
Greengage

# QA

# 56 Elsworthy Road, London

# BREEAM Domestic Refurbishment Pre-assessment Framework Report

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# CONTENTS

# 1.0 INTRODUCTION

1.1 Greengage Environmental was commissioned by PPM (BVI) Limited to undertake a BREEAM Domestic Refurbishment (BREEAM RD) Pre-Certification Assessment ('pre-assessment') for the proposed residential development at 56 Elsworthy Road.

1.2 A preliminary BREEAM RD workshop has been undertaken with the design team to ensure the team fully understand the target credits, the detailed information required to demonstrate compliance, who is responsible for actioning each target credit at the design stage, and who will be responsible for tracking compliance through the refurbishment stage. This BREEAM RD Pre-Assessment report confirms the rating currently being achieved by the design and presents the framework of credits necessary to achieve an 'Excellent' rating.

1.3 56 Elsworthy Road is a residential property located within the Elsworthy Conservation Area within the administrative boundary of the London Borough of Camden (LB Camden). It is centred on grid reference TQ271839, OS co-ordinates X 527196 Y 183991. The application site is currently occupied by three flats and is surrounded by similar residential properties. To the south of the property is Primrose Hill and the nearest underground station is Swiss Cottage, to the north.

1.4 The proposed development comprises:

- Full refurbishment and conversion of the existing property from three flats to one house and a flat; and
- Excavation to form a basement and construction of a rear extension.

1.5 Sustainability and environmental performance are being considered from the outset for the design – the scheme will meet the Lifetime Homes standards, will reduce energy and water consumption and will include low $NO_x$ emissions boilers and water meters. The team will address materials selection and waste management throughout the design process and sustainable construction techniques will be reviewed. Overall the development will target a BREEAM RD 'Excellent' rating.

1.6 LB Camden's Core Strategy Policy DP22 and the Camden Planning Guidance CPG3 states that all developments involving a change of use or conversion of over 500sqm of any floorspace will be expected to achieve 60% of the un-weighted credits in the Energy and Water category, 40% of the Materials category of the BREEAM assessment and achieve an 'Excellent' rating from 2013. This report will outline how the design team are committing to complying with these policies.

1.7 This document therefore demonstrates the design team's commitment to bringing forward a sustainable residential development on 56 Elsworthy Road by providing a framework for achieving a BREEAM RD 'Excellent' rating for the proposed development.

# 2.0 BREEAM REFURBISHMENT – DOMESTIC BUILDINGS

## BACKGROUND

2.1 Launched on 11th June 2012, the BREEAM RD replaced EcoHomes as the assessment and certification method for improving the environmental performance of existing dwellings. It is also affiliated to the BRE Global International Code for a Sustainable Built Environment. As the most up-to-date version, the second issue of the BREEAM Refurbishment of Domestic Buildings 2.0 has been used for this pre-assessment.

## CATEGORIES

2.2 BREEAM RD aims to encourage and reward best practice through the recognition of improvements made to existing dwellings. It evaluates buildings against a number of environmental criteria captured under six environmental categories, ranging from:

- **Management** – rewards good construction site practises, provision of information to building occupants to encourage environmental awareness and addresses home security. It also covers issues relating to effective Project Management and sustainable site practices;
- **Health & Wellbeing** – promotes a healthy, safe and comfortable internal environment;
- **Energy** – rewards energy efficiency and renewable energy generation;
- **Water** – promotes water efficiency and water recycling;
- **Materials** – encourages the retention of existing elements and rewards the responsible sourcing of materials**;**
- **Waste** – promotes best practice with regards to waste management during refurbishment works and the provision of facilities to enable household recycling throughout occupation;
- **Pollution** – promotes measures to reduce pollution by using space heating and hot water systems with low $NO_x$ emissions and by providing flood resistance for dwellings in medium or high flood risk zone; and

- **Innovation** – provides opportunities for exemplary performance and innovation to be recognised that are not included within, or go beyond the requirements of the credit criteria.

2.3 The first stage of the process is to carry out an assessment of the building's existing performance. This is to establish the building's baseline performance and issues the building may already achieve, as well as to identify additional work required in order for the proposed development to meet the requirements of particular issues. The existing performance can be identified by carrying out a site visit or through existing performance data that may already be available (e.g. the English House Condition Survey).

2.4 The certified assessment is undertaken in two stages: a Design Stage (DS); and a Post Refurbishment Stage Assessment (PRSA) as follows:

- **Design Stage Assessment** – provides a rating of the refurbishment as specified, otherwise referred to as the interim rating. Ideally, the assessment is carried out prior to refurbishment during the design process using specification and other evidence to document measures to be implemented; and
- **Post Refurbishment Stage Assessment** – confirms the final BREEAM rating through the `as-refurbished' performance of the building. The PRSA is completed and certified after practical completion of the refurbishment works.

## LEVELS AND SCORING

2.5 Within each category, individual environmental criteria are allocated a specific number of integer credits. The total number of credits for each category is then multiplied by the category weighting factor, designed to reflect the importance of that environmental issue, which determines the points score relating to that category in BREEAM RD.

2.6 BREEAM RD has five rating benchmarks, as follows:

**Table 2.1 BREEAM RD Rating Benchmarks**

| BREEAM RD Ratings | | % Score |
|---|---|---|
| OUTSTANDING | Less than top 1% of UK domestic refurbishments (innovator) | ≥85 |
| EXCELLENT | Top 10% of UK domestic refurbishments (best practice) | ≥70 |
| VERY GOOD | Top 25% of UK domestic refurbishments (advanced good practice) | ≥55 |
| GOOD | Top 50% of UK domestic refurbishments (intermediate good practice) | ≥45 |
| PASS | Top 75% of UK domestic refurbishments (standard good practice) | ≥30 |
| UNCLASSIFIED | Non-compliant with BREEAM | <30 |

## MINIMUM STANDARDS

2.7 Unlike the BRE's EcoHomes assessment, BREEAM RD contains mandatory standards under the Energy, Water, Materials, Health & Wellbeing and Pollution categories, which must be met before even the lowest level of the BREEAM RD rating can be achieved – known as 'minimum' standards. For example, the Energy Efficiency Rating Post Refurbishment (Ene 02) and Ventilation (Hea 05) must demonstrate an improvement in performance against the existing building before any BREEAM rating can be awarded, and the mandatory requirements grow more onerous with each higher level of rating targeted. Therefore, the BREEAM RD demands incrementally higher standards for energy and water to be met at each performance level.

**Table 2.2 Minimum Standards by Rating Level**

| BREEAM Issue | Minimum Credits Required For Each Rating Level | | | | |
|---|---|---|---|---|---|
| | **Pass** | **Good** | **Very Good** | **Excellent** | **Outstanding** |
| **Ene 02: Energy Efficiency Rating Post Refurbishment** | 0.5 | 1.0 | 1.5 | 2.5 | 3.5 |
| **Wat 01: Internal Water Use** | - | - | 1 | 2 | 3 |
| **Hea 05: Ventilation** | 1 | 1 | 1 | 1 | 1 |
| **Hea 06: Safety** | - | - | - | 2 | 2 |
| **Mat 02: Responsible Sourcing of Materials** | Criterion 3 only | Criterion 3 only | Criterion 3 only | Criterion 3 only | Criterion 3 only |

## THE PRE-CERTIFICATION ASSESSMENT

2.8 The design team for 56 Elsworthy Road has committed to achieving a BREEAM RD 'Excellent' rating for the proposed residential dwellings on-site. This is considered to be a challenging requirement due to the mandatory standards set by the BREEAM RD scheme, in particular for energy efficiency, given that the proposed development is located in a conservation area and has limited opportunity due to heritage considerations to upgrade the thermal performance of the building fabric such as existing windows.

2.9 Pursuant to this, the team has undertaken a BREEAM RD pre-assessment with a qualified BREEAM RD assessor from Greengage, in order to determine how the proposed development is performing against the BREEAM RD standards.

2.10 The BREEAM RD pre-assessment is based on the relevant design drawings available at the time of review, and commitments by the team to incorporate environmental features at the appropriate stage as detailed design and refurbishment commences.

2.11 At the pre-assessment stage, the BREEAM RD appraisal is required to be conservative in order to avoid a situation arising where credits are awarded optimistically, which then have to be taken away later on during the certification process. It may, therefore, be the case that more credits can be secured for this development as the design and construction stage progresses, even if they are not reflected in this pre-assessment. Likewise, it should be noted that credits targeted at this stage might not be feasible as the design and construction progresses and situations change.

## THE CERTIFIED ASSESSMENT

2.12 To secure the BREEAM RD credits at the certified assessment stage, the team is committed to providing all the necessary supporting evidence that will include, but is not limited to, relevant design drawings (plans & elevations), calculations, copies of the design specification, manufacturer's literature etc. This information will become available for assessment as the design progresses.

2.13 Upon demonstration that all BREEAM RD target credits have been secured, a DS Report is submitted to the BRE for QA and Interim Certification. An Interim Certificate is then issued for each dwelling type once it has passed the QA process.

2.14 The second stage of a BREEAM RD assessment comprises a BREEAM Post Refurbishment (PR) review of each dwelling within the development under assessment. During the PRSA review, documentary, photographic, or site survey evidence must be collated to demonstrate that each dwelling has been refurbished in accordance with the details provided at the DS Assessment. Certain pieces of evidence may apply to more than one dwelling, but each dwelling must have a suitable audit trail of evidence to justify the award of the final credit score. On completion of the PR review, a final BREEAM PRSA Report is submitted to the BRE in order to receive final BREEAM Domestic Post Refurbishment Certificates for each dwelling.

## BREEAM RD PEFORMANCE

2.15 The aim of this pre-assessment was to identify the opportunities and constraints of the application site and the proposals, and to maximise the opportunities to enhance the environmental performance of the design.

2.16 The pre-assessment has provided a framework for a design that is likely to achieve a BREEAM Domestic Refurbishment points score of 72.32%. Please note that the minimum score necessary for a `Excellent rating is 70%; therefore the predicted score for the proposed development at 56 Elsworthy Road provides a small buffer on the targeted rating, giving comfort that the rating will be achieved. We would always recommend that a score of at least 1 or 2 points above the minimum score is aimed for during the pre-planning stages and achieved at the final certification stage. This is to ensure that during the BRE third party review of the certified final report, in the rare event that a credit was disputed and revoked the target rating would still be likely to be achieved.

# 3.0 FRAMEWORK SUMMARY

3.1 A summary of performance for the proposed development is shown in the Table 3.1 below. Table 3.1 identifies the credits to be targeted in order to achieve the required rating, whether any mandatory elements exist for each credit and the design team member responsible for actioning the credit requirements. Where more than one design team member has been allocated, this reflects the varying actions required to ensure appropriate compliance evidence is provided.

3.2 Some credits have been allocated to the responsibility of future team members/sub consultants e.g. contractor who will be made aware of the BREEAM Domestic Refurbishment requirements at the time of their appointment.

**Table 3.1 Design Team Members**

| Design Team | Company | Representative | Acronym/Abbreviation |
|---|---|---|---|
| Client | PPM (BIV) Limited | Damian Maguire | PBL |
| Architect | Sacks Maguire Architects | Damian Maguire<br>Marco Fazio | SMA |
| Mechanical & Electrical Engineer | TBC | TBC | M&E |
| BREEAM Consultants | Greengage | Candice Homewood | GG |
| Contractor | TBC | TBC | Contractor |
| Suitably Qualified Ecologist | TBC | TBC | SQE |
| Suitably Qualified Acoustician (Optional) | TBC | TBC | SQA |

**Table 3.2 BREEAM Domestic Refurbishment Pre-Certification Assessment Summary**

| | Credit Ref | Credit Title | Available Credits | Targeted Credits | Mandatory Elements? | Responsible |
|---|---|---|---|---|---|---|
| Management - 1.09% Per credit | Man 01 | Home Users Guide | 3 | 3 | No | PBL/Contractor |
| | Man 02 | Responsible Construction Practices | 2 | 2 | No | Contractor |
| | Man 03 | Construction Site Impacts | 1 | 1 | No | Contractor |
| | Man 04 | Security | 2 | 2 | No | SMA |
| | Man 05 | Protection and Enhancement of Ecological Features | 1 | 1 | No | SMA |
| | Man 06 | Project Management | 2 | 2 | No | PBL/SMA |
| | **Total Credits** | | **11** | **11** | | |
| | **Contribution to Overall Score (%)** | | **12** | **12** | | |
| Health and Wellbeing - 1.42% per credit | Hea 01 | Daylighting | 2 | 2 | No | SMA |
| | Hea 02 | Sound Insulation | 4 | 2 | No | SMA/SQA/Contractor |
| | Hea 03 | Volatile Organic Compounds | 1 | 1 | No | PBL/SMA/Contractor |
| | Hea 04 | Inclusive Design | 2 | 2 | No | SMA |
| | Hea 05 | Ventilation | 2 | 1 | YES | M&E |
| | Hea 06 | Safety | 1 | 1 | YES | SMA |
| | **Total Credits** | | **12** | **9** | | |
| | **Contribution to Overall Score (%)** | | **17** | **12.75** | | |

| | Credit Ref | Credit Title | Available Credits | Targeted Credits | Mandatory Elements? | Responsible |
|---|---|---|---|---|---|---|
| Energy – 1.48% per credit | Ene 01 | Improvement in Energy Efficiency rating | 6 | 2 | No | SMA/M&E |
| | Ene 02 | Energy Efficiency Rating Post Refurbishment | 4 | 2.5 | YES | SMA/M&E |
| | Ene 03 | Primary Energy Demand | 7 | 2.5 | No | SMA/M&E |
| | Ene 04 | Renewable Energy Technologies | 2 | 0 | No | - |
| | Ene 05 | Energy Labelled White Goods | 2 | 2 | No | SMA |
| | Ene 06 | Drying Space | 1 | 1 | No | SMA |
| | Ene 07 | Lighting | 2 | 2 | No | M&E |
| | Ene 08 | Energy Display Devices | 2 | 2 | No | PBL/M&E |
| | Ene 09 | Cycle Storage | 2 | 2 | No | SMA |
| | Ene 10 | Home Office | 1 | 1 | No | SMA |
| | **Total Credits** | | **29** | **18** | | |
| | **Contribution to Overall Score (%)** | | **43** | **25.21** | | |
| Water – 2.20% per credit | Wat 01 | Internal Water Use | 3 | 2 | YES | SMA |
| | Wat 02 | External Water Use | 1 | 0 | No | SMA |
| | Wat 03 | Water Meter | 1 | 1 | No | PBL/M&E |
| | **Total Credits** | | **5** | **3** | | |
| | **Contribution to Overall Score (%)** | | **11** | **6.60** | | |

| | Credit Ref | Credit Title | Available Credits | Targeted Credits | Mandatory Elements? | Responsible |
|---|---|---|---|---|---|---|
| Materials – 0.18% per credit | Mat 01 | Environmental Impact of Materials | 25 | 19 | No | SMA |
| | Mat 02 | Responsible Sourcing of Materials | 12 | 6 | YES | Contractor |
| | Mat 03 | Insulation | 8 | 8 | No | SMA/M&E/ Contractor |
| | **Total Credits** | | **45** | **33** | | |
| | **Contribution to Overall Score (%)** | | **8** | **5.87** | | |
| Waste – 0.8% per credit | Was 1 | Household Waste | 2 | 1 | No | SMA/PBL |
| | Was 2 | Refurbishment Site Waste Management | 3 | 3 | No | Contractor |
| | **Total Credits** | | **5** | **4** | | |
| | **Contribution to Overall Score (%)** | | **3** | **2.4** | | |
| Pollution – 0.75% per credit | Pol 01 | NOx Emissions | 3 | 2 | No | M&E |
| | Pol 02 | Surface Water Run-off | 3 | 2 | No | PBL/FRA |
| | Pol 03 | Flooding | 2 | 2 | YES | PBL/FRA |
| | **Total Credits** | | **8** | **6** | | |
| | **Contribution to Overall Score (%)** | | **6** | **4.5** | | |
| Innovation – 1% per credit | Man 02 | Responsible Construction Practices | 1 | 0 | No | Contractor |
| | Man 05 | Protection and Enhancement of Ecological features | 1 | Potential | No | PBL/GG |
| | Man 06 | Project Management | 2 | 0 | No | PBL |
| | Hea 04 | Inclusive Design | 1 | 1 | No | SMA |

| | Credit Ref | Credit Title | Available Credits | Targeted Credits | Mandatory Elements? | Responsible |
|---|---|---|---|---|---|---|
| | Ene 02 | Energy Efficiency Rating Post Refurbishment | 2 | 0 | No | - |
| | Ene 08 | Energy Display Devices | 1 | 1 | No | PBL/M&E |
| | Wat 01 | Internal Water Use | 1 | 0 | No | - |
| | Was 02 | Refurbishment Site Waste Management | 1 | Potential | No | Contractor |
| | Pol 02 | Surface Water Run-off | 1 | 0 | No | - |
| **OVERALL WEIGHTED SCORE** | | | **100%** | **72.32%** | | |
| | | | **Rating** | **Excellent** | | |

# 4.0 PRE-CERTIFICATION ASSESSMENT SUMMARY

4.1 We have provided below a summary of the environmental performance measures targeted within each BREEAM RD category, explaining the pathway to achieve compliance for an 'Excellent' rating and the additional benefits that would arise at both the refurbishment and operational stages to the client and any future residents.

## MANAGEMENT

4.2 11 credits in the Management category have been targeted under the BREEAM RD assessment for the proposed development. Credits have been targeted in order to ensure best practice site management during the refurbishment phase of the development, requiring a high Considerate Constructors' Scheme score and implementation of site best practices to minimise potential environmental impacts. The applicant will provide all tenants with a Home User Guide, covering non-technical information relevant to the home occupier, including details on how to maximise on the sustainability performance of the home. An ecology credit can be awarded as existing trees and their roots will be protected during the construction phase. The exemplary credit will be targeted here by implementing all general recommendations and 30% of additional recommendations detailed in the suitably qualified ecologist's report.

## HEALTH & WELLBEING

4.3 Within the Health & Wellbeing category, the applicant has committed to achieving nine credits plus an exemplary credit for inclusive design. The team will ensure that the refurbishment results in a neutral impact on daylighting and minimum daylighting standards are met. The dwellings will achieve improved sound insulation adhering to Part E of the Building Regulations to reduce sound transmission between the dwellings, as well as to minimise any potential noise disruption associated from nearby noise sources. Appropriate ventilation levels will be provided in accordance with Part F of the Building Regulations to encourage a healthy internal environment. In addition, an inclusive design approach will be adopted, including compliance with Lifetime Homes and Part M to optimise the accessibility of the home and its future adaptability to cope with changing needs of the households.

## ENERGY

4.4 Eighteen credits are targeted on the pathway to an 'Excellent' rating within this category. In order to achieve the required improvement to the dwellings' existing energy efficiency rating from 40 (E rating) to a minimum of 70 (C rating), as part of ongoing detailed design stage various aspects of the development will continue to be addressed in order to maximise as far as possible the energy efficiency of the building, including:

- Ensuring the building is as well insulated and airtight as possible in order to minimise heat loss from the dwellings;
- Use of energy-efficient internal lighting; and
- Energy efficient external lighting with all fittings controlled for the presence of daylight and motion-detecting sensors.

4.5 The team has also committed to providing adequate secure drying space, home office, energy labelled white goods and energy display devices installed in the dwellings to monitor electricity and primary fuel consumption (in addition to water use) that will encourage resource efficiency during the operational phase of the development.

4.6 Six cycle fittings within a compliant secure location are being implemented to encourage cycling over the use of a car.

## WATER

4.7 Three credits are targeted in the Water category on the pathway to an 'Excellent' rating.

4.8 Internally, water efficient sanitary fittings will be specified in each dwelling to conserve water at its point of use by ensuring all fittings within the bathroom, WC rooms, kitchens and utility rooms reach an Equivalent Terminal Fitting Standard of 'Good'; therefore, the following water efficiency measures could be expected for incorporation within a typical dwelling:

- WCs at 4 litre effective flushing volumes;
- Taps with low flow regulators e.g. timed turn off, electronic, spray or aerated (at 5 litres per min);
- Showers with a nominal flow rate of 8 litres per minute; and
- Baths at 140 litre capacity to overflow.

4.9 The team has also committed to display devices that measure and reduce water consumption.

**MATERIALS**

4.10 Under the pathway to a BREEAM RD 'Excellent' rating, thirty three credits in the Materials category have been targeted. Much of the existing building envelope will be retained reducing the amount of embodied carbon associated with the development. The team will ensure that any new materials, including insulation, used in the refurbishment will have a low environmental impact over the full life cycle of the building by specifying as many building elements as possible with a high rating under the *Green Guide to Materials Specification.* The team will also look at improving the thermal index of retained elements through adding additional insulation. Further to this, any materials specified will be responsibly sourced by using EMS (or equivalent) certified suppliers and for timber, FSC (or equivalent) certified timber suppliers.

**WASTE**

4.11 Four of the five credits available are targeted in the Waste category for the proposed development's pathway to an 'Excellent' rating. For the refurbishment phase, a Site Waste Management Plan (SWMP) will be produced that will ensure procedures and commitments are put in place for the following:

- Monitoring of waste generated on-site;
- Sorting, reuse and recycling of refurbishment waste, either on-site or through a licensed external contractor;
- Complying with the resource efficiency benchmarks for the amount of non-hazardous waste generated by meeting or exceeding 16.90 tonnes or 26.52$m^3$ per £100,000 of project value; and
- Diversion of at least 70% of non–hazardous refurbishment waste and 80% of demolition waste generated from landfill.

4.12 In addition to the SWMP, a pre-refurbishment audit of the existing building will be carried out to identify key refurbishment materials, in addition to potential applications for the reuse and recycling of these materials.

4.13 In order to ensure that residents of the proposed development maximise the opportunities provided for recycling, the applicant will provide internal recycling facilities for each dwelling to cater for recyclable waste (separate to any bins provided for other non-recyclable waste), in line

with the BREEAM RD requirements for storage of non-recyclable and recyclable household waste, with the Local Authority sorting the recyclable waste following collection from the designated external storage area.

**POLLUTION**

4.14 Six credits are targeted in the Pollution category. The team has confirmed that the application site is located in a low flood risk zone and that there will be a neutral impact on surface water run-off as the area of hard-standing will decrease, due to the proposals for a small lawn area. The design team are also committed to prevent and control potential forms of pollution arising from the construction phase (see paragraph 4.2 above), the applicant has committed to ensuring that dry $NO_x$ emissions arising from the gas boiler systems provided for the proposed development will be no more than 70mg/kWh.

**INNOVATION**

4.15 The team is reviewing potential credits that can be achieved in the innovation category by complying with exemplary level requirements and will target credits as appropriate. At this stage, to remain conservative, only three credits have been targeted which are inclusive design as mentioned above (see paragraph 4.3), energy display devices (see paragraph 4.5) and the enhancement of ecological features but this will be reviewed should the scheme process to full certification as they is still the potential to achieve further credits.

# 5.0 CONCLUSION

5.1 This BREEAM RD Framework report has set out the pathway to achieve an 'Excellent' rating for the proposed residential development at 56 Elsworthy Road. The framework to meet these ratings is based upon the achievability and appropriateness of the credits for both the current and any future design of the proposed development, which may change as detailed design progresses.

5.2 This report highlights the proposed development's sustainability credentials and environmental performance through compliance with BREEAM RD standards. To attain a BREEAM RD 'Excellent' rating for the residential dwellings, the score that is anticipated to be achieved is 72.32%. Therefore, the predicted score for the proposed development at 56 Elsworthy Road provides a small buffer on the targeted rating, giving comfort that the rating will be achieved. We would always recommend that a score of at least 1 or 2 points above the minimum score of 70% for an 'Excellent' rating is aimed for during the pre-planning stages to ensure that during the certification stage and the BRE third party review, in the rare event that a credit was disputed, the target rating would still be likely to be achieved.

5.3 An achievable pathway to a BREEAM RD 'Excellent' rating has therefore been committed to by the client team.

5.4 Following this framework report, a BREEAM RD Design Stage and eventually a Post-Refurbishment Stage Assessment are recommended in order to gain full BREEAM RD certification for the proposed development.

– END –