet the Historic Building credit requirements				
See table in additional information in Technical Manual					
Detached Properties					
Four Credits	By Default				
Properties with separating walls or floors only between non habitable rooms OR Testing not required by building control body					
Four Credits	By Default				
Comments					
An acoustics consultant has already been on board and has produced a noise assessment. In the detailed stages of the project an assessment will be made of the expected reduction in internal noise levels as a result of the refurbishment. However since no confirmation is currently available these credits are withheld					
Hea 03 Volatile Organic Compounds					
No. of BREEAM credits available	1	Available contribution to overall score	1.42%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria					Indicative Credits
Where the refurbishment avoids the use of VOCs with new products meeting the following requirements:					1
One Credit Avoiding the use of VOCs	Where all decorative paints and varnishes used in the refurbishment have met the requirement listed in table 5.4 in the Technical Manual				
	Where at least five of the eight remaining product categories listed in table 5.4 have met the testing requirements and emission levels for Volatile Organic Compound (VOC) emissions against the relevant standards identified within table 5.4 in the Technical Manual				
	Where five or less products are specified within the refurbishment, all must meet the requirements in order to achieve this credit.				
Comments					
It is assumed that at least five of the categories listed in table 5.4 of the BREEAM domestic Refurbishment manual will meet the testing requirements and emission levels for VOC emissions against the relevant standards identified in table 5.4. MF's sustainability and energy statement also suggests that this credit will be achieved.					
Hea 04 Inclusive Design					
No. of BREEAM credits available	2	Available contribution to overall score	2.83%		
No. of BREEAM innovation credits	1	Minimum Standards applicable	No		
Assessment Criteria					Indicative Credits
Where an access statement has been carried out using Checklist A-8 of the Technical Manual to optimise the accessibility of the home as follows:					1
Checklist A-8 of the Technical Manual					
One Credit Minimum Accessibility	Section 1	Section 2			
	Completed with Evidence	Completed with Evidence			
Two Credits Advanced Accessibility	Completed with Evidence	Completed with Evidence			
Exemplary Performance					
One Credit	Where an access expert suitably qualified member of the design team has completed sections 1, 2 and 3 of Checklist A-8, access statement template with evidence provided of the measures implemented in the refurbishment				
					Indicative Innovation Credits Achieved Please Select
Comments					

An Access statement will be produced and checklist A-8 of the BREEAM technical manual will be completed by a member of the design team.

Hea 05 Ventilation			
No. of BREEAM credits available	2	Available contribution to overall score	2.83%
No. of BREEAM innovation credits	0	Minimum Standards applicable	Yes
Assessment Criteria			Indicative Credits
Where the dwelling meets the following ventilation requirements:			1
One Credit Minimum Ventilation Requirements	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, 2010		→
	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 2010.		
	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, 2010.		
	It is an historic building and meets historic building requirements in CN4 of the technical manual		
Two Credits Advanced Requirements	Ventilation is provided for the dwelling that meets the requirements of Section 5 of Building Regulations Part F in full		→
	Where the building is a historic building and meets the requirements for Historic Buildings in compliance note 4 of the technical manual		

Comments

It has been assumed that

- 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, 2010
- 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 2010.
- A minimum level of purge ventilation is provided in all habitable rooms and wet rooms, compliant with section 7, Part F, 2010.

Hea 06 Safety			
No. of BREEAM credits available	1	Available contribution to overall score	1.42%
No. of BREEAM innovation credits	0	Minimum Standards applicable	Yes
Assessment Criteria			Indicative Credits
Where a fire and carbon monoxide (CO) detection and alarm system is specified as follows:			1
One Credit Fire and Carbon Monoxide (CO) Detection and Alarm Systems	Carbon Monoxide detector installed if dwelling is supplied with mains gas or other fossil fuel		→
	Where a compliant fire detection and fire alarm system is provided		
	Mains supplied fire detection and alarm system if project involves re-wiring		
	Battery operated fire detection and alarm system if no re-wiring is to take place		

Comments

It is expected that Fire and carbon monoxide detectors will be installed in each flat.

ENERGY

Section Weighting: 43%

Indicative Section Score 14.83%

Ene 01 Improvement in Energy Efficiency Rating			
No. of BREEAM credits available	6	Available contribution to overall score	8.90%
No. of BREEAM innovation credits	0	Minimum Standards applicable	No
Assessment Criteria			Indicative Credits
Where the following targets are met for the improvement in Energy Efficiency Rating achieved as a result of refurbishment:			3
	Improvement in EER	Credits	→
	≥ 5	0.5	
	≥ 9	1	
	≥ 13	1.5	
	≥ 17	2	
	≥ 21	2.5	
	≥ 26	3	
	≥ 31	3.5	
	≥ 36	4	
	≥ 42	4.5	
	≥ 48	5	
	≥ 54	5.5	
	≥ 60	6	

Comments

The M&E consultant MF have undertaken the pre refurbishment SAP calculations as designed post refurbishment SAP calculations. The proposed strategy is for individual Gas fired boilers. The energy averaging is applied for multiple dwellings. The average EER improvement is 27, and therefore 3No credits will be achieved.

Ene 02 Energy Efficiency Rating Post Refurbishment			
No. of BREEAM credits available	4	Available contribution to overall score	5.93%
No. of BREEAM innovation credits	2	Minimum Standards applicable	Yes
Assessment Criteria			Indicative Credits
Where the following Energy Efficiency Rating benchmarks will be met as a result of refurbishment:			2.5
	EER post refurbishment	Credits	Minimum requirements
	≥50	0.5	'Pass' level EER of 50
	≥55	1	'Good' level EER of 58
	≥60	1.5	
	≥65	2	'Very Good level' EER of 65
	≥70	2.5	'Excellent' level EER of 70
	≥75	3	
	≥80	3.5	'Outstanding' level EER of 81
	≥85	4	
	Exemplary	Credits	Indicative Innovation Credits Achieved
	≥90	1	Please Select
	≥100	2	→

Comments

The average EER for post refurbishment is 73. Therefore, 2.5No credits are achieved. As stated in Ene 01 the SAP calculations have been produced by the M&E consultant MF.

Ene 03 Primary energy demand					
No. of BREEAM credits available	7	Available contribution to overall score	10.38%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria			Indicative Credits		
Where the following Primary Energy Demand benchmarks will be met as a result of refurbishment:			4.5		
	Primary Energy Demand Post Refurbishment (kWh/m ² /year)	Credits			
	≤ 400	0.5	⇒		
	≤ 370	1			
	≤ 340	1.5			
	≤ 320	2			
	≤ 300	2.5			
	≤ 280	3			
	≤ 260	3.5			
	≤ 240	4			
	≤ 220	4.5			
	≤ 200	5			
	≤ 180	5.5			
	≤ 160	6			
	≤ 140	6.5			
	≤ 120	7			
Comments					
As a result of the refurbishment the average area weighted primary energy demand will be 215 kWh/m ² /year. Therefore, 4.5 No Credits will be achieved.					
Ene 04 Renewable Technologies					
No. of BREEAM credits available	2	Available contribution to overall score	2.97%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria			Indicative Credits		
Where the dwelling will meet the following % contribution from renewables and primary energy demand targets as a result of refurbishment			Please Select		
	Dwelling Type	Primary Energy Demand	Percentage from Renewables		
			1 Credit		
			2 Credits		
	Detached	≤ 250 kWh/m ² /year	≥10%	≥20%	⇒
	Semi-Detached		≥10%	≥20%	
	Bungalow		≥10%	≥20%	
	End of Terrace		≥10%	≥20%	
	Mid Terrace	≤ 220 kWh/m ² /year	≥10%	≥20%	
	Low Rise Flat		≥10%	≥20%	
	Mid Rise Flat		≥10%	≥15%	
	High Rise Flat		≥10%	≥15%	
Comments					
No LZC technologies have been proposed. Hence no credits can be awarded under this category.					
Ene 05 Energy Labelled White Goods					
No. of BREEAM credits available	2	Available contribution to overall score	2.97%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria			Indicative Credits		
Where Energy Efficiency White goods are to be provided as follows:			Please Select		
First Credit					
	Appliance	Appliance provided	Appliance not to be provided		
	Fridges, Freezers and Fridge-Freezers	Energy Saving Trust Recommended appliances specified	EU Energy Efficiency Labelling Scheme Information Leaflet provided to all dwellings		
Second Credit					
	Appliance	Appliance provided	Appliance not to be provided		
	Washing Machines and Dishwashers	Energy Saving Trust Recommended appliances specified	Second credit not achieved		
	Washer-Dryers and Tumble Dryers	Appliances specified with B Rating under EU Energy Efficiency Labelling Scheme	EU Energy Efficiency Labelling Scheme Information Leaflet provided to all dwellings		
Comments					
N/A. This is not in the scope of the refurbishment.					
Ene 06 Drying Space					
No. of BREEAM credits available	1	Available contribution to overall score	1.48%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria			Indicative Credits		
Where adequate, secure internal or external space with posts and footings or fixings is provided with the following:			Please Select		
	1 Credit				
	Number of bedrooms	Drying line required			
	1-2	4m+	⇒		
	3+	6m+			
Comments					
N/A. This is not in the scope of the refurbishment.					
Ene 07 Lighting					
No. of BREEAM credits available	2	Available contribution to overall score	2.97%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria			Indicative Credits		
Where energy efficient internal and external lighting is provided as follows:			Please Select		
	External Lighting - 1 Credit				
	Energy Efficient Space Lighting and Energy Efficient Security Lighting OR Where Energy Efficient Space Lighting is provided ONLY		⇒		
	Internal Lighting - 1 Credit				
	Maximum average wattage across the total floor area of the dwelling of 9 watts/m ²				
Comments					
N/A. This is not in the scope of the refurbishment.					

Ene 08 Display Energy Devices				
No. of BREEAM credits available	2	Available contribution to overall score	2.97%	
No. of BREEAM innovation credits	1	Minimum Standards applicable	No	
Assessment Criteria				Indicative Credits
Where consumption data is displayed to occupants by a compliant energy display device				Please Select
Electricity usage data displayed		Primary Heating Fuel		⇒
Electricity usage data displayed		Electricity	Other	
Primary Heating Fuel usage data displayed		N/A	1 credit awarded	
Electricity & Primary Heating Fuel usage displayed		N/A	2 credits awarded	
Exemplary Credits				Indicative Innovation Credits Achieved
One credit Recording consumption data		Where any compliant Energy Display Device is capable of recording consumption data		Please Select
Comments				
N/A. This is not in the scope of the refurbishment. ⇒				
Ene 09 Cycle Storage				
No. of BREEAM credits available	2	Available contribution to overall score	2.97%	
No. of BREEAM innovation credits	0	Minimum Standards applicable	No	
Assessment Criteria				Indicative Credits
Where individual or communal compliant cycle storage is provided as follows:				Please Select
Dwelling Size	One Credit	Two Credits		⇒
Studios/ 1 bedroom	1 per two dwellings	1 per dwelling		
2-3 bedrooms	1 per dwelling	2 per dwelling		
4 bedrooms	2 per dwelling	4 per dwelling		
Comments				
N/A. This is not in the scope of the refurbishment. ⇒				
Ene 10 Home Office				
No. of BREEAM credits available	1	Available contribution to overall score	1.48%	
No. of BREEAM innovation credits	0	Minimum Standards applicable	No	
Assessment Criteria				Indicative Credits
Where sufficient space and services will be provided to allow occupants to set up a home office in a suitable room with adequate ventilation				Please Select
Comments				
N/A. This is not in the scope of the refurbishment. ⇒				
WATER Section Weighting: 11% Indicative Section Score 2.20%				
Wat 01 Internal Water Use				
No. of BREEAM credits available	3	Available contribution to overall score	6.60%	
No. of BREEAM innovation credits	1	Minimum Standards applicable	Yes	
Assessment Criteria				Indicative Credits
Where the dwellings water consumption meets the following consumption benchmarks, or where terminal fittings meet the following water consumption standards:				Please Select
Calculated Water Consumption (litres/person/day)	Equivalent terminal fitting standards	Minimum Standard	Credits	⇒
>150	Typical baseline performance	N/A	0	
140-150	All showers specified to 'Good' OR All taps and WC's to 'Good' OR Kitchen fittings specified to 'Excellent'	N/A	0.5	
129-139	All showers specified to 'Excellent' OR All showers and bathroom taps to 'Good'	BREEAM Very Good	1	
118-128	All bathroom and WC room fittings specified to 'Good' OR All bathroom fittings specified to 'Excellent'	N/A	1.5	
107-117	All Bathroom and WC room fittings specified to 'Excellent' OR All Bathroom fittings Specified to 'Excellent' and WC room fitting specified to 'Good' OR All Bathroom fittings, kitchen and utility fittings specified to 'Good'	BREEAM Excellent	2	
96-106	All kitchen, bathroom, utility room and WC room fittings specified to 'Good' OR All bathrooms, kitchens and utility rooms specified to 'Excellent'	N/A	2.5	
<95	All bathroom fittings specified to 'Excellent' and WC room, kitchen and utility room fittings specified to 'Good'	BREEAM Outstanding	3	
NOTE: 'Good' fittings are equivalent to good practice fittings with "Excellent" fittings equivalent to best practice fittings (see the technical manual for full details).				
Exemplary Credit		If the water consumption is less than 80l/person/day		Indicative Innovation Credits Achieved
Comments				Please Select
N/A. This is not in the scope of the refurbishment. However this is a minimum requirement for the VERY GOOD rating. Due this this not being within the scope of the refurbishment a VERY GOOD rating will be targeted for the development. ⇒				
Wat 02 External Water Use				
No. of BREEAM credits available	1	Available contribution to overall score	2.20%	
No. of BREEAM innovation credits	0	Minimum Standards applicable	No	
Assessment Criteria				Indicative Credits
Where the following requirements will be met:				1
Requirements:		Where a compliant rainwater collection system for external/internal irrigation use has been provided to dwellings.		
One Credit		OR Where dwellings have no individual or communal garden space.		
Comments				
The flats have no individual garden space and the residents have no access to a communal garden space.				
Wat 03 Water Meter				
No. of BREEAM credits available	1	Available contribution to overall score	2.20%	
No. of BREEAM innovation credits	0	Minimum Standards applicable	No	
Assessment Criteria				Indicative Credits
Where an appropriate water meter for measuring usage of mains potable water meter has been provided to dwelling(s), one credit may be awarded				Please Select
Comments				
N/A. This is not in the scope of the refurbishment. ⇒				

MATERIALS

Section Weighting: 8%

Indicative Section Score 5.51%

Mat 01 Environmental Impact of Materials

No. of BREEAM credits available	25	Available contribution to overall score	4.44%
No. of BREEAM innovation credits	0	Minimum Standards applicable	No

Assessment Criteria

Up to 25 credits can be awarded, with credits calculated using the Mat 01 calculator tool. The table below shows the maximum number of credits available for each element:

Indicative Credits	19
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Elements	Green Guide Rating credits available	Thermal performance credits available*
Roof	5	3
External walls	5	3.8
Internal walls (including separating walls)	5	-
Upper and Ground Floor	5	1.2
Windows	5	2

The full 25 credits represents all of the elements containing refurbished or existing materials that meet the Green Guide Rating of A+(6)

GG Rating	Points for existing / refurbished elements	Points for new elements
A+ (6)	5	
A+ (5)	4.6	
A+ (4)	4.2	
A+ (3)	3.8	
A+ (2)	3.4	
A+	3	3
A	2	2
B	1	1
C	0.5	0.5
D	0.25	0.25
E	0	0

Where the full 25 credits cannot be achieved the score can be 'topped up' with thermal performance credits. The full number of thermal performance credits for each element can be achieved when achieving the minimum U-values shown below.

Elements	Minimum U-Value (W/m ² K)
Roof	0.11
External walls	0.15
Internal walls (including separating walls)	-
Upper and Ground Floor	0.15
Windows	1.4

Comments

It has been assumed that 19 No credits will be achieved since all materials will have a green guide rating of at least A+(3) as it is stated in the Sustainability and Energy statement prepared by the M&E Consultant.

Mat 02 Responsible Sourcing of Materials

No. of BREEAM credits available	12	Available contribution to overall score	2.13%
No. of BREEAM innovation credits	0	Minimum Standards applicable	Yes

Assessment Criteria

Where new materials are responsibly sourced, up to 12 credits may be awarded where 80% of new materials for an element are responsibly sourced. The credits achieved are dependent on % of point achieved which is based upon the responsible sourcing tier level of each material sourced as detailed below:

Indicative Credits	4
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Tier level	Points
1	4
2	3.5
3	3
4	2.5
5	2
6	1.5
7	1
8	0

BREEAM credits	% of available points achieved
12	≥54%
10	≥45%
8	≥36%
6	≥27%
4	≥18%
2	≥9%

sourced in accordance with the UK Government's Timber Procurement Policy?
Yes

Comments

It has been assumed that 4 No credits will be achieved since majority of the materials used will be responsibly sourced as stated in the Sustainability and Energy statement prepared by the M&E Consultant.

Insulation

No. of BREEAM credits available	8	Available contribution to overall score	1.42%
No. of BREEAM innovation credits	0	Minimum Standards applicable	No

Assessment Criteria

Where any new insulation specified for use within external walls, ground floor, roof and buildings services meet the following requirements:

Indicative Credits	8
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Requirements
4 Credits Where the Insulation Index for new insulation used in the buildings is ≥2
Where Green Guide ratings are determined using the Green Guide to specification tool

Requirements
4 Credits Where ≥ 80% of the new thermal insulation used in the building elements is responsibly sourced.

Comments

It has been assumed that all the new insulation installed will have an insulation index of greater than 2. It is also assumed that 80% of the insulation will be responsibly sourced. (Rockwool or similar)

WASTE		Section Weighting: 3%		Indicative Section Score 1.80%	
Was 01 Household Waste					
No. of BREEAM credits available	2	Available contribution to overall score	1.20%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria				Indicative Credits	
Where compliant recycling and composting facilities are provided, up to two credits may be awarded as follows				Please Select	
First Credit - Recycling Facilities					
Scenario		Internal recycling storage requirements			
Compliant collection scheme in place		3 internal recycling containers provided where recycling is not sorted post collection			
		1 internal recycling container provided where recycling is sorted post collection			
		Minimum 30 litre total capacity, no single container less than 7 litre capacity			
No compliant collection scheme in place No adequate external storage		Dedicated position in accordance with compliance note 1			
		3 internal recycling containers provided			
		Minimum 60 litre total capacity			
No compliant collection scheme in place Adequate external storage provided		Dedicated position in accordance with compliance note 1			
		3 internal recycling containers provided			
		Minimum 30 litre total capacity, no single container smaller than 7 litre capacity			
		Dedicated position in accordance with compliance note 1			
Second credit - Composting facilities					
With external space			Without external space		
Where a composting service or facility is provided for green/garden waste			Where a composting service or facility is provided for kitchen waste		
Where a composting service or facility is provided for kitchen waste			Where an interior container is provided for kitchen composting waste of at least 7 litres		
Where an interior container is provided for kitchen composting waste of at least 7 litres					
Comments					
N/A. This is not in the scope of the refurbishment.					
Was 02 Refurbishment Site Waste Management					
No. of BREEAM credits available	3	Available contribution to overall score	1.80%		
No. of BREEAM innovation credits	1	Minimum Standards applicable	No		
Assessment Criteria				Indicative Credits	
Up to three credits are available depending on the site waste management plan to be implemented as follows				3	
Projects up to £100k					
Three Credits		Where waste generated through the refurbishment process is managed in accordance with Checklist A-9			
Exemplary Credit		Where a compliant Level 1; Site Waste Management Plan (SWMP) is in place			
Projects up to £300k					
Three Credits		Where a compliant Level 1; Site Waste Management Plan (SWMP) is in place			
Exemplary Credit		Where a compliant Level 2; Site Waste Management Plan (SWMP) is in place			
		Non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the resource efficiency benchmark			
		The percentage of non-hazardous construction waste and demolition waste generated by the project has been diverted from landfill and meets or exceeds the refurbishment & demolition waste diversion benchmarks			
Projects over £300k					
First Credit Management Plan		Where a compliant Level 2; Site Waste Management Plan (SWMP) is in place			
Second Credit Good Practice Waste Benchmarks		First credit achieved			
		Non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the resource efficiency benchmark			
		Amount of waste generated against £100,000 of project value is recorded in the SWMP			
Third Credit Best Practice Waste Benchmarks		Pre-refurbishment audit of the existing building is completed			
		If demolition is included as part of the refurbishment programme, then the audit should also cover demolition materials			
Exemplary Credit		Where the first two credits have been achieved			
		Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the refurbishment & demolition waste diversion benchmarks			
		Where non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the <i>exemplary level resource efficiency benchmark</i>			
		Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the <i>exemplary level diversion benchmarks</i>			
Comments					
The principal contractor will have in place a BREEAM compliant SWMP, where best practice waste benchmarks will be achieved. (total project cost is assumed to be lower than £300K)					
POLLUTION		Section Weighting: 6%		Indicative Section Score 2.25%	
Pol 01 NOx Emissions					
No. of BREEAM credits available	3	Available contribution to overall score	2.25%		
No. of BREEAM innovation credits	0	Minimum Standards applicable	No		
Assessment Criteria				Indicative Credits	
Credits are awarded on the basis of NOx emissions arising from the operation of space heating and hot water systems for each refurbished dwelling as follows:				Please Select	
		Dry NOx Emissions			
One Credit		≤100 mg/kWh (NOx class 4 boiler)			
Two Credits		≤70 mg/kWh (NOx class 5 boiler)			
Three Credits		≤40 mg/kWh			
Comments					
The current strategy specifies the use of Low Nox gas fired boilers. It has been assumed that the new boilers will have NOX emissions lower than 40mg/ kWh (Worcester Greenstar range or similar)					

Pol 02 Surface Water Runoff			
No. of BREEAM credits available	3	Available contribution to overall score	2.25%
No. of BREEAM innovation credits	1	Minimum Standards applicable	No
Assessment Criteria			Indicative Credits
Where impacts of the refurbishment on surface water runoff are neutralised or where runoff is reduced as a result of refurbishment, up to three credits can be awarded as follows:			1
Requirements			
First Credit Neutral Impact on Surface Water	New hard standing areas must be permeable		
	If building on to previously permeable area additional run-off must be managed on site		
	Calculations should be carried out by an appropriately qualified professional		
Requirements			
Second Credit 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		
	Include runoff from all existing and new parts of the roof.		
	An appropriately qualified professional should be used to design an appropriate drainage strategy for the site		
Requirements			
Third Credit Reducing Run-Off From Site: Advanced	Where run-off as a result of the refurbishment is managed on site using source control		
	An appropriately qualified professional should be used to design an appropriate drainage strategy for the site.		
	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%.		
Requirements			
Exemplary Credit	Where all run-off from the developed site is managed on site using source control		
	The peak rate of run-off as a result of the refurbishment for the 1 in 1 year event is reduced to zero.		
	The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event is reduced to zero.		
	There is no 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.		
Requirements			
An allowance for climate change must be included for all of the above calculations, in accordance with current best practice (PPS25, 2010).			Indicative Innovation Credits Achieved Please Select
Comments			
The refurbishment is expected to have a neutral impact on the surface water run-off. It is expected that detailed calculations will be undertaken at design stage by the Flood Risk consultant and these will be detailed with the FRA. Hence 1 No. credit has been assumed.			
Pol 03 Flooding			
No. of BREEAM credits available	2	Available contribution to overall score	1.50%
No. of BREEAM innovation credits	0	Minimum Standards applicable	Yes
Assessment Criteria			Indicative Credits
Where the dwelling is located in a low flood risk zone, or where in a medium to high flood risk zone and a flood resilience/resistance strategy has been implemented, up to two credits can be awarded as follows:			2
Minimum Standards			
A minimum of two credits must be achieved for this issue at the Excellent and Outstanding levels			
Option 1 - Low Flood Risk			
Two Credits	Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwellings are defined as having a low annual probability of flooding.		
	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.		
Option 2 - Medium / High Flood Risk			
Two Credits	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 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		
Comments			
The EA website suggests that the site lies within the Low Flood risk area. An FRA is expected to be commissioned at design stage.			