Scott White and Hookins

BREEAM Domestic Refurbishment

THE ENVIRONMENTAL RATING FOR HOMES

PRE-ASSESSMENT

INCLUDING ANY ASSUMPTIONS AND BASIS FOR DATA

for 19-21 Great Queen Street, London

Issue Date: 24/07/2014

Rev 1.0

BRE reference no: SCHEME NOT REGISTERED

INTRODUCTION

This document was commissioned by Krishan Pattni of Latis Ltd and written by Ronald Chan of Scott White and Hookins LLP. It should be read in conjunction with the "BREEAM Domestic Rating Sheet", included at the rear of this report. There are 5 units being assessed in this scheme.

This report reviews the current standing of this scheme, employing verbal and available design information. Information is not available to enable a 'final' assessment to be undertaken.

Following this report (and where issued by Scott White and Hookins LLP), it will be the project team's responsibility to ensure that the drawings and specifications follow and clearly state the requirements for the relevant BREEAM issues . Information should then be submitted to the BREEAM assessor for the Final assessment to be made. Please note that without the evidence the assessor cannot award the credits. Reference should be made to BREEAM Domestic Refurbishment Guidance Criteria provided by Scott White and Hookins LLP's assessor.

Project:	**19-21 Great Queen Street, London**
Scheme:	**BREEAM Domestic Refurbishment**
Stage:	**Pre-assessment**
Current Targeted Rating Total:	**70.78%**
Equating to BREEAM (Provided all "minimum standard" issues are met):	**EXCELLENT**
Date:	**25/07/2014**

BREEAM Score	
PASS	≥30%
GOOD	≥45%
VERY GOOD	≥55%
Excellent	≥70%
Outstanding	≥85%

EXECUTIVE SUMMARY

BREEAM Domestic Refurbishment assesses the environmental quality of a development by considering the broad concerns of climate change, use of resources, pollution, and impacts on bio-diversity. These concerns are balanced against their need for a high quality internal environment. The rating pass marks are 30% (Pass), 45% (Good), 55% (Very Good), 70% (Excellent) and 85% (Outstanding), but these can only be applied after all categories have been sub-totalled into their overall 'Issue' categories. At such time scores are 'weighted' and the final marks then calculated.

The Preliminary rating for this scheme is estimated as achieving the Target Rating but only if the issues awarded with credits are implemented in full.

The Project Team should check and confirm the data and assumptions contained within this report at the earliest opportunity. This will aid the timely and accurate submission of data for the Final BREEAM Assessment.

The project team should ensure that the drawings and specifications follow AND clearly state ALL the relevant BREEAM issues for each of the applicable credits. Please note that for the FINAL BREEAM Assessment, without the evidence, the assessor cannot award the credits for such certificated assessment. Once the relevant BREEAM issues are integrated in the design, ALL compliant data (auditable proof, as described in the BREEAM Guidance) should then be submitted to the BREEAM Assessor for the Final report to be made. Once this report is finished it can be submitted to the BRE for QA and Certification, as necessary.

ISSUE	CRITERIA (Please refer to the BREEAM Domestic Refurbishment Manual for **FULL** criteria,)	CREDIT AVAILABLE	CREDIT TARGETED	Comments
Management				
Man 01 Home Users Guide	**Three credits** (All or nothing) Provision of a home users guide: Where a Home User Guide containing the information listed in **Appendix Man 01** 'User Guide Contents List' has been produced and supplied to all homes.	**3**	**3**	Three credits assumed
Man 02 Responsible Construction Practices	**Large Scale Project - Option 1** **One Credit - CCS score of 25 -34 OR Compliance with the alternative compliant scheme** **Two Credits - CCS score of 35-39 OR Beyond compliance with the alternative compliant scheme** **Innovation Credit - CCS score of 40 OR Exemplary level compliance with the alternative compliant scheme** **Note: CCS = Considerate Constructors Scheme**	**2**	**2**	Two credits assumed.
Man 03 Construction Site Impacts	**One credit: Large Scale Projects** Where there is evidence to demonstrate that 2 or more of the sections a-e in **Appendix Man 03** (Checklist A-4); Large Scale Refurbishments are completed	**1**	**1**	One credit assumed.

Man 04 Security	**First Credit – secure windows and doors** 1. Where retained external doors and accessible windows comply with the minimum security requirements as set out below: **External doors** are of good quality with working key locks and a strong frame, where there is no sign of warping, splitting or rotting to the door or its frame. Where the door contains glazing this should be a minimum of double glazing. Putty or beading to glazed areas should be on the unexposed side of the door, in good condition, with no sign of degradation. **Accessible Windows** should have a minimum of double glazing with working key locks. Putty or beading to glazed areas should be on the unexposed side of the window, in good condition, with no sign of degradation. The window frame should be strong with no sign of warping, splitting or rot. 2. Where the following newly added features are appropriately certified: **External Door** sets: PAS 24:2007 or LPS 1175 Issue 7 Security Rating 1 or equivalent **Windows** are certified to: BS 7950:1997 (36) LPS 1175 Issue 7 Security Rating 1 or equivalent	**2**	**1**	Secured by design credit assumed.
	Second Credit – Secured by design 3. Where the principles and guidance of Secured by Design Section 2 – Physical Security are complied with. 4. A suitably qualified security consultant such as the Police Architectural Liaison Officer (ALO) or Crime prevention design advisor (CPDA) is consulted at the design stage and their recommendations are incorporated into the refurbishment specification.			

Man 05 Protection and Enhancement of Ecological Features	**One Credit** - Protecting ecological features 1. Where a site survey is carried out by a member of the project team or a Suitably Qualified Ecologist (SQE) to determine the presence of ecological features. 2. Where protected species have been identified as present on site, the relevant Statutory Nature Conservation Organisation (SNCO) has been notified and protected species have been adequately protected 3. Where all existing features of ecological value (including any of those listed in CN1) on the refurbishment site potentially affected by the works, are maintained and adequately protected during refurbishment works. The presence of the following ecological features must be determined in the in the site survey: • Trees which met 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	**1**	**1**	One credit assumed. Exemplary requirements will also be met.
	Exemplary performance requirements – ecological enhancement The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: 4. Where a Suitably Qualified Ecologist has been appointed to recommend appropriate ecological features that will positively enhance the ecology of the site and where the developer adopts all general ecological recommendations and 30% of additional recommendations.			

Man 06 Project Management	**First credit - Project Roles and Responsibilities** 1. Where all of the project team are involved in the project decision making and individual and shared roles and responsibilities are assigned in accordance:: a. For small scale projects, the project manager writes a project implementation plan and holds an initiation meeting to assign individual and shared responsibilities amongst the project team including all trades on site: b. For large scale projects, the project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: i. Planning and Building control notification ii. Design iii. Refurbishment iv. Commissioning and handover v. Occupation	**2**	**2**	Two credits assumed.
	Second credit - Handover and Aftercare 2. Where a handover meeting is arranged 3. Where 2 or more of items a-c have been committed to determine project success: a. A site inspection within 3 months of occupation. b. Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation. c. Longer term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of occupation.			
	Exemplary Credit requirements Up to two innovation credits are available as follows: **One credit – Early Design Input** 4. 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. Or 5. for small scale projects where a BREEAM Accredited Professional (AP) or BREEAM Domestic Refurbishment Assessor has been appointed to oversee key stages within the project at an early stage, prior to the production of a refurbishment specification. Note: The appointment of a BREEAM Domestic Refurbishment Assessor early in the project may be the most appropriate option for small scale projects where the appointment of an AP (accredited professional) may not always be feasible.			
	One credit - Thermographic Surveying and Airtightness Testing 6. Where Thermographic surveying and Airtightness testing have been carried out at both pre and post refurbishment stages. 7. Where an improved air tightness target has been set at design stage and testing demonstrates that this has been achieved post refurbishment.			

Health and Wellbeing				
Hea 01 Daylighting	**First credit—maintaining good daylighting** 1. For existing dwellings and change of use projects (e.g. conversions): a. The refurbishment results in a neutral impact on the dwellings daylighting levels in the kit-chen, living room, dining room and study with “no” answered for all questions in **Appendix A**: Hea 01 , parts 1 and 2 (for existing dwellings) or parts 3 and 4 (for change of use e.g. conversions). 2. Where the property is being extended: a. new spaces achieve minimum daylighting levels b. the extension does not significantly reduce daylighting levels in the kitchen, living room, dining room or study of neighbouring properties.	**2**	**1**	One credit assumed.
	Second credit—minimum daylighting Existing dwellings and dwellings created from a change of use (i.e. conversions): One credit is awarded where the dwelling achieves the following daylighting criteria: 1. Where kitchens achieve a minimum daylight factor of at least 2% 2. Where living rooms, dining rooms and studies achieve a minimum average daylight factor of at least 1.5% 3. Where 80% of the working plan in the kitchen, living room, dining room and study, receives direct light from the sky			

<table>
<tr>
<td>Hea 02 Sound Insulation</td>
<td>
Properties where sound testing has been carried out:
1. 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 as shown below:

<table>
<tr><th>Credits</th><th>England & Wales</th><th>Scotland</th><th>Northern Ireland</th></tr>
<tr><td colspan="4">Airborne sound insulation values</td></tr>
<tr><td>2 Credit</td><td>Part E compliance</td><td>Section 5 compliance</td><td>Part G compliance</td></tr>
<tr><td>3 Credits</td><td>3dB higher than Part E</td><td>3dB higher than Section 5</td><td>3dB higher than Part G</td></tr>
<tr><td>4 Credits</td><td>5dB higher than Part E</td><td>5dB higher than Section 5</td><td>5dB higher than Part G</td></tr>
</table>

<table>
<tr><td colspan="4">Impact sound insulation values</td></tr>
<tr><th>Credits</th><th>England & Wales</th><th>Scotland</th><th>Northern Ireland</th></tr>
<tr><td>2 Credit</td><td>Part E compliance</td><td>Section 5compliance</td><td>Part G compliance</td></tr>
<tr><td>3 Credits</td><td>3dB lower than Part E</td><td>3dB lower than Section 5</td><td>3dB lower than Part G</td></tr>
<tr><td>4 Credits</td><td>5dB lower than Part E</td><td>5dB lower than Section 5</td><td>5dB lower than Part G</td></tr>
</table>

Suitably Qualified Acoustician (SQA): An individual who holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics. Due to the level of competence required to ensure adequate level of sound insulation, for the purpose of this issue, it is necessary to consult with a suitably qualified acoustician in order to achieve more than one credit (except for detached dwellings and dwellings with separating walls and floors between non habitable rooms). This may not be feasible for all refurbishment projects however this is to ensure that investment made in achieving more advanced sound insulation is based on sound advice due to the specialist nature of improving sound insulation within existing buildings.
</td>
<td>4</td>
<td>4</td>
<td>5dB better than BR will be aimed for.

Four credits assumed.</td>
</tr>
</table>

Hea 03 Volatile Organic Compounds	**One credit—avoiding the use of VOCs** 1. Where all decorative paints and varnishes used in the refurbishment have met the requirement in the table below. 2. Where at least five of the eight remaining product categories listed have met the testing require-ments and emission levels for Volatile Organic Compound (VOC) emissions against the relevant standards identified in the table below. 3. Where five or less products are specified within the refurbishment, all must meet the requirements in the table below in order to achieve this credit.			**1**	**1**	One credit assumed.

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 (see also compliance notes) Verify that regulated wood preservatives are absent as defined by the standard.
Timber Structures • Glued laminated timber	EN 14080:2005	Formaldehyde E1 (Testing req 1)
Wood flooring • parquet flooring	EN 14342:2005	Formaldehyde E1 (Testing req. 1) Verify that regulated wood preservatives are absent as defined by the standard.
Wood flooring • parquet flooring	EN 14342:2005	Formaldehyde E1 (Testing req. 1) Verify that regulated wood preservatives are absent as defined by the standard.
Resilient, textile and laminated Floor coverings • 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.

	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)		
	Wall-coverings • Finished wall-papers • Wall vinyls and plastic wall-cov-erings • Wallpapers for subsequent dec-oration. • Heavy duty wall-coverings • Textile wall-cov-erings	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	No harmful substances and preservatives used should be of minimum toxicity.		
	Testing requirement: 1. EN 717–1:2004 2. EN 13999–2:2007—Volatile Organic Compounds (VOCs) 3. EN 13999–3:2007—Volatile aldehydes 4. EN 13999–4:2007—Volatile diisocyanates				

Hea 04 Inclusive Design	**One credit—minimum accessibility** 1. An access expert or suitably qualified member of the design team has completed section 1 of Appendix Hea 04 , accessibility template with evidence provided of the measures implemented in the refurbishment a. The access statement demonstrates reasonable provision to provide accessibility to the dwelling covering section 1 of Appendix Hea 04.	**2**	**1**	One credit assumed.
	Two credits—advanced accessibility 2. An access expert or suitably qualified member of the design team (CN6) has completed sections 1 and 2 of Appendix Hea 04 with evidence provided of the measures implemented in the refurbishment a. The access statement demonstrates reasonable provision to provide accessibility to the dwelling covering sections 1 and 2 of Appendix Hea 04.			
	Exemplary performance requirements—lifetime homes and Part M The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: 3.One innovation credit can be awarded where an access expert suitably qualified member of the design team (CN6) has completed sections 1, 2 and 3 of Appendix Hea 04 , access statement template with evidence provided of the measures implemented in the refurbishment a. The access statement demonstrates reasonable provision to meet sections 1, 2 and 3 of Appendix Hea 04.			
Hea 05 Ventilation	**One credit—minimum ventilation requirements** One credit can be awarded where the following whole dwelling is brought up to the following ventilation requirements: 1. A minimum level of background ventilation is provided (with trickle ventilators or other means of ventilation) for all habitable rooms, kitchens, utility rooms and bathrooms compliant with section 7, Building Regulations Approved Document Part F, 2010 2. A minimum level of extract ventilation is provided in all wet rooms (e.g. kitchen, utility and bath-rooms), compliant with section 5, Building Regulations Approved Document Part F 2010. 3. A minimum level of purge ventilation is provided in all habitable rooms and wet rooms, compli-ant with section 7, Building Regulations Approved Document Part F, 2010.	**2**	**2**	Two credits assumed.
	Two credits—advanced ventilation Two credits can be awarded where: Ventilation is provided for the dwelling that meets the requirements of Section 5 of Building Regulations Part F in full.			

Hea 06 Safety	**One Credit—fire and carbon monoxide (CO) detection and alarm systems**	**1**	**1**	One credit assumed.
	1.0Where the dwelling is provided with a compliant fire detection and alarm system in accordance with relevant compliance notes 2-9 in Appendix Hea 06.			
	2. Where the dwelling is supplied with mains gas or where any other form of fossil fuel is used within the building (e.g. coal), a compliant carbon monoxide detector and alarm system is provided in accordance with relevant compliance notes 2-9 in Appendix Hea 06.			
	3. Where the project involves electrical re-wiring the power supply for the smoke alarm and compliant carbon monoxide alarm systems are derived from the dwellings main electricity supply in accordance with CN5 in Appendix Hea 06 . Please see CN9 Appendix Hea 06 for compliance where properties are undertaking electrical rewiring.			
	4. Where the project does not involve electrical re-wiring the power supply for the smoke alarm and carbon monoxide alarm systems are derived from a battery supply.			

<table>
<tr><td colspan="5">Energy</td></tr>
<tr><td>Ene 01
Improvement in Energy Efficiency Rating</td><td>Where the following targets are met for the improvement in Energy Efficiency Rating achieved as a result of refurbishment:

a. Determine the dwellings Energy Efficiency Rating (EER) before refurbishment
b. Determine the dwellings EER after refurbishment (preferably) from full SAP or where not available from the dwellings EPC report
c. Obtain a copy of the BREEAM Domestic Refurbishment Energy Calculator

<table><tr><th>Improvement in EER</th><th>Credits</th></tr><tr><td>≥ 5</td><td>0.5</td></tr><tr><td>≥ 9</td><td>1</td></tr><tr><td>≥ 13</td><td>1.5</td></tr><tr><td>≥ 17</td><td>2</td></tr><tr><td>≥ 21</td><td>2.5</td></tr><tr><td>≥ 26</td><td>3</td></tr><tr><td>≥ 31</td><td>3.5</td></tr><tr><td>≥ 36</td><td>4</td></tr><tr><td>≥ 42</td><td>4.5</td></tr><tr><td>≥ 48</td><td>5</td></tr><tr><td>≥ 54</td><td>5.5</td></tr><tr><td>≥ 60</td><td>6</td></tr></table></td><td>6</td><td>1</td><td>One credit assumed at this stage, subject to SAP calculation result.</td></tr>
</table>

<table>
<tr>
<td>Ene 02 Energy Efficiency Rating Post Refurbishment</td>
<td>Where the following Energy Efficiency Rating benchmarks will be met as a result of refurbishment:
• Determine the dwellings Energy Efficiency Rating (EER) post refurbishment
<table>
<tr><th>EER post refurbishment</th><th>Credits</th><th>Minimum requirements</th></tr>
<tr><td>≥50</td><td>0.5</td><td>'Pass' level EER of 50</td></tr>
<tr><td>≥55</td><td>1</td><td>'Good' level EER of 58</td></tr>
<tr><td>≥60</td><td>1.5</td><td></td></tr>
<tr><td>≥65</td><td>2</td><td>'Very Good level' EER of 65</td></tr>
<tr><td>≥70</td><td>2.5</td><td>'Excellent' level EER of 70</td></tr>
<tr><td>≥75</td><td>3</td><td></td></tr>
<tr><td>≥80</td><td>3.5</td><td>'Outstanding' level EER of 81</td></tr>
<tr><td>≥85</td><td>4</td><td></td></tr>
</table>
<table>
<tr><th>Exemplary</th><th>Credits</th></tr>
<tr><td>≥90</td><td>1</td></tr>
<tr><td>≥100</td><td>2</td></tr>
</table>
</td>
<td>4</td>
<td>1</td>
<td>Energy Efficiency Rating is the same as the SAP rating.

One credit assumed, subject to SAP calculation result.</td>
</tr>
</table>

<table>
<tr>
<td>Ene 03 Primary Energy Demand</td>
<td>Where the following Primary Energy Demand benchmarks will be met as a result of refurbishment:

Determine the dwellings Primary Energy Demand (kWh/m2/year) post refurbishment from SAP or RdSAP.

<table>
<tr><th>Primary Energy Demand Post Refurbishment (kWh/m2/year)</th><th>Credits</th></tr>
<tr><td>≤ 400</td><td>0.5</td></tr>
<tr><td>≤ 370</td><td>1</td></tr>
<tr><td>≤ 340</td><td>1.5</td></tr>
<tr><td>≤ 320</td><td>2</td></tr>
<tr><td>≤ 300</td><td>2.5</td></tr>
<tr><td>≤ 280</td><td>3</td></tr>
<tr><td>≤ 260</td><td>3.5</td></tr>
<tr><td>≤ 240</td><td>4</td></tr>
<tr><td>≤ 220</td><td>4.5</td></tr>
<tr><td>≤ 200</td><td>5</td></tr>
<tr><td>≤ 180</td><td>5.5</td></tr>
<tr><td>≤ 160</td><td>6</td></tr>
<tr><td>≤ 140</td><td>6.5</td></tr>
<tr><td>≤ 120</td><td>7</td></tr>
</table>
</td>
<td>7</td>
<td>3</td>
<td>Three credits assumed, subject to SAP calculation result.</td>
</tr>
<tr>
<td>Ene 04 Renewable Technologies</td>
<td>Where the dwelling will meet the following % contribution from renewables and primary energy demand targets as a result of refurbishment
<table>
<tr><th rowspan="2">Dwelling Type</th><th rowspan="2">Primary Energy Demand</th><th colspan="2">Percentage from Renewables</th></tr>
<tr><th>1 Credits</th><th>2 Credits</th></tr>
<tr><td>Detached</td><td rowspan="4">≤ 250 kWh/m2/year</td><td>≥10%</td><td>≥20%</td></tr>
<tr><td>Semi-Detached</td><td>≥10%</td><td>≥20%</td></tr>
<tr><td>Bungalow</td><td>≥10%</td><td>≥20%</td></tr>
<tr><td>End of Terrace</td><td>≥10%</td><td>≥20%</td></tr>
<tr><td>Mid Terrace</td><td rowspan="4">≤ 220 kWh/m2/year</td><td>≥10%</td><td>≥20%</td></tr>
<tr><td>Low Rise Flat</td><td>≥10%</td><td>≥20%</td></tr>
<tr><td>Mid Rise Flat</td><td>≥10%</td><td>≥15%</td></tr>
<tr><td>High Rise Flat</td><td>≥10%</td><td>≥15%</td></tr>
</table>
</td>
<td>2</td>
<td>2</td>
<td>Two credits assumed subject to feasibility study.</td>
</tr>
</table>

<table>
<tr>
<td>Ene 05 Energy Labelled White Goods</td>
<td>
Where Energy Efficiency White goods are to be provided as follows:
<table>
<tr><th colspan="3">First Credit</th></tr>
<tr><th>Appliance</th><th>Appliance provided</th><th>Appliance not to be provided</th></tr>
<tr><td>Fridges, Freezers and Fridge-Freezers</td><td>Energy Saving Trust Recommended appliances specified</td><td>EU Energy Efficiency Labelling Scheme Information Leaflet provided to all dwellings</td></tr>
</table>
<table>
<tr><th colspan="3">Second Credit</th></tr>
<tr><th>Appliance</th><th>Appliance provided</th><th>Appliance not to be provided</th></tr>
<tr><td>Washing Machines and Dishwashers</td><td>Energy Saving Trust Recommended appliances specified</td><td>Second credit not achieved</td></tr>
<tr><td>Washer-Dryers and Tumble Dryers</td><td>Appliances specified with B Rating under EU Energy Efficiency Labelling Scheme</td><td>EU Energy Efficiency Labelling Scheme Information Leaflet provided to all dwellings</td></tr>
</table>
</td>
<td>2</td>
<td>2</td>
<td>One credit assumed.</td>
</tr>
<tr>
<td>Ene 06 Drying Space</td>
<td>
An adequate, secure internal or external space with posts and footings, or fixings holding
<table>
<tr><th colspan="2">1 Credit</th></tr>
<tr><th>Number of bedrooms</th><th>Drying line required</th></tr>
<tr><td>1-2</td><td>4m+</td></tr>
<tr><td>3+</td><td>6m+</td></tr>
</table>
Adequate internal space:
This is either; a heated space with adequate, controlled ventilation, complying with Building Regulations Approved Document F Ventilation 2006 (rooms that commonly meet these requirements are a bathroom or utility room), or an unheated outbuilding, where calculations by an appropriate Chartered Institute of Building Services Engineer (CIBSE or equivalent professional) demonstrate that ventilation in the space is adequate to allow drying in normal climatic conditions and to prevent condensation/mould growth. The fixing/fitting needs to 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
Adequate external space:
This should be an enclosed space 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
</td>
<td>1</td>
<td>1</td>
<td>One credit assumed.</td>
</tr>
</table>

<table>
<tr>
<td>Ene 07 Lighting</td>
<td>
One credit – External lighting
1. Where Energy Efficient Space lighting (including lighting in communal areas) and Energy Efficient Security lighting is provided OR
2. Where Energy Efficient Space lighting (including lighting in communal areas) and no Security Light-ing is provided

One credit - Internal Lighting
3. One credit is awarded where the energy required for internal lighting is minimised through the provision of a maximum average wattage across the total floor area of the dwelling of 9 watts/m2
</td>
<td>2</td>
<td>2</td>
<td>Two credits assumed.</td>
</tr>
<tr>
<td>Ene 08 Energy Display Devices</td>
<td>
Where consumption data is displayed to occupants by a compliant energy display device

<table>
<tr><th rowspan="2">Electricity usage data displayed</th><th colspan="2">Primary Heating Fuel</th></tr>
<tr><th>Electricity</th><th>Other</th></tr>
<tr><td>Electricity usage data displayed</td><td>2 credits awarded</td><td>1 credit awarded</td></tr>
<tr><td>Primary Heating Fuel usage data displayed</td><td>N/A</td><td>1 credit awarded</td></tr>
<tr><td>Electricity & Primary Heating Fuel usage displayed</td><td>N/A</td><td>2 credits awarded</td></tr>
</table>

<table>
<tr><td>Exemplary Credits</td><td></td></tr>
<tr><td>One credit
Recording consumption data</td><td>Where any compliant Energy Display Device is capable of recording consumption data</td></tr>
</table>

Compliant Energy Display Devices:
A system comprising 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.

To obtain the exemplary credit, any energy display device installed in the dwelling must be capable of recording and storing energy consumption data. The consumption data that the device should be capable of displaying in order to achieve any credits is as follows:
• Current energy consumption (Watts)
• Current emissions (kg CO2)
• Current cost (£ per hour)
• Projected cost (£ per month and £ per year).
</td>
<td>2</td>
<td>2</td>
<td>Two credits assumed.</td>
</tr>
</table>

Ene 09 Cycle Storage	Where individual or communal compliant cycle storage is provided as follows: **Dwelling Size** / One Credit / Two Credits **Studios/ 1 bedroom** / 1 per two dwellings / 1 per dwelling **2-3 bedrooms** / 1 per dwelling / 2 per dwelling **4 bedrooms** / 2 per dwelling / 4 per dwelling **Compliant cycle storage:** • The space is covered overhead to protect from the weather • 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 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 1m2 space for tools, where cycles are to be stored in a shed. • Communal cycle storage is located within 100m of each dwell-ings main entrance (ideally within 50m), or within 100m of the main communal entrance in the case of flats Where due to site constraints, the above distance requirements for communal cycle storage cannot be met and an alternative solution is proposed in order to provide reasonable provision, exceptions may be allowed. Full details should be provided to BRE Global. **Cycle storage within the dwelling:** Cycle storage can be provided within the dwelling, provided the space is: • 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 • on the ground floor of the dwelling • not in a lounge/living room, bedroom, bathroom, dining room or kitchen • accessed 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), and 2.0m bike length for manoeuvring the cycle round corners. The storage space should not impede the intended use of that room. **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	**2**	**2**	Two credits assumed.

Ene 10 Home Office	**One Credit:** Where sufficient space and services have been provided which allow the occupants to set up a home office in a suitable room with adequate ventilation. **Suitable Room:** For dwellings with three or more bedrooms, a suitable room is defined as a room other than the kitchen, living room, master bedroom or bathroom. For dwellings with one or two bedrooms or studio homes, a suitable room is defined as a room other than the kitchen, living room or bathroom, however may be within the master bedroom. In all cases, the room must be large enough to allow the intended use of that room, e.g. if a home office is to be set up in the main bedroom, that room also needs to be able to fit in a double bed and other necessary furnishing. **Sufficient services:** The following services must be provided in the suitable room intended as a home office: • Two double power sockets • Telephone point • Window (either of the width and height are to be less than 450mm) • Adequate ventilation **Sufficient space:** A minimum size space should be provided (1.8m wall length) to allow a desk, chair and filing cabinet or bookshelf to be installed, with space to move around the front and side of the desk, use the chair appropriately and operate the filing cabinet safely (the 1.8m wall size requirement can, in some circumstances, be altered if drawings can prove that a desk can be fitted in any other type of arrangement, i.e. alcove or similar, fulfilling all the above criteria). **Adequate ventilation:** In all cases the room must have an openable window or alternative ventilation such as a passive stack etc. Where the room relies on a window for ventilation, the minimum openable casement must be 0.5 m2. A room with only an external door does not meet the minimum requirements for adequate ventilation. Alternatively where at least one credit has been achieved under issue Hea 05 - Ventilation, this is deemed to meet the requirements for adequate ventilation.	**1**	**1**	One credit assumed.

Water

Wat 01 Internal Water Use

Where the dwellings water consumption meets the following consumption benchmarks, or where terminal fittings meet the following water consumption standards:

Calculated Water Consumption (litres/person/day) using the Wat 1 Calculator	Equivalent terminal fitting standards	Minimum Standard	Credits
>150	Typical baseline performance	N/A	0
140-150	All showers specified to 'Good' OR All taps and WC's to 'Good' OR Kitchen fittings specified to 'Excellent'	N/A	0.5
129-139	All showers specified to 'Excellent' OR All showers and bathroom taps to 'Good'	BREEAM Very Good	1
118-128	All bathroom and WC room fittings specified to 'Good' OR All bathroom fittings specified to 'Excellent'	N/A	1.5
107-117	All Bathroom and WC room fittings specified to 'Excellent' OR All Bathroom fittings Specified to 'Excellent' and WC room fitting specified to 'Good' OR All Bathroom fittings, kitchen and utility sittings specified to 'Good'	BREEAM Excellent	2
96-106	All kitchen, bathroom, utility room and WC room fittings specified to 'Good' OR All bathrooms, kitchens and utility rooms specified to 'Excellent'	N/A	2.5
<95	All bathroom fittings specified to 'Excellent' and WC room, kitchen and utility room fittings specified to 'Good'	BREEAM Outstanding	3

Please refer to Appendix Wat 01 for the Equivalent terminal fitting consumption standards

3

2

Two credits assumed.

Wat 02 External Water Use	**One credit** 1. Where a compliant rainwater collection system for external/internal irrigation use has been pro-vided to dwellings. OR 2. Where dwellings have no individual or communal garden space.			
	Compliant rainwater collection system: A compliant rainwater collection system should comply with all of the following: • No open access at the top of the collector (a childproof lid is allowed) • Provision of a tap or other arrangement for drawing off water at a height suitable for filling a standard watering can. • Connection to the rainwater downpipes with an automatic over-flow into the conventional rainwater drainage system • A means of detaching the rainwater downpipe and access provision 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 shall be durable and opaque to sun-light • 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			
	Dwellings with no individual or communal garden space or with no down pipes: In the following cases the credit can be awarded as there will only be minimal demand for external water use or no feasible location for a compliant rainwater collection system: • dwellings with no individual or communal garden space • dwellings only have balconies provided • the existing down pipe is not in individual or communal garden space and it is unfeasible to relocate the down pipe • there is no down pipe on the dwelling or no access to a down pipe and it is not feasible to relocate the water down pipe.	**1**	**1**	One credit assumed.
	Requirements for homes with individual gardens, patios and terraces: The rainwater collection system (e.g. rainwater butts) volume requirements for homes with individual gardens, patios and terraces are as follows: • 1–2 bedroom home with private garden – minimum of 150 litres • Terraces and patios – minimum of 100 litres • 3+ bedroom home with private garden – minimum of 200 litres • Where there is no planting provided and the whole of the external space is covered by a hard surface the above volume require-ments can be halved. • For houses with a front and a rear garden a rain water collection system is required only in the main (i.e. larger) garden but should meet the capacity requirements above.			

Wat 03 Water meter	One credit 1. Where an appropriate water meter for measuring usage of mains potable water has been provided to dwelling/s	**1**	**1**	One credit assumed.
	An appropriate water meter: A meter that provides a visible display of mains potable water consumption to occupants. The meter should be a permanent feature secured within the home in a location visible to occupants (i.e. not hidden within a cupboard) and capable of recording and displaying historic water consumption to allow water consumption to be monitored over time. The meter should be capable of displaying current consumption either instantaneously or at half hourly intervals.			

Materials				
Mat 01 Environmental Impact of Materials	**Roof - Existing, insulation upgrade**	**25**	**12**	Twelve credits assumed at this stage.
	External Walls - Existing			
	Internal Walls -			
	Floors – *ground:Existing*			
	upper floors: Existing			
	Windows - TBC			
	Please check the Green Guide Ratings for applicable elements via:			
	http://www.bre.co.uk/greenguide/podpage.jsp?id=2126			

Mat 02 Responsible Sourcing of Materials	For the purpose of this credit, the majority of materials in the following basic building elements are required to be responsibly sourced. • Structural Frame • Ground floor • Upper floors (including separating floors) • Roof • External walls • Internal walls (including separating walls) • Foundation/substructure (excluding sub-base materials) • Staircase • Windows, External and internal doors • Secondary fixes including skirting, panelling, fascias and bal-ustrades • Fixed furniture • Any other significant use The following materials are relevant for this credit • Brick (including clay tiles and other ceramics) • Resin-based composite materials, including GRP and polymeric render • Concrete (including in-situ and pre-cast concrete, blocks, tiles, mortars, cementitous renders etc.) • Glass • Plastics and rubbers (including EPDM, TPO, PVC and VET roofing membranes including polymeric renders) • Metals (steel, aluminium etc.) • Dressed or building stone including slate • Timber, timber composite and wood panels (including structural laminated timber components, plywood, OSB, MDF, chip-board and cement bonded particleboard) • Plasterboard and plaster • Bituminous materials, such as roofing membranes and asphalt • Other mineral-based materials, including fibre cement and calcium silicate • Products with recycled content Note that insulation materials, fixings e.g. screws, nails, brackets, adhesives, additives and other materials not listed above are also to be excluded from the assessment of this credit.	**12**	**4**	Four credits assumed at this stage.

Mat 03 Insulation	Any new insulation specified for use within the following building elements must be assessed: 1. External walls 2. Ground floor 3. Roof 4. Building services	**8**	**4**	Four credits assumed.
	4 Credits - Embodied Impact 1. Where the Insulation Index for new insulation used in the buildings is ≥2; please provide the thickness, volume, thermal conductivity and type of the insulating materials specified. 2. Where Green Guide ratings, required by the BREEAM Domestic Refurbishment Mat3 Insulation Calculator are determined using the Green Guide to specification tool.			
	4 Credits - Responsible Sourcing 3. Where ≥ 80% of the new thermal insulation used in the building elements is responsibly sourced.			

Pollution				
Pol 01 Nitrogen Oxide Emissions	**Up to 3 credits – Low NOx space heating and hot water systems** 1. Credits are awarded on the basis of NOx emissions arising from the operation of space heating and hot water systems for each refurbished dwelling as follows: a. One credit where the dry NOx emissions of space heating and hot water systems are ≤100 mg/kWh (NOx class 4 boiler). b. Two credits where the dry NOx emissions of space heating and hot water systems are ≤70 mg/kWh (NOx class 5 boiler). c. Three credits where the dry NOx emissions of space heating and hot water systems are ≤40 mg/kWh.	**3**	**0**	No credit assumed.

Pol 02 Surface Water Runoff	**First credit – neutral impact on surface water** 1. Where any new hard standing areas are permeable,this must include all new pavements, drive-ways and where applicable public rights of way, car parks and non-adoptable roads (e.g. community scale refurbishment projects). 2. Where the building is being extended onto any previously permeable surfaces, or an impermeable surface that drains onto a permeable surface (e.g. paving slabs set on concrete that drained onto soft landscaped areas) the additional run-off for rainfall depths up to 5 mm caused by the area of the extension must be managed on site using appropriate Sustainable Drainage Systems (SuDS) such as Soakaways. 3. Any calculations necessary to demonstrate that criterion 2 will be achieved should be carried out by an Appropriately Qualified Professional (AQP).			
	Appropriately qualified professional (AQO): A professional with the skills and experience to champion the use of SuDS within the overall design of the development at an early stage. The professional must be capable of understanding the site's particular surface water management needs and opportunities. In addition, they must have knowledge and experience in using SuDS-based solutions to influence the holistic design of a development's drainage system and provide the robust hydraulic design calculations referred to in key guidance documents such as The SuDS manual (CIRIA C697, 2007) and Preliminary rainfall run-off management for developments (EA/DEFRA, 2007). Suitable professionals may be found in a variety of disciplines, such as engineering, landscape design or hydrology. Geotechnical advisers or specialists may be required for SuDS techniques that allow infiltration.			
	Second credit – reducing run-off from site: basic 4. Where all run-off from the roof for rainfall depths up to 5 mm, have been managed on site using source control methods (e.g. through infiltration, soakaways etc.). This should include runoff from all existing and new parts of the roof. 5.Where required, an appropriately qualified professional should be used to design an appropriate drainage strategy for the site, ensuring criterion 1 is achieved	**3**	**1**	One credit assumed.
	Third Credit – reducing run-off from site: advanced 6. An appropriately qualified professional should be used to design an appropriate drainage strategy for the site. 7. Where run-off as a result of the refurbishment is managed on site using source control achieving the following requirements: a. The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event has been reduced by 75% from the existing site. b. The total volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration has been reduced by 75%. c. An allowance for climate change must be included for all of the above calculations, in accordance with the current best practice (PPS25, 2010)			

	Exemplary level requirements The following outlines the exemplary level requirements to achieve an innovation credit for this BREEAM issue. 8. Where all run-off from the developed site is managed on site using source control. The following must be achieved to confirm compliance: a.The peak rate of run-off as a result of the refurbishment for the 1 in 1 year event is reduced to zero. b.The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event is reduced to zero. c.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. d.An allowance for climate change must be included for all of the above calculations, in accord-ance with current best practice (PPS25, 2010). 9. Where an appropriately qualified professional has been employed to provide the above cal-culations and design an appropriate drainage strategy for the site, ensuring all above criteria are achieved.			
Pol 03 Flooding	**Two Credits - low flood risk or flood mitigation**	**2**	**0**	This credit is not sought.
	Minimum standards 1. A minimum of two credits must be achieved for this issue at the Excellent and Outstanding levels			
	Option 1 – Low flood risk 2. Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwellings are defined as having a low annual probability of flooding.			
	Option 2 – Medium/High Flood Risk 3. 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. 4. Two credits are awarded where as a result of the dwellings floor level or measures to keep water away the dwelling is defined as achieving avoidance from flooding by following Checklist A-10; Decision Strategy Flow Chart. 5. Where avoidance is not possible, two credits are achieved where a full flood resilience/resistance strategy is implemented for the dwellings in accordance with recommendations made by a Suitably Qualified Building Professional			
	The FRA shall include the following sources of flooding and flood risk: • Streams and Rivers: Flooding that can take place from flows that are not contained within the channel due to high levels of rainfall in the catchment. • Coastal or Estuarine: Flooding that can occur from the sea due to a particularly high tide or surge, or combination of both. • Groundwater: Where the water table rises to such a height where flooding occurs. Most common in low-lying areas underlain by permeable ground (aquifers), usually due to extended periods of wet weather. • Sewers and highway drains: Combined, foul or sur-face water sewers and highway drains that are tem-porarily over-loaded due to excessive rainfall or due to blockage. • Surface water: The net rainfall falling on a surface (on or off the site) which acts as run-off which has not infiltrated into the ground or entered into a drainage system. • Infrastructure failure: canals, reservoirs, industrial processes, burst water mains, blocked sewers or failed pumping stations.			

Waste					
Was 01 Household Waste	**First Credit - Recycling Facilities**				
	Scenario	**Internal recycling storage requirements**			
	Compliant collection scheme in place	3 internal recycling containers provided where recycling is not sorted post collection			
		1 internal recycling container provided where recycling is sorted post collection			
		Minimum 30 litre total capacity, no single container less than 7 litre capacity			
		Dedicated position in accordance with compliance note 1			
	No compliant collection scheme in place No adequate external storage	3 internal recycling containers provided			
		Minimum 60 litre total capacity			
		Dedicated position in accordance with compliance note 1			
	No compliant collection scheme in place Adequate external storage provided	3 internal recycling containers provided	**2**	**1**	Compliant collection scheme in place. Please ensure the requirements highlighted in yellow are met. One credit assumed.
		Minimum 30 litre total capacity, no single container smaller than 7 litre capacity			
		Dedicated position in accordance with compliance note 1			
	Compliance note 1 - Dedicated recycling containers: • in a dedicated, non unobtrusive position located in a cupboard in the kitchen, close to the non-recyclable waste bin, or located adja-cent (within 10m) to the kitchen in a utility room, storage room or connected garage • the storage containers for recycling are provided in addition to non-recyclable waste storage • the storage containers are a fixture of the dwelling				

	Second credit - Composting facilities				
	With external space	**Without external space**			
	Where a composting service or facility is provided for green/garden waste	Where a composting service or facility is provided for kitchen waste			
	Where a composting service or facility is provided for kitchen waste	Where an interior container is provided for kitchen composting waste of at least 7 litres			
	Where an interior container is provided for kitchen composting waste of at least 7 litres				
Was 02 Refurbishment Site Waste	**Projects over £300k**		**3**	**3**	Three credits assumed.
	First Credit	• Where a compliant Level 2 SWMP is in place in accordance withCN4			
	Second Credit	• Where the first credit has been achieved • Where Non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the resource efficiency benchmark in accordance with CN7 • Where the amount of waste generated against £100,000 of project value is recorded in the SWMP • Where a pre-refurbishment audit of the existing building is completed in accordance withCN10 • Where the demolition is included as part of the refurbishment programme, then the audit should also cover demolition materials			
	Third Credit	• Where the first two credits have been achieved • Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the refurbishment & demolition waste diversion benchmarks in accordance withCN8			
		• Where non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the exemplary level resource efficiency benchmark in accordance withCN11 • Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the exemplary level diversion benchmarks in accordance withCN12			

Innovation				
Man 2 Responsible Construction Practices	Please refer to issue Man 2 above for details.	**1**	**0**	This credit is not applied for.
Man 5 Protection and Enhancement of Ecological Value	Please refer to issue Man 5 above for details.	**1**	**1**	One credit assumed.
Man 6 Project Management	Please refer to issue Man 6 above for details.	**2**	**2**	Two credits assumed.
Hea 4 Inclusive Design	Please refer to issue Hea 4 above for details.	**1**	**0**	This credit is not applied for.
Ene 2 Energy Efficiency Rating	Please refer to issue Ene 2 above for details.	**1**	**0**	This credit is not applied for.
Ene 8 Display Energy Devices	Please refer to issue Ene 8 above for details.	**1**	**1**	One credit assumed.
Wat 1 Internal Water Use	Please refer to issue Wat 1 above for details.	**1**	**0**	This credit is not applied for.
Pol 2 Surface Water Run-off	Please refer to issue Pol 2 above for details.	**1**	**0**	This credit is not applied for.
Was 2 Refurbishment Site Waste Management	Please refer to issue Was 2 above for details.	**1**	**1**	One credit assumed.
	ESTIMATED TOTAL BEFORE 'WEIGHTING' FOR 'CATEGORY ISSUES' – SCORE OUT OF 125	**71**		
	FINAL ESTIMATED TOTAL PERCENTAGE	**70.78**	**%**	
	ESTIMATED BREEAM RATING	**EXCELLENT**		

DOMESTIC REFURBISHMENT RATING SHEET

BREEAM Score	ISSUE CREDITS			WEIGHTING FACTOR	CREDITS SCORE
	CREDITS AVAILABLE	CREDITS ACHIEVED	% ACHIEVED		
ISSUE CATEGORY	a	b	b/a x 100 = c	d	c x d = e
MANAGEMENT	11	10	90.91	0.12	10.91
HEALTH & WELL BEING	12	10	83.33	0.17	14.17
ENERGY	29	17	58.62	0.43	25.21
WATER	5	4	80.00	0.11	8.80
MATERIALS	45	20	44.44	0.08	3.56
POLLUTION	8	1	12.50	0.06	0.75
WASTE	5	4	80.00	0.03	2.40
INNOVATION	10	5			5.00
TOTAL	125				**70.78** %

CREDIT SCORE PER ISSUE											
	1	2	3	4	5	6	7	8	9	10	TOTAL
Management	3	2	1	1	1	2					10.0
Health	1	4	1	1	2	1					10.0
Energy	1	1.0	3	2	2	1	2	2	2	1	17.0
Water	2	1	1								4.0
Materials	12	4	4								20.0
Pollution	0	1	0								1.0
Waste	1	3									4.0
Innovation	0	1	2	0	0	1	0	0	1		5.0
TOTAL (UNWEIGHTED CREDITS)											**71.0**

BREEAM Rating	SCORE	PRELIMINARY RATING
PASS	30%	**EXCELLENT**
GOOD	45%	
VERY GOOD	55%	
EXCELLENT	70%	
OUTSTANDING	85%	

NB - ALL DATA IS 'ROUNDED'. FINAL SCORE IS JUDGED ONLY TO WHOLE NUMBER FULLY ACHIEVED (i.e. 99.99 is scored as 99, NOT 100)

PERCENTAGE POINTS PER SINGLE CREDIT POINT, BY ISSUE			
Man	1.10%	Mat	0.20%
Hea	1.40%	Pol	0.75%
Ene	1.50%	Was	0.60%
Wat	2.20%	Inn	1.00%