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Design Guide
BREEAM Domestic Refurbishment 2014
1 Lily Place

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Executive Summary
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Introduction:	Eight Associates have been appointed, as registered BREEAM Domestic Refurbishment assessors, to undertake an outline stage review of the likely BREEAM rating for the proposed development at 1 Lily Place. The results of this report are based on a preliminary meeting and subsequent correspondence.
Score Summary:	The proposed development reviewed currently scores a 'Good' rating, at 49.16%. The 'Good' rating called for by the London Borough of Camden requires a score of at least 45% at formal assessment; Eight Associates recommend a safety margin of between 3 to 5% to safeguard the rating at post-construction stage.
Building Summary:	The proposed development is located in the London Borough of Camden and comprises the refurbishment of an existing three storey building consisting of 8 flats, to introduce 3 new flats (by extension of the third storey and creation of a new fourth storey) and reconfigure the current top floor (third storey) flat. The property falls within the Hatton Garden Conservation Area (although it is not listed) and is therefore subject to the 'historic building' requirements under BREEAM Domestic Refurbishment for ventilation, security and sound insulation.

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Rating Summary
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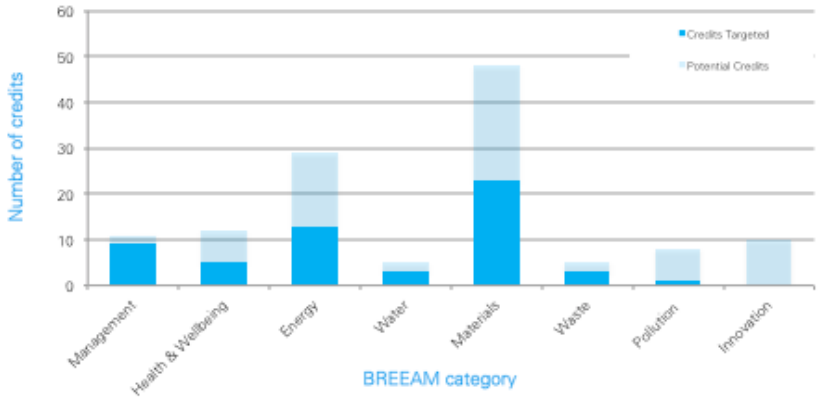
Summarised Score:

	Score	Credits available	% Achieved	Weighting Factor	Credits Score
Management	9.0	11	81.82	0.12	9.82
Health & Wellbeing	5.0	12	41.67	0.17	7.08
Energy	13.0	29	44.83	0.43	19.28
Water	3.0	5	60.00	0.11	6.60
Materials	23.0	48	47.92	0.08	3.83
Waste	3.0	5	60.00	0.03	1.80
Pollution	1.0	8	12.50	0.06	0.75
Innovation	0.0	10	0.00	0.1	0.00
				Total	**49.16**

Graphic Breakdown:

The graph below shows the credits targeted in the proposed scheme (dark blue) and the potential credits that are achievable (pale blue) under BREEAM Domestic Refurbishment. Please see the remaining portions of the report for details of credits that have been achieved.



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Scoresheet
BREEAM Domestic Refurbishment 2014
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BREEAM 2014 Domestic Refurbishment 09.11.2017 2702 1 Lily Place Preliminary Assessment			Mandatory for Good	Credits available	Targeted credits	Action credits	Comments
Management	Man 01	Home User Guide		3	3		
	Man 02	Responsible Construction Practices		2	1	1	
	Man 03	Construction Site Impacts		1	1		
	Man 04	Security		2	1	1	
	Man 05	Ecological Features		1	1		
	Man 06	Project Management		2	2		
Health and Wellbeing	Hea 01	Daylighting		2	1		
	Hea 02	Sound Insulation		4	1	1	
	Hea 03	Volatile Organic Compounds		1	1		
	Hea 04	Inclusive Design		2	0		
	Hea 05	Ventilation	1	2	1	1	
	Hea 06	Safety	1	1	1		
Energy	Ene 01	Improvement in EER		6	2.0		
	Ene 02	EER Post Refurbishment	1	4	2.0		
	Ene 03	Primary Energy Demand		7	2.0		
	Ene 04	Renewable Technologies		2	0		
	Ene 05	Energy Labelled White Goods		2	1	1	
	Ene 06	Drying Space		1	1		
	Ene 07	Lighting		2	2		
	Ene 08	Energy Display Devices		2	1		
	Ene 09	Cycle Storage		2	1	1	
	Ene 10	Home Office		1	1		
Water	Wat 01	Internal Water Use*		3	1		
	Wat 02	External Water Use		1	1		
	Wat 03	Water Meter		1	1		
Materials	Mat 01	Environmental Impact of Materials	*	25	13		
		Roof		*5*	2.0		
		External Walls		*5*	2.0		
		Internal / Separating Walls		*5*	3.0		
		Upper and Ground Floor		*5*	3.0		
		Windows		*5*	3.0		
	Mat 02	Responsible Sourcing of Materials		15	6		
	Mat 03	Insulation		8	4		
Waste	Was 01	Household Waste		2	1		
	Was 02	Refurbishment Site Waste		3	2		
Pollution	Pol 01	NO_x Emissions		3	0		
	Pol 02	Surface Water Runoff		3	1		
	Pol 03	Flooding		2	0		
Innovation	Inn 01	Exemplary Performance		10			

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Management
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Management:

The management section covers issues that aim to ensure the end user is able to operate their home efficiently and effectively as well as being able to live in a dwelling that is safe and secure. The category also covers issues relating to effective project management and sustainable site practices, and provides a framework that encourages refurbishment projects to be managed in an environmentally, socially considerate and accountable manner. This includes the following aspects during refurbishment:

- Providing a home user guide;
- Improving or implementing responsible construction practices;
- Improving construction site impacts in categories such as CO_2 production, water consumption and the sourcing of construction materials;
- Improving security on the dwelling/s to reach minimum standards;
- Protecting and enhancing the site ecology;
- Encouraging efficient project management by assigning responsibilities and project planning;
- Testing that may be required to establish any remediation that may be necessary;
- Carrying out handover and aftercare with the occupant.

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Man 01: Home User Guide

BREEAM Domestic Refurbishment 2014

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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 and how to make the best use of local facilities, in line with current good practice and in the manner envisaged by the developer.

Three of three credits are targeted.

Contents:

The following information should be included in the Home User Guide for three credits to be awarded. Please see the following pages for more detailed information of each category. Information should be grouped under the following headings:

1. About BREEAM Domestic Refurbishment;
2. Recommendations Report;
3. Energy Efficiency;
4. Water Use;
5. Transport Facilities;
6. Materials & Waste;
7. Emergency Information;
8. Local Amenities;
9. Provision of Information in Alternative Formats;
10. SuperHomes Network;
11. Links and References.

1. About BREEAM Domestic Refurbishment:

The introductory section should include the following information:

1. Background about the scheme, category areas, scoring system;
2. A copy or photocopy of the BREEAM Domestic Refurbishment certificate should also be provided with a summary of the environmental features that have been designed into the dwelling to help achieve the rating.

2. Recommendations report:

A recommendations report for how the home could be improved in the future including:

1. How to improve the home to the next BREEAM Domestic Refurbishment rating band covering each category;
2. Use of sustainable material including low VOC materials, responsible sourcing and the Green Guide;
3. Use of contractors with good green credentials including site waste management, use of considerate constructors scheme or similar and awareness of environmental impacts;
4. Sources of further guidance on how to improve the home e.g. EST, Green Deal Advisors Information on potential funding mechanisms e.g. the Green Deal, Feed in Tariffs etc.;
5. How to obtain an assessment for future refurbishment work.

Man 01: Home User Guide
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3. Energy Efficiency:

Information on energy-efficient features and strategies relating to the home, and also provide an overview of the reasons for their use, e.g. economic and environmental savings. Information could include:

1. Information on the effective operation and reason for the use (e.g. environmental economic savings) of environmental features/design strategies such as passive solar design, super insulation, energy efficient timber windows, heat recovery systems, solar hot water systems, photovoltaics, passive vents or the use of certified timber or SUDS within the boundary of the property.
2. Tips on other energy saving measures such as not leaving electrical appliances on standby etc. and the cost/environmental savings this can give.
3. Information as described in the Building Regulations ADL1b (requirement note L1c) (1) i.e. sufficient information about the building, its building services and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.
4. A way of complying would be to provide suitable set of operating and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that the home owner / tenant can understand. The instructions should be directly related to the particular system/s installed in the dwelling.
5. The instructions should explain to the occupier how to operate the system(s) efficiently. These should include: the making of seasonal adjustments to control settings and what routine maintenance is needed to enable operating efficiency to be maintained at a reasonable level through the service live/s of the system/s.
6. Details of any renewable system(s) and how it/they operate(s).
7. Details of low-energy light fittings (e.g. CFL, LED etc.), their use, their benefits and the benefits of purchasing high efficacy lamps, e.g. how much energy they save compared to traditional light fittings and what this can mean in terms of reduced energy bills and payback.
8. Details of the EU labelling scheme for white goods.

Include information on smoke detector(s). User guide in Plain English on the following technologies where included with basic user instructions labelled on equipment or controls where appropriate:

1. Boiler;
2. Air Source Heat Pump;
3. Ground Source Heat Pump;
4. Mechanical Ventilation with Heat Recovery (MVHR) Solar hot water;
5. PV;
6. CHP;
7. Smart meter / display energy device;
8. Water meter.

Man 01: Home User Guide
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4. Water Use:

Details of water saving features and their use and benefits, e.g. low/dual flush toilets, low water use showers, low water use white goods (washing machines, dishwashers etc), and tips as well as details of external water use and efficiency, e.g. the use of water butts or other type of rainwater recycling systems.

5. Transport Facilities:

Include details of resident car-parking and cycle storage provision, cycle paths in the area including, if available, cycle path network maps for the whole town/local area plus local public transport information, maps and timetables where relevant (i.e. this may not be relevant to existing occupied homes).

Information on alternative methods of transport such as park and ride, car sharing schemes and/or car pools/car hire in the area and local 'green' transport initiatives should be included. Information on the location of amenities and places of interest/cultural value, areas of outstanding natural beauty (AONB's), nature reserves, allotments etc. Also details on how to get to local amenities in the area, using public transport or cycling as relevant.

6. Materials & Waste:

1. Low energy/low water white goods;
2. Electrical equipment, including light fittings and bulbs;
3. Timber products from sustainable sources;
4. Organic food procurement/food growing/local produce/local food provision, e.g. farmers markets, organic box schemes, etc.;
5. Information on the location of recyclable materials storage areas (especially within flats) and how to use them appropriately;
6. Information on responsible purchasing of:
    a. Low energy/low water white goods
    b. Electrical equipment, including light fittings and bulbs
    c. Timber products from sustainable sources
    d. Organic food procurement/food growing/local produce/local food provision, e.g. farmers markets, organic box schemes, etc.
7. Information about the Local Authority collection scheme (if applicable).
8. If the home is not covered by a Local Authority collection scheme, details and location of recycling bins/skips/facilities.
9. Information on the location and use of any recycling and compost bins.
10. Information on Waste and Resource Action Plan (WRAP) (4), which can offer guidance on recycling and sustainable waste disposal.
11. Information on what to do with waste not covered by the standard weekly Local Authority collection scheme for example fridges/freezers, computer equipment, batteries and other potentially hazardous equipment. In some areas the local authority will collect these items. If this is the case, details and information on such a collection scheme should be provided.
12. Information and location detailing local recycling facilities and waste tips.
13. Environmental recommendations for consideration in any home improvement works, such as the use of low VOC products or the purchase of certified timber.

Man 01: Home User Guide BREEAM Domestic Refurbishment 2014 1 Lily Place

7. Emergency Information:	1. Information on smoke detector/s and carbon monoxide detectors; 2. Contact details for emergency services including the location of local minor injuries clinics, A&E departments and the nearest police/fire station.
8. Local Amenities:	The location of food shops, post boxes, postal facilities, bank/cash points, pharmacies, schools, medical centres, leisure centres, community centres, places of worship, public houses, children's play areas, outdoor open access public areas as deemed relevant occupiers. Other local amenities such as places of interest/cultural value, areas of beauty / wildlife / conservation / allotments etc. may also be included.
9. Provision of Information in Alternative Formats:	Include details of the procedure for obtaining a copy of the guide in alternative formats, including foreign languages, braille, large print or audiocassette / CD. It should include the contact details of the person/organisation responsible for producing the guide.
10. SuperHomes network:	SuperHomes is a network of over 100 energy aware households. The homeowners have refurbished their old homes to the highest standards of energy efficiency and have achieved at least 60% reduction on fossil fuel use. The homes are examples open for visits to aid other refurbishment projects. For more information about the SuperHomes network and the projects visit www.superhomes.org.uk.
11. Links & References:	This should include links to other information including websites, publications and organisations providing information on how to reduce the environmental impact in terms of transport, the use of local amenities, responsible purchasing etc. As a minimum, this should include links and address/telephone contact numbers to: 1. The Energy Saving Trust good practice guidance; 2. The Local Authority; 3. The company responsible for the refurbishment of the property; 4. The company responsible for the management of the home (where applicable); 5. Act on CO_2 (Go to www.direct.gov.uk for further information).

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Man 02: Responsible Construction Practices

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Aim:

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

One of two credits is targeted.

Credit requirements:

The principle contractor should be registered under the Considerate Constructors Scheme (CCS), achieving a CCS Code of Considerate Practice score of ≥40, with a score of at least 7 in each section.

Credits	Considerate Constructor's Scheme Score
One credit	25-34 (5 points in each section)
Two credits	35-39 (7 points in each section)
Innovation credit	>40 (7 points in each section)

Responsible construction practices:

See below an example CCS score sheet, for reference only:

Section	Score achieved	Reference
Considerate section		1
Environmentally aware section		2
Site cleanliness section		3
Good neighbour section		4
Respectful section		5
Safe section		6
Responsible section		7
Accountable section		8
Total Considerate Constructors Score		9 (sum of 1-8)
Assessor to award credits based on committed CCS Score and table below		10
Signed:	Date:	
Name [PRINT]:	Organisation:	

Score Achieved	Credits
Total CC score achieved is less than 24	0 credits
Total CC score is between 24 and 31.5	1 credit
Total CC score is between 32 and 35.5	2 credits
Total CC score is greater than 36	2 + Innovation credit

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Man 03: Construction Site Impacts

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Aim:

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

One of one credit is targeted.

Credit requirements:

Two or more of the sections A-E in the table below (referenced from the BREEAM Domestic Refurbishment Manual Checklist A-4 "Large Scale Refurbishments – Construction Site Impacts)" should be completed.

Checklist:

a) Monitor, report and set targets for CO_2 production of energy use arising from site activities		
Compliance requirement	Tick	Evidence/reference
Monthly measurements of energy use will be/has been recorded and displayed on site		
Appropriate target levels of energy consumption will be/were set and displayed (targets could be annual, monthly or project targets).		
As a minimum, monitoring will/did include checking the meters and displaying some form of graphical analysis in the site office to show consumption over the project duration and how actual consumption compares to the targets set.		
The design/site management team will/did nominate an individual who will be responsible for the monitoring and collection of data.		
Notes: - Targets for energy consumption during the refurbishment process should be set using DTI's Environmental KPI benchmarks. These documents do not specify targets but facilitate projects un setting appropriate targets. - BREEAM does not require targets to be met but is encouraging the process of setting, monitoring and reporting against targets.		

(continued overleaf…)

Man 03: Construction Site Impacts

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b) Monitor, report and set targets for water consumption arising from site activities		
Compliance requirement	Tick	Evidence/reference
Monthly measurements of water consumption will be/were recorded and displayed on site.		
Appropriate target levels of water consumption will be/were set and displayed (targets could be annual, monthly or project targets).		
As a minimum, monitoring will/did include checking the meters and displaying some form of graphical analysis in the site office to show consumption over the project duration and how actual consumption compares to targets set.		
The design/site management team will/did nominate an individual responsible for the monitoring and collection of data.		
Notes: - Targets for water consumption during the refurbishment process should be set using DTI's Environmental KPI benchmarks. These documents do not specify targets but facilitate projects in setting appropriate targets. - BREEAM does not require targets to be met but is encouraging the process of setting, monitoring and reporting targets.		

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Man 03: Construction Site Impacts

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c) A main contractor with an environmental materials policy		
Compliance requirement	Tick	Evidence/reference
The main contractor operates an environmental materials policy, used for sourcing of construction materials to be utilised on site. The policy should cover/promote the following: - Use of local materials (where possible); - Use of responsibly sourced materials; - Re-use of materials; - Use of materials with a high recycled content; - Waste minimisation and recycling; - Use of non-toxic materials and refrigerants with a high global warming potential; - Use of materials with a low embodied impact; - Use of durable materials.		
Post refurbishment: indicative examples have been provided to demonstrate the policy in action.		

d) A main contractor that operates an Environmental Management System		
Compliance requirement	Tick	Evidence/reference
The main contractor operates an Environmental Management System covering their main operations. The EMS must be either: - Third party certified, to ISO 4001/EMAS or equivalent standard, OR - The structure of the EMS is in compliance with British Standard 8555: 2003 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system' and completed phase audits one to four, as defined in BS8555.		

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Man 03: Construction Site Impacts

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e) 80% of site timber is reclaimed, re-used or responsibly sourced		
Compliance requirement	Tick	Evidence/reference
80% of timber used during construction, including formwork, site hoardings and other temporary site timber used for the purpose of facilitating construction, will be/was procured from sustainably managed sources, independently certified by one of the top two levels as set out in the Responsible Sourcing of Materials Issues (BREEAM issue Mat 02)		
Additionally 100% of all site timber will be/was legally sourced.		
Notes: - Re-used timber from off-site can be counted as equivalent but re-usable formwork only complies if it meets the above criteria. - This credit can be awarded where all the timber used is reclaimed timber.		

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Man 04: Security
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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.

One of two credits is targeted.

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1st	Retained external doors: These should be of good quality with working key locks and a strong frame, where there is no sign of warping, splitting or rotting to either the door or the frame. Where the door incorporates glazing, this should be a minimum of double-glazing. Putty or beading to glazed areas should be on the unexposed (or inaccessible) side of the door, and be in good condition with no signs of degradation. New external doors: External door sets should meet PAS 24:2007 or LPS1175 Security Rating 1 or an equivalent standard. Retained accessible windows: Windows that could feasibly be used as an entrance into the dwelling should have a minimum of double-glazing with working key locks. Putty or beading to glazed areas should be on the unexposed (or inaccessible) side of the window, and be in good condition with no signs of degradation. The window frame should be strong, with no signs of warping, splitting or rot. New windows: Windows should meet BS 7950:1997 (36) or LPS1175 Issue 7 Security Rating 1 or an equivalent standard.
2nd	A suitably qualified security consultant such as the Police Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) should be consulted at the design stage and their recommendations incorporated into the refurbishment specification. The ALO/CPDA must be satisfied that the criteria of Section 2 – Physical Security are met.

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Man 05: Ecological Features

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Aim:

To protect existing ecological features from substantial damage during refurbishment and enhance the ecological value of a site.

One of one credit is targeted.

Credit requirements:

The credit is awarded based on the following criteria:

Credits	Criteria

1	A site survey should be carried out by a suitably qualified ecologist (SQE) to determine the presence of ecological features. Where protected species (plants or wildlife) have been identified as present on site, the relevant Statutory Nature Conservation Organisation (SNCO) should be notified and the species adequately protected for the duration of refurbishment works, in line with BRE criteria.*
	
	Features of ecological value include the following:
	
	- Trees which meet one or more of the following requirements:
	  - over 100mm trunk diameter;
	  - over 10 years old;
	  - of significant ecological value.
	- Mature hedgerows over 1m tall and 0.5m wide;
	- Natural areas (e.g. flower-rich meadow/grassland and heath-land which includes habitat/plants that thrive on acidic soils, such as heather and gorse);
	- Watercourses (rivers, streams and canals);
	- Wetlands (ponds, lakes, marshland, fenland);
	- Protected Species;
	- Local Priority UK BAP species;
	- Roosting and/or nesting opportunities in buildings for bats and birds.

Inn	An innovation credit is available under issue Inn 01 (see page 62) where a Suitably Qualified Ecologist (SQE) is appointed to recommend appropriate ecological features that will positively enhance the ecology of the sit and where the developer adopts all general ecological recommendations and 30% of additional recommendations.

*Where protected species are identified as present on site, please contact the BREEAM assessor for further compliance information.

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Man 06: Project Management

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Aim:

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

Two of two credits are targeted.

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1st	The whole project team should be involved in decision-making. Roles and responsibilities should be assigned by the project manager during the following stages: - Planning and Building control notification; - Design; - Refurbishment; - Commissioning and handover; - Occupation. Key design team meetings should be held to define and make key decisions that influence/affect the dwelling's proposed designs, and their refurbishment in accordance with the design (and therefore the dwelling's sustainability impacts and BREEAM performance). These meetings may be site or office-based and would typically include representatives from at least three of the parties (below). - Representatives of the Client / Developer; - The Main Contractor; - The Architect; - Structural Engineers; - Building Services Engineers; - Cost Consultants; - Environmental Consultants; - Project Management Consultants. Team meetings must be related to the building under assessment.
2nd	Where a handover meeting is arranged and 2 or more of the following items have been committed to determine project success: - A site inspection within 3 months of occupation; - Post occupancy interviews with building occupants or a telephone/postal survey 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.

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Man 06: Project Management

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Credit requirements:

Exemplary credit requirements awarded under issue Inn 01:

Credits	Criteria
Inn 1	Where a BREEAM Accredited Professional (AP) has been appointed to oversee key stages within the project at an early stage, prior to the production of a refurbishment specification.
Inn 2	Where pre- and post-refurbishment air tightness testing and thermography surveying is carried out in accordance with the following standards: Air tightness testing: BS EN 13187 Qualitative detection of thermal irregularities in building envelopes. Infrared method or BS EN 13829:2001 Determination of air permeability of buildings ATTMA (the Air Tightness Testing and Measurement Association) Technical Standard 1. A target level for improved air tightness should be set and achieved. Thermographic survey: The thermographic surveys must ensure that all elements of the building fabric that enclose an internal heated and/or conditioned (treated) zone of the building, including internal walls separating treated and untreated zones, will be tested. The thermographic surveys of the building fabric must be undertaken in accordance with the appropriate standard and by a professional holding a valid Level 2 certificate in thermography (as defined by the UK Thermography association (UKTA) website http://www.ukta.org). The surveys should be accounted for within the project budget and programme of works. The pre-refurbishment highlights areas with poor thermal performance, which the project should prioritise for improvement and use to inform an appropriate refurbishment strategy. The post-refurbishment survey should confirm: Continuity of insulation in accordance with the construction drawings Avoidance of excessive thermal bridging Avoidance of air leakage paths through the fabric (except through intentional openings) Any defects identified via the post-refurbishment inspections are rectified. Trades onsite should be notified that these surveys are being carried out both pre and post refurbishment.

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Health and Wellbeing
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Health and Wellbeing:

The Health and Wellbeing category aims to improve the quality of life in homes by recognising refurbishments that encourage a healthy and safe internal environment for occupants in relation to the following aspects of refurbishment:

- Minimising impacts on daylighting and encouraging enhanced daylighting
- Improving sound insulation values for separating walls and floors to Part E standards and beyond
- The specification of finishes which avoid the use of Volatile Organic Compounds
- Improving accessibility to the home and allowing for future adaptability
- Providing sufficient ventilation
- Providing fire and carbon monoxide detection

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Hea 01: Daylighting
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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.

One of two credits is targeted.

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1st	One credit is achievable where refurbishment works result in a neutral impact on daylighting levels in the kitchen, living room, dining room and study, with "no" answered for each point in both questionnaires ('Daylight Factor' and 'No Sky Line') found below, and the relevant values inserted. In addition, the extension should not reduce daylighting levels in the kitchen, living room, dining room or study of neighbouring properties. Where the extension incorporates a kitchen, living room, dining room or study, the following daylighting levels should be achieved: - The kitchen should achieve a minimum daylight factor of at least 2%; - The living room, dining room and study should achieve a minimum average daylight factor of 1.5%; - 80% of the working plane in the kitchen, living room, dining room and study should receive direct light from the sky.
2nd	Where the first credit is awarded, a second credit is achievable where the following daylighting levels can be demonstrated throughout the dwelling: - The kitchen should achieve a minimum daylight factor or at least 2%; - The living room, dining room and study should achieve a minimum average daylight factor of 1.5%; - 80% of the working plane in the kitchen, living room, dining room and study should receive direct light from the sky.

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Hea 01: Daylighting
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Daylight factor questionnaire:

Item	Factor	Question	Before refurbishment	After refurbishment
1	Transmittance	Has the transmittance factor reduced as a result of refurbishment?	Transmittance factor e.g. 0.8 for clear single glazing (from BS 8206 Part 2)	Transmittance factor e.g. 0.8 for clear single glazing
2	Net Glazing area (accounting for the frame factor)	Has the net glazing area reduced by >10% as a result of refurbishment?	Net glazing area (m^2)	Net glazing area (m^2)
3	Area of Room Surface	Has the area of room surfaces increased as a result of refurbishment?	Area of room surfaces (m^2)	Area of room surfaces (m^2)
4	Reflectance	Are room finishes darker on average as a result of refurbishment	Colour of finishes (floor, walls, ceiling before)	Colour of finishes (floor, walls, ceiling after)
5	Angle of visible sky	Has the area of visible sky reduced as a result of refurbishment?	Angle of visible sky (e.g. 65°)	Angle of visible sky (e.g. 65°)

No-sky line:

Item	Factor	Question	Before refurbishment	After refurbishment
1	Height of the window head above the working plane	Has the height of the window head above the working plane reduced?	Height of the window head above the working plane (m)	Height of the window head above the working plane (m)
2	Distance from obstruction	Has the distance from obstruction reduced?	Distance from obstruction (m)	Distance from obstruction (m)
3	Height of obstruction over window head	Has the height of obstruction over window height increased?	Height of obstruction over window height (m)	Height of obstruction over window height (m)
4	Height of working plane	Has the height of working plane decreased?	Height of working plane (m)	Height of working plane (m)

eight associates

Hea 02: Sound Insulation

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To ensure the provision of acceptable sound insulation standards and so minimise the likelihood of noise complaints.

One of four credits is targeted.

Credit requirements:

As 1Lily Place is classed by the BRE as a 'historic building', credits are awarded based on the following criteria:

Credits	Criteria
1	Where pre- and post-refurbishment testing can demonstrate that the works have had a neutral effect on airborne and impact sound insulation values.
2	Where airborne sound insulation values are 3dB higher than before refurbishment, and where impact sound insulation values are 3dB lower than before refurbishment.
3	Where airborne sound insulation values are 5dB higher than before refurbishment, and where impact sound insulation values are 5dB lower than before refurbishment.
4	Where airborne sound insulation values are 8dB higher than before refurbishment, and where impact sound insulation values are 8dB lower than before refurbishment.

For attached dwellings within historic buildings, as defined by Approved Document E fulfilling the requirements of paragraph 0.8, pre-completion testing should be carried out before and after refurbishment by a Suitably Qualified Acoustician (SQA) to determine whether the sound insulation values for historic buildings have been met.

OR
Where sound testing has been carried out and where the dwelling meets or goes beyond regulations, up to four credits may be awarded according to the sound insulation credit requirements shown below:

Credits	Impact sound insulation	Airborne sound insulation
2 credits	Part E compliance	Part E compliance
3 credits	3 dB lower than Part E	3 dB higher than Part E
4 credits	5 dB lower than Part E	5 dB higher than Part E

Where the property is detached with no separating walls or floors, or where walls or floors only occur between non-habitable rooms (and where testing is not required by the building control body,) full credits are awarded by default.

(continued overleaf)

eight associates

Hea 02: Sound Insulation

BREEAM Domestic Refurbishment 2014

1 Lily Place

Credit requirements:	OR Where sound testing is not feasible, existing separating walls and floors are designed to meet the above requirements with compliant construction details, two credits can be awarded. In this case, a Suitably Qualified Acoustician (SQA) should be appointed to provide recommendations for the specification of all existing separating walls and floors, confirming in their professional opinion that they have the potential to meet or exceed the sound insulation credit requirements for historic buildings. Where these recommendations are implemented, up to four credits can be awarded.

eight associates

Hea 03: Volatile Organic Compounds

BREEAM Domestic Refurbishment 2014

1 Lily Place

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).

One of one credit is targeted.

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1	Where all decorative paints and varnishes used in refurbishment works meet the requirements outlined in the table below.

Volatile Organic Compounds:

The following table details the products, European standards and required emissions levels to achieve credits for Hea 03.

Product Requirements:

Product	European Standard	Emission level required
Decorative paints and varnishes	BS EN 13300:2001, referred to the requirements of Decorative Paint Directive 2004/42/CE	VOC (organic solvent) content (testing req. 6), requirement for Phase 2. Fungal and algal resistant.
Wood panels - Particleboard; - Fibreboard including MDF; - OSB; - Cement-bonded particleboard; - Plywood; - Solid wood panel and acoustic board.	EN 13986:2004	Formaldehyde E1 in accordance with EN 3986:2004 Annex B. Verify that regulated wood preservatives are absent, as defined by the standard.
- Glued laminated timber	EN 14080:2005	Formaldehyde E1 (Testing req. 1).
- Parquet flooring	EN 14342:2005	Formaldehyde E1 (Testing req. 1). Verify that regulated wood preservatives are absent as defined by the standard.
- Vinyl/linoleum - Cork and rubber - Carpet - Laminated wood flooring	EN 14041:2004	Formaldehyde E1 (Testing req. 1). Verify that regulated preservatives are absent as defined by the standard.

(table continued overleaf…)

eight associates

Hea 03: Volatile Organic Compounds

BREEAM Domestic Refurbishment 2014

1 Lily Place

Suspended ceiling tiles	EN 13964:2004	Formaldehyde E1 (Testing req 1). No asbestos.
Flooring adhesives (and if relevant adhesives for rigid wall coverings)	EN 13999–1:2007	Verify that carcinogenic or sensitising volatile substances are absent (Testing req. 2–4).
- Finished wallpapers - Wall vinyls and plastic wall coverings - Wallpapers for subsequent decoration. - Heavy duty wall coverings - Textile wall coverings	EN 233:1999 EN 234:1997 EN 259:2001 EN 266:1992	Formaldehyde (Testing req. 5) and vinyl chloride monomer (VCM) (testing req. 5) release should be low and within the BS EN standard for the material. Verify that the migration of heavy metals and other toxic substances are within the EN standard for the material.
Adhesive for hanging flexible wall-coverings (for rigid wall coverings use flooring adhesives criteria)	BS 3046:1981 (23)	No harmful substances and preservatives used should be of minimum toxicity.
Testing requirement: EN 717–1:2004 (25) EN 13999–2:2007—Volatile Organic Compounds (VOCs) (18) EN 13999–3:2007—Volatile aldehydes (18) EN 13999–4:2007—Volatile disocyanates (18) EN 12149:1998 (26) BS EN ISO 11890–2:2006 (27)		

eight associates

Hea 04: Inclusive Design

BREEAM Domestic Refurbishment 2014

1 Lily Place

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.

Zero of two credits are targeted.

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1	Minimum accessibility: Where the evidence demonstrates provision for minimum accessibility in line with BRE requirements, one credit can be awarded.
2	Advanced accessibility: Where evidence demonstrates provision for advanced accessibility in line with BRE requirements, two credits can be awarded.
Innovation credit	Exemplary performance requirements – Lifetime Homes and Part M One innovation credit can be awarded under the issue Inn 01, where an access expert or suitably qualified member of the design team has completed sections 1, 2 and 3 of Appendix A: Hea 04 1, access statement template with evidence provided of the measures implemented in the refurbishment.

Where these credits are eventually targeted, further compliance information should be requested from the BREEAM assessor.

eight associates

Hea 05: Ventilation
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:

MINIMUM OF ONE CREDIT REQUIRED FOR ALL BREEAM RATINGS

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.

As 1 Lily Place is a historic building, special consideration should be made to the higher levels of air infiltration needed to remove structural moisture in the absence of impermeable damp-proofing. The refurbishment should therefore be designed to meet the requirements of Part F of the Building Regulations, sections 3.11-3.16. Reference should also be made the following guidance documents:

- The guide to building services in historic buildings, CIBSE, 2002;
- BES7913: Guide to the principles of conservation in historic buildings;
- Building Regulations and Historic Buildings, English Heritage 2004;
- Guide for Practitioners, conversion of traditional buildings, application of the Scottish Building Standards, Historic Scotland, 2007.

One of two credits is targeted.

eight associates

Hea 05: Ventilation
BREEAM Domestic Refurbishment 2014
1 Lily Place

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1st	An assessment should be carried out to establish current levels of air tightness and structural moisture, prior to the specification of fabric measures and heating systems. The assessment should establish the appropriate level of ventilation for the building, based upon the following points: - The balance required to achieve a healthy, comfortable and draught-free environment whilst allowing appropriate building breath-ability in relation to structural moisture levels; - A minimum requirement of 0.4 air changes per hour (or 8 litres/second per person) should be assumed. This may be greater where the structure needs higher levels of ventilation in order to deal with structural moisture levels; - Ventilation rates are sufficient to allow structural moisture to be dealt with effectively.
2nd	Where the first credit is achieved, the following testing should also be carried out in order to further support the ventilation/air tightness strategy for the building: - Pressure testing is carried out before and after refurbishment in accordance with the appropriate standard; - Temperature and humidity is monitored before and after refurbishment.

eight associates

Hea 06: Safety
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:

MINIMUM OF ONE CREDIT REQUIRED FOR ALL BREEAM RATINGS

To reduce the risks to life, health and property resulting from fire and exposure to carbon monoxide. This credit is a minimum requirement, and must be achieved in order to achieve a BREEAM 'Good' rating.

One of one credit is targeted.

Credit requirements:

A fire and carbon monoxide detector and alarm system should be provided in accordance with the following standards:

Fire detection and alarm system:
The fire detection and alarm systems will be Grade D, Category LD3 systems, positioned in accorance with Approved Document Part B Fire Safety Volume 1 - Dwellinghouses 2006, Section 1, Paragraphs 1.11 - 1.18 and in accordance with the recommendations of BS5839-6:2004 for a category L2 system. Note that the Building Regulations requirements for new build should be adhered to, rather than those for refurbishment.

Where the project involves an electrical re-wire, smoke and heat alarms should be mains operated and conform to BS EN 14604: 2005 or BS 5446 - 2: 2003 respectively: Fire detection and fire alarm devices for dwellings, Part 1 Specification for Smoke Alarms. They should feature a standby power supply, such as a rechargable or non-rechargable battery or capacitor. Where there is a full electrical re-wire of all electricity circuitry the fire and carbon monoxide detector and alarm system must be mains wired in order to achieve this credit. Where there is a partial rewire of the circuitry and this is taking place in an area that is suitable for the position of a detection system as above, the detection equipment should be mains wired. Where applicable, the mains supply to the alarm(s) should comprise a single, independant circuit at the dwelling's main distribution board (consumer unit) or a single, regularly used local lighting circuit. In this case, there should be a means of isolating power to the alarms without isolating the lighting (see compliance letter).

Carbon monoxide detector and alarm system:
Where dwellings are supplied with mains gas, or where any other form of fossil fuel is used (e.g. coal), carbon monoxide detection systems should be supplied to meet BS EN 50291-1:2001, positioned in accordance with BS EN 50292:2002 and should carry a British or European approval mark. The power supply should conform to BS EN 50292: 2002. Where there is a full electrical re-wire of all electricity circuitry the fire and carbon monoxide detector and alarm system must be mains wired in order to achieve this credit. Where there is a partial rewire of the circuitry and this is taking place in an area that is suitable for the position of a detection system as above, the detection equipment should be mains wired.

(continued overleaf…)

Hea 06: Safety
BREEAM Domestic Refurbishment 2014
1 Lily Place

Where applicable, the mains supply to the alarm(s) should comprise a single, independent circuit at the dwelling's main distribution board (consumer unit) or a single, regularly used local lighting circuit. In this case, there should be a means of isolating power to the alarms without isolating the lighting (see compliance letter).Please note that there is a difference in the standards required for carbon monoxide alarms used as a method of fire detection and those used in the detection of faulty or inadequately ventilated gas appliances.

Combined systems:
Where smoke and carbon monoxide detectors are combined, they should meet the LPS1282 standard, in addition to all other relevant standards listed here.

eight associates

Energy
BREEAM Domestic Refurbishment 2014
1 Lily Place

Energy:

The energy category assesses measures to improve the energy efficiency of the home through refurbishment. 65% of the available score relates the energy targets, based upon SAP or the EPC. These targets bring a balanced assessment of the impact that the refurbishment has on improving the dwellings energy performance including: How much the Energy Efficiency Rating has been improved as a result of refurbishment

- The Energy Efficiency Rating that is achieved post refurbishment;
- The dwelling's energy demand post refurbishment;
- The % of the dwellings demand that is met by renewable technologies.

35% of remaining credits relate to additional measure that save energy that are not covered under SAP or measures that provide occupants with opportunities to reduce their energy use or their impact on transport energy use, thus reducing CO_2 emissions including:

- Providing energy efficient white goods;
- Providing a reduced energy means of drying clothes;
- Encouraging the provision of energy efficient lighting;
- Providing a device for occupants to monitor energy use;
- Encouraging occupants to cycle by providing adequate and secure cycle storage facilities;
- Reducing the need to commute to work by ensuring residents have the necessary space and services to be able to work from home.

eight associates

Ene 01: Improvement in EER

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To recognise and encourage a reduction in CO_2 emissions (and thereby an improvement in the Energy Efficiency Rating) through improved energy efficiency of the dwelling and its services as a result of refurbishment.

Two of six credits are targeted.

Credit requirements:

Credits are awarded based on the benchmarks in the table below. The EER is obtained from either the Energy Performance Certificate using RdSAP April 2012[1], or from full SAP 2012[2] using section 11a, box (258). The pre-refurbishment EER should be based on the existing performance of the dwelling as detailed in SAP 2012 appendix S, Reduced Data SAP for existing dwellings.

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

[1] This should be provided by an Accredited Domestic Energy Assessor

[2] This should be provided by a person registered with an accredited energy assessment scheme provider, which is licensed with the Department of Communities and Local Government to accredit competent persons to assess the CO_2 emission rate of domestic buildings for the purposes of demonstrating compliance with Building Regulations.

eight associates

Ene 02: EER Post Refurbishment

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

MINIMUM OF TWO CREDITS REQUIRED FOR BREEAM 'VERY GOOD'

To encourage high levels of Energy Efficiency in the refurbished dwellings, thus reducing CO_2 emissions, running costs and fuel poverty.

Two of four credits are targeted.

Credit requirements:

Credits are awarded based on the benchmarks in the table below.

Credits	EER Post Refurbishment	Minimum Requirements
0.5	≥50	'Pass' level requires a minimum EER of 50
1	≥55	'Good' level requires a minimum EER of 58
1.5	≥60	
2	≥65	'Very Good' level requires a minimum EER of 65
2.5	≥70	'Excellent' level requires a minimum EER of 70
3	≥75	
3.5	≥80	'Outstanding' level requires a minimum EER of 81
4	≥85	

The post-refurbishment EER should be obtained from either the Energy Performance Certificate using RdSAP April 2012[3], or from full SAP 2012[4] using section 11a, box (258).

[3] This should be provided by an Accredited Domestic Energy Assessor

[4] This should be provided by a person registered with an accredited energy assessment scheme provider, which is licensed with the Department of Communities and Local Government to accredit competent persons to assess the CO_2 emission rate of domestic buildings for the purposes of demonstrating compliance with Building Regulations.

eight associates

Ene 03: Primary Energy Demand

BREEAM Domestic Refurbishment 2014

1 Lily Place

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.

Two of seven credits are targeted.

Credit requirements:

Credits are awarded based on the benchmarks in the table below:

Credits	Primary Energy Demand Post Refurbishment (kWh/m^2/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

The post-refurbishment EER should be obtained from either the Energy Performance Certificate using RdSAP April 2012[5], or from full SAP 2012[6].

[5] This should be provided by an Accredited Domestic Energy Assessor

[6] This should be provided by a person registered with an accredited energy assessment scheme provider, which is licensed with the Department of Communities and Local Government to accredit competent persons to assess the CO_2 emission rate of domestic buildings for the purposes of demonstrating compliance with Building Regulations.

eight associates

Ene 04: Renewable Technologies

BREEAM Domestic Refurbishment 2014

1 Lily Place

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.

Zero of two credits are targeted.

Credit requirements:

Credits are awarded based on the benchmarks in the table below.

Credits	Criteria
1	One credit is achievable 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 a 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/m^2/year; b) Mid-terraces and flats: 220 kWh/m^2/year.
2	Two credits are achievable 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; - For dwellings other than mid- to high-rise flats at least 20% of each dwellings Primary Energy Demand 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/m^2/year; b) Mid-terraces and flats: 220 kWh/m^2/year.

eight associates

Ene 05: Energy Labelled White Goods

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

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

One of two credits is targeted.

Credit requirements:

Credits are awarded based on the following criteria.

Credits	Criteria
1	<u>Fridges, freezers and fridge-freezers:</u> One credit is achievable where these are recognised by the Energy Saving Trust Recommended labelling scheme, carrying the Energy Saving Trust Recommended Label or where they carry an A+ rating under the EU Energy Efficiency Labelling Scheme. OR Where no white goods are provided to the dwelling(s), but the EU Energy Efficiency Labelling Scheme Information Leaflet is provided to each dwelling.
1	<u>Washing machines, dishwashers, tumble dryers and washer-dryers:</u> Where the above has been complied with, an additional credit is achievable where: - Washing machines are recognised by the Energy Saving Trust Recommended labelling scheme, carrying the Energy Saving Trust Recommended Label or are A++ rated under the EU Energy Efficiency Labelling Scheme. - Dishwashers are recognised by the Energy Saving Trust Recommended labelling scheme, carrying the Energy Saving Trust Recommended Label or are A+ rated under the EU Energy Efficiency Labelling Scheme. - Washer-dryers and tumble dryers are A rated under the EU Energy Efficiency Labelling Scheme (where a washer-dryer is provided, it is not necessary to also provide a washing machine). OR Where a washer-dryer or tumble dryer is not provided, the EU Energy Efficiency Labelling Scheme Information Leaflet is provided to each dwelling.

eight associates

Ene 06: Drying Space
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:

To provide a reduced energy means of drying clothes and so encourage reductions in energy demands.

One of one credit is targeted.

Credit requirements:

One credit is achievable where a drying line is provided in an adequate, secure internal or external space with posts and footings, or fixings holding drying line of the following lengths:

- 1-2 bedroom dwellings: ≥4m;
- 3+ bedroom dwellings: ≥6m.

Where located internally, this should be in either a heated space with adequate ventilation, complying with Part F of the Building Regulations (usually a bathroom or utility room), or an unheated outbuilding. For the latter, calculations by an appropriate chartered engineer (CIBSE or equivalent) should demonstrate that ventilation in the space is adequate to allow drying in normal climatic conditions and to prevent condensation/mould growth. The fixing/fitting should be a permanent feature of the room. Internal drying spaces in the following rooms do not comply:

- Living rooms;
- Kitchens;
- Dining rooms;
- Main halls;
- Bedrooms.

Where located externally, the space should be enclosed and only accessible to the residents of the dwellings. The types of external spaces that may comply include a secure:

- Private or communal garden;
- Balcony (which is openable at least on the whole front side);
- Roof terrace.

eight associates

Ene 07: Lighting
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:

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

Two of two credits are targeted.

Credit requirements:

Credits are awarded based on the following criteria. Please see Appendix 06 for relevant definitions.

Credits	Criteria
1	External lighting: Where the following is provided: Energy Efficient Space Lighting provided by dedicated energy efficient fittings, controlled by manual switching. In addition, Energy Efficient Security Lighting is provided OR Where Energy Efficient Space lighting and no Security Lighting is provided.
1	Internal lighting: An additional credit is achievable 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/m^2.

Energy Efficient Space Lighting:
Any lighting more than 45 lumens per circuit watt.

Energy Efficient Security Lighting:
This includes burglar security lights, which have a maximum wattage of 150W, with movement detection control devices (PIR) and daylight cut-off sensors or other security lighting which has energy efficient fittings and is fitted with daylight cut off sensors or timers. These should meet the requirements of the standards applicable for CIBSE LG9, and should not compromise the safety of any persons using the building – see further guidance below.

Internal Lighting:
All lighting in habitable rooms including: Living rooms, dining rooms, kitchens, bedrooms, hallways, studies, bathrooms, WC's and utility rooms.
The following rooms/areas must be excluded: Garages, walk-in wardrobes, cupboards, external areas –see further guidance below.

eight associates

Ene 07: Lighting
BREEAM Domestic Refurbishment 2014
1 Lily Place

Definitions:

General space lighting:

Lighting for external doors, porch, steps/pathways, patio, garage, garden, carports and any other outbuildings provided by energy efficient fittings, controlled by manual switching.

Space lighting in communal areas:

- Lighting in lobbies, main external entrances, internal entrance porches, external steps and pathways equipped with dedicated fluorescent fittings (or other efficient luminaries like SON or metal halide) and controlled by a time clock or daylight sensor.
- Lighting in hallways, landings, stairwells, internal corridors and garages equipped with dedicated fluorescent fittings that are controlled by push-button time switches/PIR sensors or equivalent.
- Lighting in communal rooms (laundries, cycle and other storage spaces etc.) equipped with dedicated fluorescent fittings and manual switching or occupant sensors.

Energy efficient security lighting:

- Security lighting, which are fittings designated for energy efficiency and are adequately controlled such that:
- Burglar security lights have a maximum wattage of 150W, movement detection control devices (PIR) and daylight cut-off sensors.
- Other security lighting, which has dedicated energy efficient fittings and is fitted with daylight cut-off sensors or timers.
- Lighting design for the affected areas should follow the requirements of the standard(s) applicable or CIBSE LG9, and should not compromise the safety of any persons using the building.

Control systems:

A method for controlling the external lighting to ensure that it will not operate unnecessarily during daylight hours or when a space is unoccupied. Control systems that can be considered are Passive Infra Red (PIR), 'Dusk to Dawn' daylight sensors and time switches.

Daylight sensors (dusk to dawn):

A type of sensor that detects daylight and switches lighting on at dusk and off at dawn.

eight associates

Ene 07: Lighting
BREEAM Domestic Refurbishment 2014
1 Lily Place

Definitions:

Internal lamps:

Internal lamps includes all lighting in habitable rooms including: Living rooms, dining rooms, kitchens, bedrooms, hallways, studies, bathrooms, WC's and utility rooms. The following rooms/areas must be excluded: Garages, walk-in wardrobes, cupboards, external areas.

Metal halide lamps:

A type of high intensity discharge lamp. They can be specified in varied environments. These lamps combine good colour rendering with high luminous efficacy and long life.

Movement detecting devices (PIR):

A type of motion detector that uses infra red radiation to detect movement and switches lighting on.

Pin-based compact fluorescent lamp (CFL):

A type of fluorescent lamp that fits into a dedicated lighting fixture. CFL's have a longer rated life and use less electricity than conventional incandescent light bulbs. Conventional Bayonet or Screw (Edison) fitting CFLs do not meet the requirements of this BREEAM issue.

Security lighting

Lighting provided to deter burglars or intruders and protect property. There are two types of security lighting commonly used in dwellings – high wattage intruder lights that are operated via PIR sensors which only switch on for a short time, and low wattage lighting that is controlled by time switches and daylight sensors.

High-pressure sodium lamp (SON or HPS):

A type of high intensity discharge lamp primarily used for street lighting purposes. These lamps have a very good luminous efficacy (up to 150 lumens per circuit Watt).

eight associates

Ene 07: Lighting
BREEAM Domestic Refurbishment 2014
1 Lily Place

Definitions:

Space lighting:

The normal lighting required to illuminate a space when in use. It can be used outside the entrance to the home, in outbuildings such as garages and external spaces such as paths, patios, decks, porches, steps and verandas. Space lighting should be designed as to be switched off when the space is uninhabited and during daylight hours. It is acceptable that some lighting remains switched on outside of daylight hours for safety reasons. Situations where this may be acceptable include: main external entrances, external steps, pathways and car parks.

Statutory safety lighting:

Lighting usually provided in multi-residential buildings, such as blocks of flats, to illuminate stairwells and exit routes when the main lighting system fails. Its design is specified by regulations (BS 5266) and is therefore outside the scope of BREEAM.

Time switch:

A switch with an inbuilt clock, which will allow lighting to be switched on and off at programmed times.

Tubular fluorescent and compact fluorescent lamps (TFL/CFL):

Types of fluorescent lamp that are named after their shape. These lamps have a longer rated life and use less electricity that conventional incandescent light bulbs.

Total floor area:

The total floor area (TFA) should be calculated as detailed in SAP 2009 or RdSAP April 2012. This can be found on the Energy Performance Certificate.

eight associates

Ene 08: Energy Display Devices

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To encourage the provision of accessible equipment to display energy consumption data to dwelling occupants, thereby encouraging them to reduce energy use.

One of two credits are targeted.

Credit requirements:

Credits are awarded based on the criteria in the table below.

Credits	Criteria
1	Where current electricity consumption data is displayed to occupants by a compliant energy display device fixed within each unit. OR Where current primary heating fuel consumption data is displayed to occupants by a compliant energy display device fixed within each unit.
2	Where current electricity AND primary heating fuel consumption data are displayed to occupants by a compliant energy display device fixed within each unit. OR Where electricity is the primary heating fuel, and electricity consumption data is displayed to occupants by a compliant energy display device fixed within each unit.
Inn	An Innovation credit is also available where devices are installed that meet the above requirements, and are also capable of recording and displaying historic consumption data.

Device specification:
Devices are compliant where they comprise a self-charging sensor(s) fixed to the incoming mains supply/supplies, to measure and transmit energy consumption data to a visual display unit. The visual display unit must be capable of displaying energy consumption data as follows:

- Local time;
- Current (real time) energy consumption (kW and kWh);
- Current (real time) estimated emissions (g or kg of CO_2);
- Current (real time) tariff;
- Current (real time) cost (per hour);
- Visual presentation of data (i.e. non-numeric) to allow consumers to easily identify high and low level of usage.

eight associates

Ene 09: Cycle Storage
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:

To encourage occupants to cycle by providing adequate and secure cycle storage facilities, thus reducing the need for short car journeys.

One of two credits is targeted.

Credit requirements:

Credits are awarded based on the criteria in the table below:

Credits	Criteria
1	Where individual or communal compliant cycle storage is provided for the following number of cycles: a) Studios and 1 bedroom dwellings – storage for 1 cycle for every 2 dwellings; b) 2 and 3 bedroom dwellings – storage for 1 cycle per dwelling; c) 4 bedrooms and above – storage for 2 cycles per dwelling.
2	Where individual or communal compliant cycle storage is provided for the following number of cycles: a) Studios or 1 bedroom dwellings – storage for 1 cycle per dwelling; b) 2 and 3 bedroom dwellings – storage for 2 cycles per dwelling; c) 4 bedrooms and above – storage for 4 cycles per dwelling.

Where cycle storage space is to be located externally:

- Cycles can be secured within spaces in rack(s) or fixtures to allow cycles to be free-standing and locked;
- The rack(s) consists of fixings for one or more spaces;
- The space is covered overhead to protect from the weather;
- The covered area and the cycle racks or fixings are set in or fixed to a permanent structure (building or hard-standing);
- Alternatively the cycle storage may be located in a locked structure fixed to or part of a permanent structure;
- The distance between each cycle rack, and cycle racks and other obstructions (e.g. a wall), allows for appropriate access to the cycle storage space, to enable bikes to be easily stored and accessed including 1m^2 space for tools, where cycles are to be stored in a shed;
- Communal cycle storage is located within 100m of each dwellings main entrance (ideally within 50m), or within 100m of the main communal entrance in the case of flats.

eight associates

Ene 09: Cycle Storage
BREEAM Domestic Refurbishment 2014
1 Lily Place

Credit requirements (continued):

Where cycle storage space is to be located internally:

- The space should be of adequate size within a dedicated storage space such as a dedicated space within a hallway, adequately sized cupboard or other suitable space with adequate fixtures allowing the cycles to be freestanding;
- The space should be on the ground floor of the dwelling;
- It should not be in a lounge/living room, bedroom, bathroom, dining room or kitchen;
- It must be possible to access the space without going through the lounge/living room, bedrooms (where located on the ground floor), dining room, bathroom or kitchen;
- There should be adequate access to allow the cycle to be moved in and out of the dwelling taking account of the minimum width needed for a person pushing a bicycle (1.10m width), and 2.0m bike length for manoeuvring the cycle round corners;
- The storage space should not impede the intended use of that room.

Access to cycle storage through the dwelling:

Where the cycle storage is located at the rear of the property and there is no right of way to the rear of the property without going through the dwelling, this is acceptable, providing the following are met:

Access through the property to the cycle storage can be gained without going through the lounge/living room, bed- rooms (where located on the ground floor) dining room, bathroom or kitchen;
There is adequate access to allow the cycle to be moved in and out of the dwelling taking account of the minimum width needed for a person pushing a bicycle (1.10m width), accounting for furniture and 2.0m bike length for manoeuvring the cycle round corners.

Communal cycle storage:

Where the dwelling is provided with communal compliant cycle storage, the number of cycle storage spaces can be provided on a sliding scale. Firstly calculate the total number of cycle storage spaces required according to the credit criteria. Next calculate the number of spaces required as follows:

- First 50 cycles spaces: 100% provision
- Next 50 cycles spaces: 50% provision
- Subsequent spaces, where more than 100 spaces are required: 25% of additional spaces required

eight associates

Ene 09: Cycle Storage
BREEAM Domestic Refurbishment 2014
1 Lily Place

Credit requirements (continued):

For example, where 200 spaces are required:

- First 50 cycle spaces: 100% of cycle spaces (50 spaces)
- 50 – 100 cycle spaces: 50% of cycle spaces (25 spaces)
- 100 additional cycle spaces: 25% of cycle spaces (25 spaces)

Total number of spaces required = 100

Note: where the above requirements cannot be met due to constraints with the existing site, and it can be demonstrated that reasonable provision has been made to meet these requirements as far as possible, there may be flexibility on the above requirements. Such cases should contact BRE Global for further advice.

Provision of folding cycles:

The provision of folding cycles stored within or outside the dwelling, would not achieve the credit. Folding cycles would be a temporary provision whereas the provision of cycle storage is a permanent feature for use by current and future occupants.

Storage systems:

The use of proprietary (manufactured) cycle storage systems is acceptable where it can be demonstrated that the installation will provide sufficient access to allow cycles to be moved in and out independently.

eight associates

Ene 10: Home Office
BREEAM Domestic Refurbishment 2014
1 Lily Place

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.

One of one credit is targeted.

Credit requirements:

One credit is achievable where sufficient space and services have been provided to allow the occupants to set up a home office in a suitable room with sufficient space, sufficient services and adequate ventilation.

Suitable Room:

This is defined as a room other than the kitchen, living room, master bedroom or bathroom. It must be large enough so that the setting up of an office will allow the intended use of that room; for example, if a bedroom is used there must be sufficient remaining space for a bed and other necessary furnishings. For studio homes, where the living room and / or kitchen forms part of the same room as the master bedroom, the home office is allowed to be in this space.

Sufficient Space:

A clear wall space of at least 1.8m should be provided to allow a desk, chair and filing cabinet/bookshelf to be installed. There should be space to move around the front and side of the desk, to use the chair appropriately and to operate the filing cabinet (if present) safely.

Sufficient Services:

The space designated for the home office should feature the followng:

- Two double power sockets
- A telephone point
- A window, of which with the width or height should be no less than 450mm
- Adequate ventilation: The window should have an openable casement of 0.5m^2, or the room should feature an alternative means of ventilation such as passive stack. The achievement of at least one credit under Hea 05 will demonstrate compliance. Please note, a room with only an external door will not meet the requirements for adequate ventilation.

eight associates

Water
BREEAM Domestic Refurbishment 2014
1 Lily Place

Water:

The water category is focused on identifying means of reducing water consumption in the home including internal water use and external water use. The assessment covers all sanitary fittings in the home and the targets provide recognition for both small changes in the home (e.g. installing a low flow shower) all the way up to a complete replacement of sanitary fittings. Where sanitary fittings are replaced (e.g. a new bathroom), credits can be gained through use of fittings that meet the appropriate fittings standards, or through use of the water calculator. The water calculator looks at the impact that a fitting has on reducing water use, indicating whether a target has been met and the number of credits that can be awarded (subject to the provision of appropriate evidence).
An additional credit is also available for reducing outdoor water use, through the specification of a water butt or a similar device to collect rainwater rather than use mains potable water. Whilst all these measures are designed to reduce water use, it is up to the occupants to use water appropriately therefore an additional credit is gained for providing a water meter, to let occupants monitor their water use. Overall, the following aspects are covered in the water category:

- Fitting low use water fittings for sanitary applications
- Providing a water collection system for external water use
- Providing water-metering systems including smart water meters or AMRs.

eight associates

Wat 01: Internal Water Use

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

MINIMUM OF ONE CREDIT REQUIRED FOR BREEAM 'VERY GOOD'

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

One of three credits is targeted.

Credit requirements:

For this credit, one credit must be obtained in order for a BREEAM 'Very Good' rating to be achievable. The following water fitting specifications will demonstrate compliance:

Showers:
All showers should have a flow rate of no more than 12 litres per minute. This should be measurable at full flow, at the outlet using water at a temperature of no more than 30 degrees Celsius, at a dynamic pressure of 3±0.2 bar (0.3±0.02 MPa) for high pressure (Type 1) supply systems, or at a dynamic pressure of 0.1±0.05 bar (0.01±0.005 MPa) for low pressure (Type 2) supply systems.

Taps:
All taps (apart from bath taps) should have a flow rate of no more than 5 litres per minute. This should be measurable at the outlet, at full flow rate at a dynamic pressure of 3±0.2 bar (0.3±0.02 MPa) for high pressure (Type 1) taps, or at a dynamic pressure of 0.1±0.02 bar (0.01±0.002 MPa) for low pressure (Type 2) taps, including any reductions achieved with flow restrictions.

WCs:
All WCs should feature 6/4 litre dual flush mechanisms.

Washing machines:
These should consume no more than 7 litres per kilogram of dry load capacity.

Dishwashers:
These should have a consumption of no more than 1 litre per place setting.

Waste disposal units:
It is assumed that waste disposal units have not been specified.

Water softeners:
It is assumed that water softeners have not been specified.

Daily water consumption:
The calculated water consumption should be less than 140 litres/person/day; this figure will be determined by the BREEAM assessor, using the BREEAM Domestic Refurbishment Wat1 calculator and information provided by the design team.

eight associates

Wat 02: External Water Use

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To encourage the recycling of rainwater and reduce the amount of mains potable water used for external irrigation / cleaning etc.

One of one credit is targeted.

Credit requirements:

One credit is achievable where a compliant rainwater collection system for the purpose of external/internal irrigation has been provided for unit with an external space. The collection system should meet the following criteria:

- The system should have a capacity of no less than 200 litres;
- There should be no open access at the top of the collector (a childproof lid is allowed);
- The system should be connected to the rainwater downpipe, and feature an automatic overflow into the conventional rainwater drainage system;
- There should be a means of detaching the rainwater downpipe, with access provided to enable cleaning of the interior;
- Where the collection system is to be sited outside and not buried, it must be stable and adequately supported;
- The material used for the container should be durable and opaque to sunlight;
- Where the system is part of a rainwater collection system providing internal water, water for external use may be provided in a separate tank to water required for internal water. This could be an overflow pipe leading from the main tank to a compliant water butt for external water use.
- Where large water-using features such as pools or hot tubs (or any notifiable under the Water Supply (Water Fittings) Regulations 1991 (SI 1999/1148)) are present, these should be fed by appropriately treated water from 100% rainwater or 100% greywater only. This excludes the water required for the first fill, which can be sourced from mains potable water. Credits can only be awarded where these, and all other criteria for this issue are met.

The meter should measure continuously, memorise and display the volume of water consumption passing through it. The following should be included:

- Measurement transducer;
- Calculator (including adjustor or correction device if needed);
- Indicating device.

eight associates

Wat 03: Water Meter
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:	To encourage the provision of equipment to measure water consumption of dwelling occupants, thereby encouraging them to reduce water use. *One of one credit is targeted.*
Credit requirements:	The credit is achievable where an appropriate water meter for measuring usage of mains potable water has been provided to the dwelling in accordance with the following criteria: - The meter should provide a visible display of mains potable water consumption to occupants; - It should be a permanent feature, secured within the home in a location visible to occupants (i.e. not hidden within a cupboard); - It should be capable of recording and displaying historic water consumption to allow water consumption to be monitored over time; - It should be capable of displaying current consumption either instantaneously or at half hourly intervals.

eight associates

Materials
BREEAM Domestic Refurbishment 2014
1 Lily Place

Materials:

The materials category focuses on the procurement of materials that are sourced in a responsible way and have a low embodied impact over their life including how they have been extracted and manufactured. Overall it aims to encourage the retention of existing materials and where new materials are procured that they have they the lowest environmental impact and the greatest potential impact on reducing the dwellings operational energy demand including the following aspects during refurbishment:

- Using thermal insulation which has a low embodied environmental impact relative to its thermal properties
- Sourcing responsible sourced materials with appropriate certification e.g. FSC, ISO14001 etc. Sourcing materials with a high Green Guide rating

eight associates

Mat 01: Environmental Impact of Materials

BREEAM Domestic Refurbishment 2014

1 Lily Place

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.

Thirteen of twenty-five credits are targeted.

Credit requirements:

Credits are awarded according to the impact of new materials on the basis of their Green Guide Rating and their impact on improving the thermal performance of the dwelling. Up to 25 credits are achievable through a combination of the following

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

*Thermal performance credits are only available to retained elements undergoing refurbishment, to recognise thermal improvements made to existing retained elements. U-values should be based on the data shown in section 3 of the SAP assessment used for Ene 01, Ene 02 and Ene 03. If RdSAP was used, the U-values should be provided by theAccredited Domestic Energy Assessor.

Retained elements:
Where elements are retained with no work being carried out on them, they are assessed against the Refurbishment Green Guide Calculator. Typically they will be counted as being very low impact. A maximum of 5 credits are available, with elements rated from A+ to E.

Retained elements undergoing refurbishment:
Where works are being carried out to existing elements (such as the installation of solid wall insulation), these are also assessed against the Refurbishment Green Guide Calculator. A maximum of 5 credits are available for refurbished elements depending on their Refurbishment Green Guide rating from A+ to E.

New elements:
Where any of the above elements are newly constructed/installed, they 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:
Additional credits are achievable where the refurbishment of elements result in an improvement in their thermal transmittance values. These are calculated based upon the U-value of elements before and after refurbishment.

eight associates

Mat 02: Responsible Sourcing of Materials

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To recognise and encourage the reuse of materials and the specification of responsibly sourced materials for use where required in the refurbishment process. Efforts should be made to reuse materials where feasible, and where required new materials should be responsibly sourced. Minimum standards apply to new timber, which must be sourced in accordance with the UK Government's timber procurement policy. As a basic rule, all timber used both on site and in construction should be FSC / PEFC certified, all concrete BES 6001 certified and all other materials sourced from organisations with an environmental management system such as ISO 14001.

Six of fifteen credits are targeted.

Credit requirements:

Pre-requisite:
All timber and timber-based products must be legally harvested and traded, as outlined in the Central Point of Expertise on Timber (CPET), 5th Edition report on the UK Government Timber Procurement Policy.

Sustainable Procurement Plan:
Three credits are available where the principal contractor sources materials for the project in accordance with a documented sustainable procurement plan, setting out a clear framework for the responsible sourcing of materials. The plan should cover the following as a minimum:

1. Risks and opportunities are identified against a broad range of social, environmental and economic issues. BS 8902:2009 Responsible sourcing sector certification schemes for construction products- Specification can be used as a guide to identify these issues.
2. Aims, objectives and targets to guide sustainable procurement activities.
3. The strategic assessment of sustainably sourced materials available locally and nationally. There should be a policy to procure materials locally where possible.
4. Procedures are in place to check and verify that the sustainable procurement plan is being implemented/adhered to on individual projects. These could include setting out measurement criteria, methodology and performance indicators to assess progress and demonstrate success.

Responsible Sourcing of Materials:
Up to 12 credits are then available for this issue, which are determined by the BREEAM Assessor using the Mat 02 calculator tool. Where new applicable building materials are specified, the following refurbished building elements will be included in the assessment:

(continued overleaf…)

eight associates

Mat 02: Responsible Sourcing of Materials

BREEAM Domestic Refurbishment 2014

1 Lily Place

Building elements:

- External wall;
- External wall finishes;
- Roof (structure);
- Roof (finishes);
- Upper floors;
- Floor (structure);
- Flooring finishes;
- Internal walls (structure);
- Internal walls (finishes);
- Ceiling (structure);
- Ceiling (finishes);
- Doors / windows;
- Staircase / ramps;
- Building services;
- Hard landscaping;
- Other.

Where they form any part of any building element listed above, the following materials will be assessed:

Applicable materials:

- Timber / timber based products;
- Concrete / cementious materials (plaster, mortar, screed etc.);
- Metal;
- Stone / aggregate;
- Clay-based (pavers, blocks, bricks, roof tiles etc.);
- Gypsum;
- Glass;
- Plastic, polymer, resin, paint, chemicals and bituminous;
- Animal fibre / skin, cellulose fibre;
- Other.

The following materials are excluded:

- Insulation materials;
- Fixings (such as screws, nails, brackets etc.);
- Adhesives;
- Additives.

eight associates

Mat 02: Responsible Sourcing of Materials

BREEAM Domestic Refurbishment 2014

1 Lily Place

Credit requirements (continued):

Materials with responsible sourcing certifications are assigned a tier level and a subsequent number of points. The following certification schemes qualify for credits under BREEAM Domestic Refurbishment:

Certification schemes:

- Re-used materials;
- BRE Global BES6001;
- CARES Sustainable Construction Steel (SCS) Scheme;
- Eco-Reinforcement;
- Timber and timber-based products:
- Forest Stewardship Council (FSC);
- Programme for the Endorsement of Forest Certification (PEFC)
- Sustainable Forestry Initiative;
- Environmental Management System (EMS) ISO14001 for both key process and supply chain extraction process;
- Environmental Management System (EMS) ISO14001 for key processes only.

eight associates

Mat 03: Insulation
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim

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

Four of eight credits are targeted.

Credit requirements

Prerequisite:

Any new insulation specified for use within the following building elements must be assessed;

- External walls;
- Ground floor;
- Roof;
- Building services.

Up to 8 credits are achievable, based on the following critera:

Credits	Criteria
4	Embodied Impact: 1. Where the insulation index for new insulation used in the buildings is ≥2 and is calculated by the BREEAM Assessor using the Mat 03 Insulation Calculator. 2. Where Green Guide ratings, required by the Mat 03 Insulation Calculator are determined using the Green Guide to specification tool.
4	Responsible Sourcing: Where ≥80% of the new thermal insulation used in the building elements is responsibly sourced.

Achieving compliance:
Specifications that will achieve an insulation index of ≥2 are those where all insulation materials have a Green Guide rating of A or A+. Where there is a mixture of materials, at least 67% of the area-weighted thermal resistance should have a rating of A+. Specifications that will not achieve an insulation index of ≥2 are those comprising an insulation material with a Green Guide rating of B, C, D, or E, or a mixture of materials with Green Guide ratings of A, B, C, D or E.

Where a mixture of materials is used with Green Guide ratings of A+, A, B, C, D or E with different area weightings and / or thermal conductivities, the Mat 03 calculator can be used to assess the available credits for this issue.

eight associates

Waste
BREEAM Domestic Refurbishment 2014
1 Lily Place

Waste	The waste category covers issues that aim to reduce the waste arising from refurbishment work and from the operation of the home, encouraging waste to be diverted from landfill including the following: - Providing recycling storage facilities - Providing composting facilities - Implementing a site wide waste management plan (SWMP) to reduce refurbishment waste

eight associates

Was 01: Household Waste

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To recognise and encourage the provision of dedicated storage facilities for a dwelling's recyclable or compostable waste streams, so that waste is diverted from landfill or incineration.

One of two credits is targeted.

Credit requirements:

Credits are awarded based on the following criteria:

Credits	Criteria
1	Recycling facility: As the City of Westminster sort recycling post-collection, a single recycling container should be provided alongside the container for non-recyclable waste. This should be fixed in a dedicated, unobtrusive position in a cupboard either in the kitchen, adjacent or close to the non-recyclable waste bin, or located adjacent (within 10m) to the kitchen in a utility room, storage room or connected garage. The container should have a capacity of no less than 30 litres.
1	Composting facility: Westminster City Council do not operate a compliant kitchen or garden waste collection service, so in order to achieve the extra credit, this should take the form of a fixture (such as a composting bin), located within 30 metres of an entrance door to the dwelling, as well as an interior container located in the kitchen for the collection of compostable waste. The bin should have a capacity of no less than 7 litres, and be fixed in a dedicated position within the kitchen. A home composting information leaflet should also be provided, which can form a part of the Home Users Guide (see Man 01). The leaflet should include the following information: - How composting works and why it is important; - The materials that can be composted (e.g. raw vegetable peelings and fruit, shredded paper, teabags etc.); - If a communal composting scheme is in place in the locality, details of the operation and management of this scheme should also be included.

eight associates

Was 02: Refurbishment Site Waste

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To promote resource efficiency via the effective management and reduction of waste related to the refurbishment process.

Two of three credits are targeted.

Credit requirements:

The project value is over £300,000; in which case credits are awarded based on the following criteria:

1st credit: Site Waste Management Plan:
A compliant Level 2 Site Waste Management Plan should be implemented by the principle contractor and should meet the following requirements:

- A target benchmark for resource efficiency, i.e. m^3 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 the benchmark and best practice;
- Specify waste minimisation actions relating to at least 3 key waste groups (according to the European Waste Catalogue – see Appendix 1) and recording decisions taken;
- Procedures for minimising hazardous waste;
- Procedures for sorting, reusing and recycling construction and demolition waste (where generated) either on-site or through a licensed external contractor, according to the waste streams generated by the scope of works;
- Procedures for measuring the amount of construction and demolition waste (where generated) diverted from landfill;
- License 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.

2nd credit: good practice waste benchmarks:
NB: the first credit must be achieved before targeting the second credit.

- Where non-hazardous demolition waste generated by the dwelling's refurbishment meets or comes below the target of 26.52 m^3 (16.9 tonnes) of waste generated per £100,000 of project value. This figure refers to actual volume of waste rather than bulk volume.
- Where the amount of waste generated per £100,000 of project value is recorded in the SWMP.
- Where a pre-refurbishment audit of the existing building is carried out using an appropriate methodology such as those conducted by the BRE's Smartwaste team.
- Where the demolition is included, as part of the refurbishment programme, then the audit should also cover demolition materials.

eight associates

Was 02: Refurbishment Site Waste

BREEAM Domestic Refurbishment 2014

1 Lily Place

Credit requirements (continued):

3rd credit: best practice waste benchmarks:
NB: the first two credits must be achieved before targeting the third credit.

Non-hazardous demolition waste generated by the dwelling's refurbishment meets or exceeds the refurbishment & demolition waste diversion benchmarks in accordance with the following targets:

- 70% of the total volume of non-hazardous construction waste is diverted from landfill.
- 80% of the total volume of non-hazardous demolition waste is diverted from landfill.

Innovation credit: exemplary level waste benchmarks:
NB: the first three credits must be achieved before targeting the Innovation credit.

Achievable where non-hazardous construction waste generated by the dwelling's refurbishment meets or exceeds the exemplary level resource efficiency benchmarks as follows:

Amount of non-hazardous construction waste generated per £100,000 of project value	
m^3	Tonnes
17.32	8.78

Note – volume (m^3) is the actual volume of waste, not bulk volume.

Also where non-hazardous demolition waste generated by the dwelling's refurbishment meets or exceeds the exemplary level benchmarks as follows:

Waste types	Volume	Tonnes
Non-hazardous construction waste	80%	85%
Non-hazardous demolition waste	85%	95%

eight associates

Pollution
BREEAM Domestic Refurbishment 2014
1 Lily Place

Pollution:

The pollution category covers issues that aim to reduce the homes impact on pollution as well as reducing risk from flooding. This includes the following aspects being considered during refurbishment:

- The use of low NOx space heating and hot water systems;
- Having a neutral impact on runoff or reducing or eliminating runoff from the dwelling as a result of refurbishment;
- Providing flood resistance and resilience strategies, where dwellings are in a medium or high flood risk zone;
- Rewarding dwellings, which are located in a low flood risk zone.

eight associates

Pol 01: Nitrogen Oxide Emissions

BREEAM Domestic Refurbishment 2014

1 Lily Place

Aim:

To reduce the emission of nitrogen oxides (NO_X) into the atmosphere.

Zero of three credits are targeted.

Credit requirements:

Credits are awarded on the basis of NO_X emissions arising from the operation of space heating and hot water systems for the refurbished dwelling as follows:

Credits	Criteria
1	Where the dry NO_X emissions of space heating and hot water systems are $\leq$100 mg/kWh, by way of an NO_X class 4 boiler.
2	Where the dry NO_X emissions of space heating and hot water systems are $\leq$70 mg/kWh, by way of an NOX class 5 boiler.
3	Where the dry NO_X emissions of space heating and hot water systems are $\leq$40 mg/kWh.

Information on the boiler's NO_X emissions is generally provided in the manufacturer's information; conversion calculations must be carried out where the dry emissions are given in units other than mg/kWh. Systems which typically meet the requirements of this issue are those where the boilers are new or a recent installation (i.e. the last 10 years) such as:

- Gas heating and hot water;
- Gas heating and hot water with solar thermal;
- Gas heating and hot water with secondary heating less than 8% of the combined heating and hot water demand;
- Where all space heating and hot water energy requirements are fully met by systems that do not produce NO_X emissions, three credits can be awarded.

Systems that will typically not meet the requirements of this issue are:

- Grid-powered air-source and ground-source heat pumps – due to the use of grid electricity, unless combined with solar PV, where average NOX emission calculations may demonstrate a lower NOX level. These will contribute towards achieving credits in the energy category however;
- Biomass boilers;
- Electric heating systems including direct heaters and storage heaters;
- Oil heating systems.

eight associates

Pol 02: Surface Water Runoff

BREEAM Domestic Refurbishment 2014

1 Lily Place

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.

One of three credits is targeted.

Credit requirements:

Credits are awarded based on the following criteria:

1st credit: neutral impact on surface water

- Where any new hard standing areas are permeable, this must include all new pavements, driveways 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 into soft landscaped areas) the additional run-off for rainfall depths up to 5mm 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; a professional with the skills and experience to champion the use of SuDS within the overall design of the development at an early stage. Suitable professionals may be found in a variety of disciplines, such as engineering, landscape design or hydrology.

2nd credit: reducing runoff from site (basic)

- Where the above criteria have been achieved;
- Where all runoff from the roof for rainfall depths up to 5mm have been managed on site suing source control methods such as infiltration or soakaways. This should include runoff from all existing and new parts of the roof;
- Where required, an appropriately qualified professional should be used to design an appropriate strategy for the site, ensuring criterion 1 is achieved.

3rd credit: reducing runoff 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, meeting the following requirements:
  - The peak rate of runoff 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 runoff is 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%;
  - An allowance for climate change must be included for all of the above calculations, in accordance with the current best practice (PPS25, 2010).

(continued overleaf)

eight associates

Pol 02: Surface Water Runoff

BREEAM Domestic Refurbishment 2014

1 Lily Place

Credit requirements:	Innovation credit: - Where all run-off from the developed site is managed onsite using source control. The following must be achieved to confirm compliance: - Where the peak rate of run-off as a result of the refurbishment for the 1 in 1 year event is reduced to zero. - Where the peak rate of run-off as a result of the refurbishment for the 1 in 100 year event is reduced to zero. - Where 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. - Where an allowance for climate change is included for all of the above calculations, in accordance with current best practice (PPS25, 2010). - Where an appropriately qualified professional has been employed to provide the above calculations and design an appropriate drainage strategy for the site, ensuring all above criteria are achieved.

eight associates

Pol 03: Flooding
BREEAM Domestic Refurbishment 2014
1 Lily Place

Aim:

MINIMUM OF TWO CREDITS REQUIRED FOR BREEAM 'EXCELLENT' AND 'OUTSTANDING' RATINGS

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.

Zero of two credits are targeted.

Credit requirements:

Low flood risk:

Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwelling is located in an area defined as having a low annual probability of flooding, two credits are achievable. For large-scale refurbishments (i.e. those with a total internal floor area of $\geq$10,000m^2, the FRA should assess the risk of the site flooding and the impact any changes or development on the site will have on flood risk on the site and elsewhere. The FRA must be prepared according to good practice guidance as outlined in PPS25 Development and Flood Risk: Practice Guide, available at www.communities.gov.uk.

For refurbishment projects of less than 10,000m^2 internal floor area, the level of detail required in an acceptable FRA will depend on the size and density of the build. This will range from a brief report for small, low density developments, to a more detailed assessment for a high density development of 2,000 – 10,000m^2. For example, for very small developments of $\geq$2000m^2 or less, an acceptable FRA could be a brief report carried out by the contractor's engineer, including information obtained from:

- The Environment Agency;
- Water company / sewerage undertaker;
- Other relevant statutory authorities;
- Site investigation (including basic surveys looking at the topography of the site)
- Local knowledge (including speaking to people who have lived in the area for a long time).

Medium or 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 achievable where, as a result of the dwelling's floor level or measures to keep water away, the dwelling is defined as achieving avoidance from flooding;
- Where avoidance is not possible, two credits are achievable where a full flood resilience/resistance strategy is implemented for the dwellings in accordance with recommendations made by a suitably qualified building professional.

eight associates

Innovation
BREEAM Domestic Refurbishment 2014
1 Lily Place

Summary:

The innovation category provides opportunities for exemplary performance and innovation to be recognised that are not included with, or go beyond the requirements of the credit criteria. This includes exemplary performance credits, for where the refurbishment meets the exemplary performance levels of a particular issue. It also includes innovative products and processes for which an innovation credit can be claimed, where they have been approved by BRE Global.

Zero of ten credits are targeted.

eight associates

Appendix 01: Waste Groups

BREEAM Domestic Refurbishment 2014

1 Lily Place

Key waste groups common to refurbishment

European Waste Catalogue (EWC)	Key Group	Examples
17 04 07 17 04 01 17 04 02 17 04 03 17 04 04 17 04 05 17 04 06	Mixed metals and categories: Copper, bronze, brass Aluminium, Lead, Zinc, Iron and Steel, Tin	Radiators, cables, wires, bars, sheet
17 06 04	Insulation	Glass fibre, mineral wool, foamed plastic
17 08 02	Gypsum	Plasterboard, render, plaster, cement, fibre cement sheets, mortar
Most relevant EWC	Hazardous	Defined in the Hazardous Waste List (HWL) of the European Waste Catalogue (EWC)
17 09 04 (Mixed)	Mixed	Efforts should be made to categorise waste into the above categories wherever possible
20 03 07	Furniture	Tables, chairs, desks, sofas
Most relevant EWC under Chapter 15	Packaging	Paint pots, pallets, cardboard, cable drums, wrapping bands, polythene sheets
Most relevant EWC under Chapter 16	Electrical and electronic equipment	Electrical and electronic equipment, TVs, fridges, air conditioning units, lamps.
Most relevant EWC	Floor coverings (soft)	Carpets, vinyl flooring
Most relevant EWC	Architectural features	Roof tiles, reclaimed bricks, fireplaces

(continued overleaf)

eight associates

Appendix 01: Waste Groups

BREEAM Domestic Refurbishment 2014

1 Lily Place

Other groups

European Waste Catalogue (EWC)	Key Group	Examples
20 03 01	Mixed municipal waste	Office waste, canteen waste, vegetation
Most relevant EWC	Oils	Hydraulic oil, engine oil, lubricating oil
Most relevant EWC	Liquids	Non-hazardous paints, thinners, timber treatments