

ECOUNICO LTD

128 City Road,
London
EC1V 2NX
Tel: 020 7407 4018

Reading Borough Council

Planning Department
Civic Offices
19 Bridge Street
Reading
RG1 2LU

School of Art, University of Reading - BREEAM Rating Shortfall Compensation Methodology

1. Background and Planning Context

University of Reading relocated the School of Art to the formerly unoccupied Central Kitchen building, located within the administrative boundary of Reading Borough. The project involved the refurbishment and extension of the existing Central Kitchen building, with the extension constructed on the existing hardstanding forecourt area to the east.

The refurbished and extended building now provides workshops, studio and gallery spaces, staff and student welfare facilities, a shop, and visitor accommodation.

As part of the planning permission (planning reference - PL/25/0512), a condition was imposed requiring the development to achieve a minimum BREEAM 'Very Good' rating.

2. Sustainability Performance and BREEAM Outcome

The completed School of Art building demonstrates a high standard of sustainability performance, particularly in relation to energy efficiency and carbon reduction. The project has achieved Net Zero operational carbon and significantly exceeds the energy and carbon performance benchmarks typically associated with refurbishment projects.

Despite this strong performance, the final certified BREEAM rating achieved was 'Good', with a final score of **46.76%**, representing a shortfall of **8.24%** against the 55% threshold required for a 'Very Good' rating.

This outcome does not reflect a compromise in the building's actual sustainability performance, but instead results from limitations in meeting BREEAM's stringent evidence and documentation requirements.

The key reasons for the shortfall are as follows:

1. **RIBA Stage 2 Evidence Gaps** - Certain credits anticipated at RIBA Stage 2 could not be fully evidenced at later stages due to documentation gaps and incomplete audit trails.

2. **Project Management Changes** - Changes in project management personnel during delivery led to inconsistencies in the implementation and tracking of BREEAM-related actions. Due to administrative error, the contractor was not directly required to undertake the required level of BREEAM involvement limiting the project's ability to secure compliant evidence for several contractor-related credits.
3. **Construction Phase Documentation Limitations** - Several construction-stage credits could not be awarded due to insufficient or non-compliant supporting documentation from the contractor. Although some evidence was provided retrospectively, it did not fully meet BREEAM requirements. As partial compliance is not permitted under BREEAM, credits could not be awarded where documentation was incomplete.

Throughout the project, the client, design team, and sustainability consultants actively explored and implemented practical and cost-effective measures to recover additional BREEAM credits. While some additional credits were secured, these were insufficient to bridge the remaining gap to the 'Very Good' threshold.

It was concluded that introducing further measures at this stage solely to achieve a 'Very Good' rating would not be practical or cost-effective. Such measures would likely require disruptive retrofit works, potentially undermining the building's operational efficiency and long-term sustainability performance, without guaranteeing achievement of the required rating.

3. Council Position and Need for a Bespoke Approach

Reading Borough Council acknowledged that achieving the BREEAM 'Very Good' rating through further on-site measures for the completed development is unlikely to be practical or cost-effective. Accordingly, the Council requested that the University of Reading propose alternative sustainability measures to compensate for the BREEAM rating shortfall.

As there is no established standard methodology for compensating a BREEAM shortfall outside the assessed building, the Council also requested the submission of a bespoke compensation methodology, against which the effectiveness of any proposed measures can be assessed.

The following section of this Technical Note sets out a proposed bespoke BREEAM rating compensation methodology, which is intended to be reviewed and agreed by Reading Borough Council prior to the identification and implementation of additional sustainability measures by the University of Reading.

4. Bespoke BREEAM Rating Compensation Methodology Proposal

4.1 Purpose and Scope

This bespoke methodology has been developed specifically for the completed School of Art building at the University of Reading to address the shortfall in achieving the required BREEAM 'Very Good' rating. The methodology responds to the request from Reading Borough Council to establish a robust and proportionate mechanism to compensate the BREEAM shortfall where additional on-site measures within the assessed building are no longer practical or cost-effective.

The approach is based on the principle that BREEAM Energy credits represent measurable improvements in operational energy performance and associated carbon emissions. The methodology therefore converts the BREEAM shortfall for this specific building into an equivalent operational carbon reduction requirement, against which additional sustainability measures can be assessed.

4.2. BREEAM Shortfall for the School of Art Building

The School of Art building achieved a final BREEAM score of 46.76%, resulting in a shortfall of 8.24% against the 55% threshold required to achieve a 'Very Good' rating.

Under the BREEAM assessment methodology used for this building, one Energy credit is equivalent to 0.64% of the overall BREEAM score. On this basis, the shortfall equates to approximately:

$$8.24\% \div 0.64\% \approx 13 \text{ Energy credits}$$

This methodology therefore seeks to compensate for the carbon benefit associated with approximately 13 Energy credits.

4.3 Building-Specific Energy and PV Modelling Approach

To establish a robust and transparent carbon indicator for the School of Art building, the building will be energy-modelled using IES VE software under the following two scenarios:

1. **Baseline scenario (without PV)** - The completed School of Art building will be modelled without any on-site photovoltaic (PV) generation, using the same building geometry, fabric performance, systems, and operational assumptions applied in the original energy and carbon assessment.
2. **PV-enhanced scenario (with PV)** - The same building model will include the actual PV installation, based on the actual roof areas, orientation, pitch, shading constraints, and the specific PV technology used the building.

The difference in regulated energy demand and operational carbon emissions between the two scenarios will be used to determine the total Energy credit improvement attributable to PV.

4.4 Determining the PV Capacity Required per Energy Credit

Using the PV-enhanced model:

- The total number of BREEAM Energy credits gained through the introduction of PV will be identified; and
- The total installed PV capacity (kWp) associated with this improvement will be recorded.

From this, the PV capacity required to achieve **one BREEAM Energy credit** for the School of Art building will be calculated as:

$$\text{Total PV capacity (kWp)} \div \text{Total Energy credits achieved}$$

The associated annual operational carbon saving per Energy credit (kgCO₂e/year) will then be calculated using the same building-specific carbon accounting approach applied to the School of Art building.

This value defines the building-specific carbon indicator for one BREEAM Energy credit.

4.5 Carbon-Equivalent BREEAM Compensation Requirement

The total carbon-equivalent compensation requirement is calculated by:

- Multiplying the carbon value of one Energy credit (kgCO₂e/year) by the number of Energy credits equivalent to the BREEAM shortfall (approximately 13 credits).

This establishes a building-specific annual operational carbon reduction target, representing the minimum level of carbon benefit required to compensate for the BREEAM 'Very Good' shortfall.

4.6 Assessment of Additional Sustainability Measures

Additional sustainability measures which will be proposed by the University of Reading, such as PV installations or energy efficiency measures on other University-owned buildings, will be assessed against the building-specific carbon-equivalent target.

Each proposed measure will be evaluated by:

- Quantifying its predicted annual operational carbon savings (kgCO₂e/year);
- Applying the same carbon accounting methodology used to define the School of Art Energy credit carbon indicator; and
- Comparing the cumulative carbon savings against the required carbon-equivalent compensation target.

Measures will be considered sufficient where the total predicted operational carbon savings **equal or exceed** the carbon-equivalent value required to compensate the BREEAM shortfall.

4.7. Verification and Reporting

To ensure transparency and robustness:

- All modelling assumptions, inputs and outputs will be fully documented;
- Calculations will be undertaken or independently reviewed by a suitably qualified sustainability professional;
- Implementation of the agreed measures will be confirmed through appropriate post-installation evidence; and
- A short summary report or technical note will be submitted to Reading Borough Council demonstrating that the carbon-equivalent compensation requirement has been met or exceeded.

8. Summary

This proposed methodology provides a clear, building-specific and outcome-focused approach to compensating the BREEAM rating shortfall for the completed School of Art building. By directly linking BREEAM Energy credits to measurable operational carbon reductions derived from building-specific PV modelling, it ensures that the sustainability intent of a BREEAM 'Very Good' rating is delivered in practice without requiring impractical or disruptive retrofit works.

Prepared By

Sergey Barekryan

Director

BREEAM Assessor, BREEAM Accredited Professional

Independent Energy and Sustainability Consultant

Email: sergey.barekryan@ecounico.com

Tel: 077923 224898