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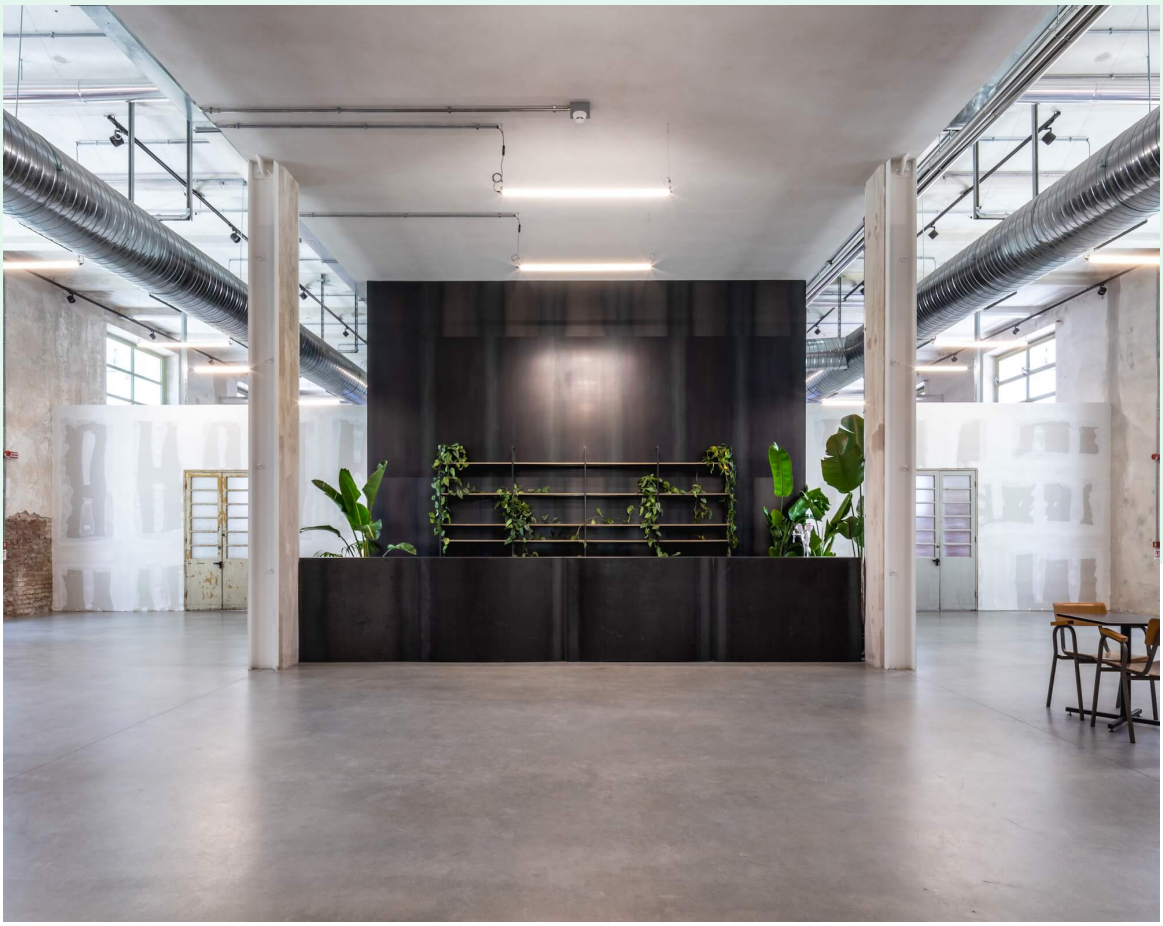
TECHNICAL MANUAL

BREEAM Fit Out

Commercial | Version 7



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Cover image

Manifattura Tabacchi – Building 11, Firenze, Italy

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About this document

This document is the technical manual for BREEAM Fit Out Version 7. It describes an environmental performance standard against which fit-out projects can be assessed and achieve a BREEAM rating.

The scheme document and the information detailed within is intended for use by trained, qualified and licensed BREEAM Assessors in accordance with the procedural and operational requirements of BREEAM (as described in the BREEAM Operations Manual, SD5070) under the terms and conditions of a BREEAM licence. This document should be used by non-BREEAM Assessors for reference purposes only.

Changes to this document

This document is subject to revision and can be reissued from time-to-time by BRE Global. A schedule of the publication date for each issue is provided below.

Document reference	Version / issue number	Issue date
SD6076	7.0.0	15/07/2026

Introduction

About BREEAM

BREEAM is the world's first and leading holistic framework for assessing asset sustainability performance in the global built environment. It is driven by a mission to enable projects of any size to protect and enhance asset value on the way towards a healthy and resilient future in the built environment.

Launched in 1990 and applied in more than 100 countries, BREEAM has certified more than a million assessments from infrastructure, through building design, to existing assets.

How BREEAM drives asset value

Defined by science and informed by the global real estate and construction industry, BREEAM standards reflect and drive market shifts by encouraging data-driven strategies that deliver quantifiable environmental, social and economic performance. By using a holistic and flexible approach that encourages positive outcomes, BREEAM delivers a tailored roadmap to drive asset value from a financial, environmental, performance, risk, health, and social perspective.

BREEAM has provided robust and credible third-party certification for over three decades, delivering sustainability performance transparency across every phase of the built environment, from new builds to operations, refurbishments, and fit outs.

BREEAM certification involves a rigorous assessment process that recognises and reflects the value in higher performing assets and encourages excellence. BREEAM certification provides a proven value-generation tool to deliver sustainability performance, manage sustainability risk, enhance marketability and provide validation of sustainability performance claims.

The BREEAM schemes

BREEAM schemes are based on an international version that is applicable in any country that doesn't have a country-specific scheme, and are operated by BRE Global. In some countries, BREEAM schemes are adapted to the local market while maintaining the BREEAM rigour. These are typically operated by National Scheme Operators (NSOs).

Each scheme assesses the environmental performance at each stage in the life cycle including:

- **BREEAM Communities** for the master-planning of a larger community of buildings.
- **BREEAM Infrastructure** for civil engineering, infrastructure, landscaping and public realm works.
- **BREEAM New Construction** for new-build domestic and non-domestic buildings.
- **BREEAM New Construction Residential** for new-build dwellings (in the UK only).
- **BREEAM In-Use** for existing buildings in operation.
- **BREEAM Refurbishment** for non-domestic building fit-outs and refurbishments.
- **BREEAM Fit Out** for non-domestic fit out projects.

The BREEAM certification process

BREEAM certification requires an asset to demonstrate how it performs against the standard appropriate for the relevant life cycle phase.

Independent BREEAM assessors – who are trained, qualified, and licensed by the organisation operating the applicable BREEAM scheme – can carry out a BREEAM assessment using the relevant scheme document and associated scoring and reporting tools. The assessor independently verifies performance of the asset against the applicable BREEAM standard and awards the score and associated rating.

The assessor submits their assessment to the organisation operating the applicable BREEAM scheme where it undergoes a rigorous quality assurance process. Only once the assessment has passed this process will the organisation operating the applicable BREEAM programme issue a BREEAM certificate. The BREEAM certificate provides formal verification that the assessor has assessed the building in accordance with the requirements of the scheme and its quality standards and procedures. For more information, please visit the BREEAM website (www.breeam.com).

A BREEAM certificate provides assurance that a building's BREEAM rating, at the time of certification, accurately reflects its performance against the BREEAM standard.

Interested parties can verify the BREEAM rating of a building by searching the BREEAM buildings listings on BREEAM Projects (www.breeam.com/projects).

SAMPLE

Figure 1: The BREEAM certification mark

National Scheme Operators (NSOs)

National Scheme Operators (NSOs) operate tailored, country-specific BREEAM schemes under licence from BRE Global. These organisations are selected to provide local knowledge, market presence and local stakeholder engagement through their governance structures.

The schemes developed by NSOs must comply with the requirements of the BREEAM Product Structure and the BREEAM NSO Process Manual to ensure high-level consistency across the development and operation of BREEAM schemes.

Local schemes must be used for assessments where they have been developed.

To understand which countries require the use of a local scheme, and the NSO which operates the scheme, please see Scope of BREEAM Fit Out on page 18.

Where a building falls outside of the scope of the NSO local schemes, or there is no local NSO operating in a country, the pan-country BREEAM International schemes (such as this one) are used. These are operated by BRE Global, who is also the NSO for BREEAM UK and BREEAM USA.

Ensuring quality and consistency

All BREEAM schemes are developed and operated by National Scheme Operators (NSOs) in accordance with the BREEAM Process Manual and Product Structure. These documents ensure that a common scientific and performance basis is used by all compliant schemes operated by NSOs, while ensuring that these are relevant to local demands, standards and practices.

To ensure competence, impartiality, and performance capability, all NSOs are required to maintain scheme operations to internationally agreed standards and seek accreditation from a national accreditation body.

BRE Global is certified to ISO 9001:2015 Quality management systems, the scope of which covers the operation of all BREEAM schemes. BRE Global maintains an impartiality committee to safeguard impartiality in the development and operation of BREEAM schemes.

BRE Global operates technical working groups, providing access to experts who can review BRE Global's standards and BREEAM schemes. These technical working groups ensure BREEAM's robustness from a scientific, technical and market perspective as well as ensuring the development of the standards and schemes is open to greater external and independent scrutiny.

BREEAM is a building level certification scheme and as such, there are no "BREEAM certified" products. BREEAM provides credits where the process, and in some cases the performance, meet a specific standard. It does not recognise specific products as "BREEAM compliant".

Value of data collection

The journey to obtaining a BREEAM rating begins with collecting quality data to measure, verify and understand the environmental impact of buildings. Effective data collection helps to:

- Verify that buildings meet the requirements for the certification standard.
- Inform business decisions that may impact sustainability risk and asset value.
- Demonstrate compliance with technical screening criteria in sustainable finance taxonomies being developed in multiple jurisdictions like the EU Taxonomy.
- Compare performance against other buildings in the sector.
- Set industry standards and encourage competition towards higher sustainability goals.
- Ensure transparency in the certification process.

When and how to engage with BREEAM Fit Out

Early engagement with the BREEAM Fit Out scheme and appointment of a licensed BREEAM Assessor is important to optimize sustainability performance of fit outs and ensure the requirements are delivered. At this early stage, the performance of the building and the desired BREEAM rating can be achieved in the most cost-effective way while there is greater flexibility and choice in design solutions and spending decisions.

Up-to-date listings of licensed BREEAM Assessors and credentialed BREEAM Advisory Professionals are available on BREEAM Projects (www.breeam.com/projects).

BREEAM primarily reflects the overall performance of the building rather than just the opportunities or limitations placed on specific stakeholders involved in the process. This means that the client, design team, principal contractor, as well as other specialist disciplines, have an important role to play throughout the renovation or fit out process, if the desired performance level is to be achieved and reflected through the certified BREEAM rating. The assessor verifies the impact of fit out decisions to the score and rating as the project progresses, ensuring that the implications of decisions made are understood by all parties.

Aligning the brief to meet the BREEAM requirements for the rating desired will simplify the assessment process and reduce risk. Clients and their project teams are encouraged to engage with a licensed BREEAM Assessor and BREEAM Advisory Professional no later than the Preparation and Brief stage (RIBA Stage 1 or equivalent). This will ensure that realistic targets are set and can be met, appropriate responsibilities can be defined and understood, and low or no cost solutions which deliver the most holistic sustainability benefits can be sought and applied wherever possible.

About this technical manual

This BREEAM technical manual has been created to:

1. Enable qualified and licensed BREEAM Assessors to complete BREEAM assessments and determine a rating.
2. Enable BRE Global to complete quality assurance reviews of a BREEAM Assessor's assessment, in accordance with the standards to which BRE Global is accredited.
3. Act as an aid for BREEAM Advisory Professionals (AP) to undertake project team facilitation, in terms of defining, monitoring and successfully achieving the desired BREEAM rating.
4. Act as a reference for clients and members of the project team whose proposed building is being BREEAM-assessed.

How to use this technical manual

This technical manual sets out the essential and in-depth requirements for this BREEAM scheme.

The technical manual is divided into the following sections:

1. Introduction
2. Scope
3. Scoring and rating, including minimum standards
4. Evidence requirements
5. Assessment issues, arranged in categories
6. Appendices
7. Checklists

The **scope** section describes the types of buildings and stages of assessment that this version of BREEAM can be applied to. The scope section can be used by clients and BREEAM Assessors to check whether this is the correct BREEAM scheme to use for a project.

The **scoring and rating** section illustrates how a building's assessed performance is measured and rated. It outlines the rating level benchmarks, the minimum standards for each rating level, and the category weightings. It also includes a description of the BREEAM assessment issues and credits awarded for the performance achieved (both standard and for innovation) and how the credits are used to calculate the score and the BREEAM rating.

The **evidence requirements** section provides guidance to assessors and project teams on the various types and forms of evidence required by the BREEAM Assessor to verify compliance with assessment criteria. This includes a description of why BREEAM requires an auditable trail of evidence.

The **assessment issues** section includes the individual BREEAM assessment issues, arranged in categories. Each issue defines a level of performance (the assessment criteria) against which the assessed building demonstrates compliance by providing evidence in order to achieve a corresponding number of available BREEAM credits.

While clients and their project team can pick and choose which issues to target in order to build their BREEAM performance score and achieve the desired BREEAM rating, the categories are weighted in the scoring methodology to encourage focus on performance that has the greatest impact to the overall sustainability performance of the asset. Minimum standards of performance are linked to some BREEAM ratings, ensuring that specific credits or criteria must be achieved in order to achieve those ratings. BREEAM's minimum standards are outlined in the Scoring and rating section. Clients and their project team should review these carefully when selecting a rating target.

The **appendices** and **checklists** provide supporting information for completing a BREEAM assessment.

Assessment issue structure

Each assessment issue is structured as follows:

1. **Issue title**: the assessment issue reference and title.
2. **Aim**: the objective of the issue and the impact it measures or mitigates.
3. **Overview**: the number of credits available for each assessment type and whether the issue forms part of the BREEAM minimum standards. For some assessment issues the number of credits available can also vary by building type. Assessment type and building type specific information is given in:
    a. **Assessment type specific notes**: information that affects specific assessment types (such as 'Part 1').
    b. **Building type specific notes**: information that affects the assessment of specific building types (such as 'Industrial' or 'Hotels').
    c. **Issue specific notes:** information that affects the applicability of an issue based on the features present in a particular asset (such as no water fittings being present).
4. **Assessment criteria**: the good and best practice performance level benchmarks and criteria. Where the building complies with the assessment criteria, as determined by the BREEAM Assessor, the relevant number of BREEAM credits can be awarded. Some issues have exemplary level criteria; where a building demonstrates that it meets exemplary level criteria, a BREEAM innovation credit can be awarded (for more details, refer to Inn 01 Innovation on page 305). Up to a maximum of 10 innovation credits are available.
5. **Methodology**: includes a description of any methodology used to determine the number of credits achieved for a given level of building performance. It includes, for example, calculation procedures or guidance on how to relate non-BREEAM schemes, standards or qualifications referenced to the assessment criteria.
6. **Compliance notes**: additional guidance that supports the application and interpretation of the main assessment criteria, including how to assess compliance in particular scenarios.
7. **Evidence**: describes the types of project information that the design team or client must provide to the licensed BREEAM Assessor to enable verification of the building's performance against the assessment criteria and justification of credits awarded.
8. **Definitions**: specific definitions of terms used in the assessment issue.

Some assessment issues also include:

9. **Checklists and tables**: a separate section for checklists or tables referenced in the assessment criteria. This can include tables of benchmarks or building type specific performance criteria. Some checklists are also included separately in a section after the appendices.
10. **Additional information**: further information relevant to the application of the assessment criteria, or sources of information that may be of use in addressing the issue.

Scope

Scope of BREEAM Fit Out

BREEAM Fit Out Commercial assesses the environmental life-cycle impacts of fit-out works in existing commercial buildings. It applies both to the first fit out of a newly constructed building and to projects involving remodelling, internal layout changes, or redecoration within an existing building.

This scheme is intended for projects where:

- The works are limited to interior design, including the installation of some or all local services.
- No demolition of structural elements is involved (although minor strip out works are permitted).

It is primarily designed for fit outs carried out to meet a tenant or end-user specification, rather than for full building refurbishments or installation of core building services.

Where the scope of works goes beyond the limitations above, a BREEAM Refurbishment assessment is required instead.

BREEAM Fit Out has two levels of assessment. For more information on the scope of works included in different levels in BREEAM Fit Out, see Assessment levels.

Scope of BREEAM Refurbishment and Fit Out

BREEAM Refurbishment and Fit Out V7 comprises two standards:

- BREEAM Refurbishment
- BREEAM Fit Out

These provide tailored pathways reflecting the differing responsibilities of building owners and occupiers and together enable the assessment of a wide range of projects, from whole-building refurbishments and system upgrades to interior-focused fit out works. The term “Refurbishment and Fit Out” is used as a collective descriptor for these standards.

When to use BREEAM Refurbishment or BREEAM Fit Out

BREEAM Refurbishment

BREEAM Refurbishment covers building upgrades that may include changes to the fabric, structure, core building systems and operational performance of an existing asset. It is typically used where work extends beyond individual spaces to improve the overall building’s performance and longevity. It is suitable for projects involving the major refurbishment or renovation of existing buildings, or the first-fit out of shell-only buildings.

The standard can be applied to projects covering any combination of Parts 1–4. However, it is not appropriate where the scope of works is limited solely to interior design (Part 4 only). In such cases, BREEAM Fit Out should be used.

BREEAM Fit Out

BREEAM Fit Out is designed for tenant-led or interior-focused projects where the wider building structure, fabric and core systems are not being significantly altered. It is suited to projects focused on the interior spaces within a building, including layouts, finishes, furnishings and localised services.

In scope terms the BREEAM Fit Out standard broadly aligns with the *Part 4: Interior design* elements of BREEAM Refurbishment, but can also include aspects comparable to *Part 3: Local services*.

Building location

BREEAM Fit Out Commercial is applicable to existing buildings in all countries, except where a licensed BREEAM National Scheme Operator (NSO) offers a country-specific local scheme that is appropriate. Where a country has an NSO offering a country-specific local scheme that is appropriate, the NSO scheme must be used. Countries with local schemes are listed in Table 1 below.

Table 1: Local schemes operated by National Scheme Operators

Country	Scheme operator	Local scheme
Sweden	Sweden Green Building Council (SGBC)	BREEAM SE
Spain	Technological Institute of Galicia (ITG)	BREEAM ES

Building types

Asset categories which can be assessed and rated using BREEAM Fit Out V7 are outlined in Table 2 below. A full list of asset types and sub-types can be found in Appendix A.

Table 2: List of building types covered under BREEAM Fit Out V7

Asset category
Commercial laboratory
Community
Culture and entertainment
Education
Government services
Healthcare
Hospitality
Industrial
Office
Residential institution
Retail
Sports and leisure
Transport hub

Bespoke assessment

For building types that are not listed in Appendix A, BRE offers a bespoke assessment service.

This service involves the building undergoing a scoping and tailoring exercise, from which BRE Global will identify the appropriate criteria to apply to the building, to facilitate a bespoke assessment and rating. Further guidance on this 'bespoke' process can be found in Guidance Note 23.

Mixed-use developments and building types

BREEAM defines different criteria and benchmarks for some assessment issues according to building type, function and use. A single building that includes different functions areas, e.g. office and retail, can be assessed under a single BREEAM assessment. Each area will need to comply with the relevant criteria for the building type. BREEAM credits that are awarded based on performance scales, such as Ene 01, Ene 02, Wat 01 and Mat 01, will be calculated on an area weighted basis.

Buildings that are a mix of commercial and residential asset types, and developments that include separate buildings with different function types, will need separate BREEAM assessments.

Further guidance can be found in Guidance Note 20.

Historic buildings

For the purpose of assessing historic buildings under BREEAM Fit Out Commercial V7, historic buildings are defined as:

Buildings or monuments that are formally listed and protected under international, national or local laws or schedules and therefore subject to local planning and building regulations, including buildings that are in a conservation zone. Such buildings will normally require consent from the local, national or international historic buildings authority.

Examples of historic building authorities include:

- UNESCO
- Architectes des Bâtiments de France (ABF)
- The National Heritage Board of Poland
- Listed buildings – Grade I, Grade II* and Grade II (England and Wales), Grade A, B and C (Scotland) and A, B1 and B2 (Northern Ireland)

Historic buildings can also be designated as part of a broader context, for example:

- Existing buildings situated in conservation areas (where the existing building itself has conservation status and contributes to the status of the conservation area)
- Existing buildings which are of architectural and historical interest, and which are referred to as a material consideration in a local authority's development plan
- Existing buildings designated as being of architectural and historic interest within national parks, areas of outstanding natural beauty, and world heritage sites.

Within this scheme document, there are a number of compliance notes that should be referred to where undertaking an assessment of a historic building.

Similar building types (or units) on the same site

It is possible to assess and rate a number of separate but similar non-residential buildings, or individual units within a larger building development, within one BREEAM assessment report. Further guidance on this type of assessment can be found in Guidance Note 20.

Assessment levels

BREEAM Fit Out Commercial V7 comprises two levels of assessment, enabling a clear distinction between fit-out projects that are limited to interior design works and those that also include the installation of local building services.

Level 1: Fit out – Interior design works

Level 1 applies to projects that include interior fit-out or remodelling works only, with no installation or modification of building services.

The scope may include the following elements (aligned with Part 4 of BREEAM Refurbishment):

- Wall finishes
- Floor coverings
- Ceiling finishes
- Partitions
- Raised floor systems
- Furniture and fittings (e.g. office furniture, retail display units)

Level 2: Fit out – Interior design works and local building services

Level 2 applies to projects that include interior design works together with the installation of local building services.

In addition to the elements listed under Level 1, the scope of works in Level 2 will include some or all of the following local services. Where only certain services are included, the applicability of relevant BREEAM credits can be filtered accordingly.

- Local heating units (including systems not connected to core services)
- Local cooling units (including systems not connected to core services)
- Internal lighting systems, including controls
- Local ventilation systems
- Sanitary fittings (e.g. tea points, kitchenettes, tenant-area washrooms)
- External lighting systems
- Local electrical installations (e.g. small power, sub-metering)
- Equipment (e.g. office equipment, display lighting, display refrigeration units)
- Security and access control systems
- Fire detection systems
- Network and communications infrastructure

Assessment stages

BREEAM Fit Out can be used to assess and rate the environmental impacts arising from a fit out at the following project stages:

1. Design stage (DS) (optional) – leading to an interim BREEAM rating and certificate of assessment.
2. Post-construction stage (PCS) – leading to a final BREEAM rating and certificate of assessment.

Design stage

The design stage (DS) assessment and interim BREEAM rating is optional and can be used to demonstrate the proposed performance at the design stage of the life cycle. It is strongly recommended that assessment and certification should occur prior to the beginning of operations on site. The BREEAM rating at this stage is labelled as 'interim' because it does not represent the final BREEAM performance.

To complete an assessment at this stage, the design must be advanced to a point where the relevant design information is available to enable the BREEAM Assessor to evaluate and verify the performance against the criteria defined in this scheme document. The interim DS assessment will therefore be completed and certified at the scheme design or detailed design stages.

Post-construction stage

The post-construction stage (PCS) assessment and BREEAM rating is a mandatory certification stage that can be used to demonstrate the final 'as-built' performance. A final PCS assessment is completed and certified after practical completion of the works.

There are two approaches to assessment at the post-construction stage:

1. A post-construction review (PCR), based on a completed interim design stage assessment
2. A standalone post-construction assessment (PCA).

A PCR serves to confirm the assessment of 'as-built' performance and rating and where appropriate that it is in accordance with the assessment certified at the interim design stage. Where an interim DS assessment has not been carried out and a BREEAM assessment and rating is required, a full post-construction stage assessment can be conducted.

Building life cycle stages not covered

BREEAM Fit Out is not designed to assess the environmental impacts of:

- Newly constructed buildings (see BREEAM New Construction)
- Existing building refurbishments (see BREEAM Refurbishment)
- Existing buildings in operation or existing unoccupied buildings (see BREEAM In-Use)
- Masterplanning projects (see BREEAM Communities)
- Infrastructure projects (see BREEAM Infrastructure)

Scoring and rating

Rating benchmarks

There are a number of elements that determine the overall performance of a project assessed using BREEAM:

1. The scope of the assessment
2. The BREEAM rating level benchmarks
3. The minimum BREEAM standards
4. The category weightings
5. The BREEAM assessment issues and credits

How these elements combine to produce a BREEAM rating for a project is summarised in the following sections. This is followed by a description and example describing the methodology for calculating a rating.

The BREEAM rating benchmarks for projects assessed using BREEAM Fit Out V7 are shown in Table 3 below.

Table 3: BREEAM rating benchmarks

BREEAM rating	Overall score
Outstanding	≥ 85%
Excellent	≥ 70%
Very Good	≥ 55%
Good	≥ 40%
Pass	≥ 25%
Unclassified	< 25%

The BREEAM rating benchmarks enable a client and all other stakeholders to compare the performance of a building with other BREEAM rated buildings of the same type, and the typical sustainability performance of a stock of buildings.

In this respect each BREEAM rating broadly represents performance equivalent to:

1. Outstanding: Less than the top 1% of buildings (innovator)
2. Excellent: Top 10% of buildings (best practice)
3. Very Good: Top 25% of buildings (advanced good practice)
4. Good: Top 50% of buildings (intermediate good practice)
5. Pass: Top 75% of buildings (standard good practice)

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

Minimum standards

To maintain a flexible system BREEAM adopts a 'balanced scorecard' approach to the assessment and rating of a project. This means that to achieve a particular level of performance the majority of BREEAM credits can be traded, i.e. non-compliance in one area can be offset through compliance in another to achieve the target BREEAM rating.

However, to ensure that performance against fundamental environmental issues is not overlooked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas, e.g. energy, water, waste etc. It is important to bear in mind that these are minimum acceptable levels of performance and in that respect they should not necessarily be viewed as levels that are representative of best practice for a BREEAM rating level.

To achieve a particular BREEAM rating, the minimum overall percentage score must be achieved and the minimum standards, detailed in Table 4 below, applicable to that rating level complied with.

Table 4: Minimum BREEAM standards by rating level

BREEAM issue	Minimum standards by BREEAM rating level				
	Pass	Good	Very Good	Excellent	Outstanding
Man 03 Responsible construction	**National health and safety legislation is met** Criterion 2			**Basic responsible construction practices** One credit (Responsible construction management)	**Advanced responsible construction practices** Two credits (Responsible construction management)
Man 04 Commissioning and handover			**Commissioning of building systems** One credit (Schedule and responsibilities) **Technical and non-technical building user guide written** Criterion 8 (Handover)		
Man 05 Aftercare				**Commitment to 12 month in-use commissioning** One credit (In-use commissioning)	
Hea 04 Indoor air quality	**No asbestos used** Criterion 1		**Indoor air quality plan** Criterion 2		
Ene 01 Energy and carbon performance for regulated energy uses				**Calculated energy performance improvement** 42% of available credits achieved (EPR_{RFO} = 0.4167)	**Calculated energy performance improvement** 67% of available credits achieved (EPR_{RFO} = 0.6667)
Ene 02 Prediction of operational energy and carbon					**No fossil fuel use by in-scope building services and equipment** Criterion 7
Wat 01 Water consumption		**15% improvement over baseline** Criteria 1–3			**30% improvement over baseline** Criteria 1–3
Mat 01 Building life cycle assessment				**Any project stage LCA and embodied**	**All project stage LCA and embodied**

BREEAM issue	Minimum standards by BREEAM rating level				
	Pass	Good	Very Good	Excellent	Outstanding
				carbon reporting Criteria 1–6	**carbon reporting** Five credits (Criteria 1–6)
Mat 03 Responsible sourcing of construction products	**Legally harvested and traded timber** Criterion 1				
Wst 01 Construction waste management					**Pre-fit-out resource audit** One credit OR **Resource management plan** One credit (Construction resource efficiency)
Pol 01 Impact of refrigerants					**No refrigerant use** Three credits (No refrigerant use) OR **Refrigerants have an emissions rate < 1000 $kgCO_2e$ per kW** One credit (Impact of refrigerant)

Category weightings

Category weightings provide a means of defining, and therefore ranking, the relative impact of environmental categories.

An example of the category weightings for BREEAM Fit Out V7 are displayed in Table 5.

The weightings used for BREEAM Fit Out assessments are based on the specific credits available compared to the maximum available for the category. Therefore, the weightings applied within the BREEAM Platform depends on the scope of the assessment: the applicable assessment level and any 'scope dependent' issues or credits.

This means the weightings displayed and applied to an assessment in the BREEAM Platform may differ significantly from the example weightings given in Table 5 below.

Table 5: Example category weightings for BREEAM Fit Out V7 (Italy)

Category	Core weightings
Management	11.00%
Health and wellbeing	19.50%
Energy	18.50%
Transport	11.50%
Water	12.00%
Materials	16.50%
Resilience	0%
Waste	7.00%
Land use and ecology	0%
Pollution	4.00%
Total	100.00%
Innovation (additional)	10.00%

Each category in BREEAM consists of a differing number of assessment issues and credits (as defined in the technical sections of this document).

The weightings given in Table 5 above are an example of the core weightings for BREEAM Fit Out assessments. The actual weightings used in an assessment will vary based on the applicable assessment level and the specific assessment issues and credits that are in scope.

Adaptation of weightings for local conditions

The weightings are adapted for local conditions, this is done for the first project that registers for assessment in a new country or region. The weightings are set for that project and all other projects thereafter in that country or region for the life of that BREEAM Refurbishment Fit Out version. The development of these weightings is based on robust and independent information provided by 'local experts' who have an understanding of local conditions. This may be a member of the design team, if they can demonstrate sufficient knowledge of the environmental conditions of the region or country, or another individual or organisation with the relevant expertise.

The BREEAM Assessor completes the 'BREEAM International V7 Weightings Questionnaire' (available from BREEAM Projects) and submits it to BRE Global, who use the information to set appropriate weightings for that country or region.

The weightings are tailored based on the technical categories, with categories being considered 'Fixed' or 'Variable'. Fixed categories are those defined as having a universal impact, independent of the local context (for example, Management). Variable categories are those defined as being variable locally, due to social, environmental, political or economic factors (for example, Water and Energy). BRE Global will take account of these factors when determining the relative importance of the environmental categories.

Assessment issues and credits

BREEAM Fit Out Commercial V7 consists of 34 individual assessment issues across ten environmental categories, plus an eleventh 'Innovation' category. Each assessment issue addresses a specific building related environmental impact or issue and has a number of credits assigned to it.

BREEAM credits are awarded where a development meets the best practice performance levels defined for an assessment issue, i.e. it has mitigated an impact or, in the case of Health and wellbeing on page 72, addressed a specific building occupant-related issue, e.g. good thermal comfort, daylighting, or acoustics.

The number of credits available for an individual assessment issue will vary and generally reflect the importance of mitigating the impact of the assessment issue. In most cases, where there are multiple credits available, the number awarded is based on a sliding scale or benchmark, where progressively higher standards of building performance are rewarded with a higher number of credits.

It is worth noting that, in addition to the category scores and overall score and BREEAM rating, verified performance against individual assessment issues also provides users with a credible set of key building performance indicators for a range of embodied, operational and construction phase building impacts. In this respect, in addition to using BREEAM to define overall targets, it is possible to use the method to define performance levels in support of specific organisational policy objectives for individual environmental issues. Care should be taken when setting design targets using individual issues and credit levels in this way as it can limit design flexibility and have an impact on project costs.

Awarding credits for innovation

One of the aims of BREEAM is to support innovation within the construction industry and its supply chain. "Innovation" credits recognise sustainability benefits or performance levels that go beyond standard BREEAM assessment issues and criteria.

Awarding credits for innovation enables clients and design teams to boost their building's BREEAM performance and, in addition, helps to support the market for new innovative technologies, and design or construction practices.

BREEAM awards 'innovation credits' in two ways. First, by meeting exemplary performance criteria defined within an existing BREEAM issue, i.e. going beyond the standard BREEAM assessment criteria and therefore best practice. Not all assessment issues have exemplary performance criteria. Second, where an application is made to BRE Global by the registered project's BREEAM Assessor to have a particular building technology or feature, design or construction method or process recognised as 'innovative'. If the application is successful and subsequently compliance is verified, an 'Approved Innovation credit' can be awarded.

An additional 1% can be added to a building's overall score for each 'innovation credit' achieved. The maximum number of 'innovation credits' for any building is 10; therefore the maximum available additional score for 'innovation' is 10%. The building's final BREEAM score will be capped at 100%. Innovation credits can be awarded regardless of the building's final BREEAM rating, i.e. they can be awarded at any BREEAM rating level. For more detail, refer to Inn 01 Innovation on page 305.

Local codes and standards

Use of local codes and standards

Certain criteria in BREEAM require compliance with specified standards or best practice documents. In some countries there may be local equivalents of these standards and in these cases BREEAM Fit Out allows BRE Global staff, with support from assessors and the project team, to review the local standards against BREEAM specified requirements and confirm their equivalence. The assessors need to send in the local standards to BRE Global for approval. Ideally the relevant sections of the standards will be translated into English; however, BRE Global can also provide this service for a fee.

If BRE Global approves the standard as equivalent, the local standard will form part of the approved standards for that country, region or area.

The individual requirements for a particular local standard and a list of approved standards are provided in the Approved Standards List (ASL).

For each BREEAM criterion requiring compliance with specified standards or best practice documents a combination of the following situations are likely, as circumstances vary between issues:

1. **Issue is not targeted (or not applicable) or pre-approved standards are used** – the standards section in the specific issues in the ASL does not have to be completed. Where a pre-approved standard is used, within the Assessor's commentary section in an issue in the BREEAM Platform, clear referencing should be present indicating where the standard has been included in the evidence. If a QA Auditor cannot confirm which standard has been used in the evidence and that the used standard is approved, this can result in a non-conformance
2. **Unapproved local standard is proposed** – at the earliest opportunity the project team informs BRE Global that they will be working to (as yet unapproved) local standards. The team will need to send the relevant sections of the standard to BRE Global, translated into English (if applicable).

   Note: The approvals process for local standards happens at the very early stages of a project assessment, i.e. well before a report is submitted for certification so that:

   a. Certification is not delayed, and
   b. The project team or client have certainty over which approved standards against which their building's performance is being assessed.

   If BRE Global approves the local equivalent, it is added to the 'approved standards' for that country or region.

More details on this process can be found within the BREEAM Operations Manual (SD5070), available on BREEAM Projects.

Calculating a BREEAM rating

A BREEAM Assessor must determine the BREEAM rating using the BREEAM Platform.

The process of determining a BREEAM rating is outlined below and an example calculation included in Table 6.

1. Determine the scope of the project being assessed.
2. The BREEAM Assessor will then award credits in accordance with the criteria of each assessment issue (as detailed in the technical sections of this document).
3. The percentage of credits achieved is then calculated for each category.
4. The percentage of credits achieved in each section is multiplied by the category weighting, giving the overall category score.
5. The category scores are added together to give the overall BREEAM score.
6. The overall score is then compared to the BREEAM rating benchmark levels and, provided all minimum standards have been met, the relevant BREEAM rating is achieved.
7. An additional 1% can be added to the final BREEAM score for each 'innovation credit' achieved (up to a maximum of 10% and with the total BREEAM score capped at 100%).

Table 6: Example BREEAM score and rating calculation for a Level 2 office fit-out in Italy assessed using BREEAM Fit Out V7

Category	Credits achieved	Credits available	Credits achieved, %	Category weighting	Category score, %
Management	8	14	57.14	0.132	7.54
Health and wellbeing	12	19	63.16	0.212	13.39
Energy	4	9	44.44	0.087	3.87
Transport	7	10	70.00	0.138	9.66
Water	2	3	66.67	0.108	7.20
Materials	6	11	54.54	0.198	10.80
Resilience	-	-	-	-	-
Waste	7	8	87.50	0.084	7.35
Land use and ecology	-	-	-	-	-
Pollution	6	7	85.71	0.042	3.60
Innovation	0	10	0.00	0.100	0.00
Final BREEAM score					63.41
BREEAM rating					VERY GOOD

Table 7: Minimum standards for a BREEAM Very Good rating

Minimum standards for BREEAM 'Very Good' rating	Achieved?
Man 03 Responsible construction	Yes
Man 04 Commissioning and handover	Yes
Hea 04 Indoor air quality	Yes
Wat 01 Water consumption	Yes
Mat 03 Responsible sourcing of construction products	Yes

Evidence requirements

This section provides guidance to assessors and project teams on the types of evidence required to demonstrate compliance with BREEAM issues.

The BREEAM Assessor role

The role of the BREEAM Assessor is to objectively assess performance of an Asset against the BREEAM scheme and to gather project information to demonstrate compliance. To award a BREEAM credit, the assessor must be satisfied that the evidence gathered demonstrates unambiguous compliance with all relevant criteria defined in the BREEAM scheme. All evidence must be referenced appropriately by the assessor in the BREEAM Platform for quality assurance checks.

Clear and concise validation statements, referencing the evidence, must be provided for each BREEAM issue to demonstrate how each of the criteria have been addressed and credits awarded. This facilitates efficient quality assurance and certification decisions.

The BREEAM Assessor determines the BREEAM rating and their BREEAM Platform submission is the formal record of an assessor's audit against the criteria defined in the technical manual for a BREEAM scheme. The BREEAM certificate issued by BRE Global provides assurance that the service provided by the assessor, i.e. the assessment and determination of the BREEAM rating has been conducted in accordance with the requirements of the scheme.

Evidence types

Evidence does not necessarily need to be prepared specifically for the purpose of the BREEAM assessment. In many instances, the assessor should source readily available and prepared project information to demonstrate compliance. A list of common evidence types is provided in Table 8 on page 32.

Evidence must be provided to verify compliance with the relevant criteria for every BREEAM credit awarded by the assessor. Evidence should also be provided to justify when credits have been filtered out of a BREEAM assessment.

The BREEAM Assessor and project team will find that many assessment issues require more than one piece or type of information to demonstrate compliance with one criterion. Alternatively, one piece of information may be sufficient to demonstrate compliance with multiple criteria.

Acceptance of alternative forms of evidence

The Technical Manual sets out the evidence required for each issue, indicating which evidence is deemed to satisfy the evidential requirements and demonstrating that the criteria have been met. Each applicable evidence item is expected to be provided by the Client and submitted to QA by the Assessor as part of the certification process.

However, the Schedules of Evidence only provide a guide to help the assessor identify what types of supporting evidence are deemed acceptable for each issue or criterion.

Alternative evidence may be submitted without engaging the BREEAM Technical team via a Technical Query, provided it:

- clearly demonstrates compliance
- is referenced appropriately
- supports the assessor's justification for awarding the credit

Where alternative forms of evidence are submitted, the assessor must be satisfied that they meet the BREEAM Evidence Principles and are credible, robust, and traceable to the same assurance level as, or better than, specified evidence types defined in the technical manual. Where this is not the case, the Quality Assurance audit will identify it as a non-conformance, and a certification decision will be delayed until such time as the non-conformance is addressed.

Written commitments at the interim stage of assessment (design stage)

At the interim design stage of assessment, letters or emails to demonstrate intent to comply with BREEAM criteria can be used, provided they meet the requirements for communication records. Such evidence must make clear the actions that will be undertaken and evidence that will be provided, i.e. the commitment to ensure the project's compliance, particularly at the final stage of assessment. The party who makes the commitment must be clearly aware of the actions and evidence that needs to be undertaken and supplied to demonstrate compliance with BREEAM at the final stage of assessment. For example, in many circumstances it would not be acceptable for the design team to simply copy and paste the BREEAM criteria into a written commitment (BREEAM criteria do not generally prescribe solutions). The commitment should specifically detail how criteria are to be achieved (the solution) in the context of the assessment, and often copying and pasting the BREEAM criteria will not provide this detail. This therefore does not demonstrate the degree of confidence in the solution necessary for certification.

While letters of commitment can play a role in demonstrating compliance, they are not a replacement for more formal and established types of project information. The assessor must not award credits where they have a reason to doubt the validity or intent of written commitments, or where it is reasonable to expect formal design or specification information to be available to confirm compliance.

The evidence schedules are generally based upon submission of the assessment at Technical Design. Where submission is required to take place at an earlier stage, when some design information may not be advanced enough to satisfy all of the BREEAM design stage requirements, we request assessor’s provide justification for the early submission and alternative evidence must be robust and contractually binding.

The assessor must ensure that the evidence used is the most robust available for the project stage at the time of submission and therefore, should not always accept letters of commitment at design stage where more detailed design evidence is expected to be available.

Written commitments at the final stage of assessment (post-construction stage)

Two types of assessment can be carried out at the post-construction stage, a post-construction review of a design stage assessment, or a post-construction assessment where no design stage assessment has been carried out. The 'Final post-construction stage' column of the evidence table in each issue assumes that a design stage assessment has been completed and certified. Where a design stage assessment has not been completed, the assessor will need to review both the 'Interim design stage' and 'Final post-construction stage' evidence listed in the evidence table and ensure sufficient evidence is submitted with the assessment to demonstrate compliance with the criteria.

Evidence supplied at the post-construction stage must reflect the completed building and must therefore demonstrate what has actually been implemented. For example, if sub-meters have been specified at the design stage, evidence at the post-construction stage would need to demonstrate that these have actually been installed. Appropriate evidence may be a site inspection report with supporting photographs or final construction drawings or equivalent showing the location of the sub-meters. Where commitments or contract clauses rather than full design information was used to demonstrate compliance at design stage, or the design information is superseded, more detailed evidence will be required post-construction to confirm the final detailed design as well as verification that it has been implemented.

Letters of commitment cannot be used to demonstrate compliance at the final, post-construction stage of assessment. The only exception to this is where the criteria require an action to take place after handover and possibly during the initial stages of building operation, i.e. after completion of the post-construction stage of assessment. An example could be a written commitment from the building owner or occupier making a commitment to conduct post occupancy evaluation.

List of common evidence types

Table 8: Evidence types

Document or evidence type	Description and notes
As constructed information	Information produced at the end of a project to represent what has been constructed. This will comprise a mix of 'as-built' information or drawings and surveys from specialist subcontractors and the 'final construction issue' from design team members.
BRE Global correspondence reference number	For example, the reference number for a BRE Global response to an assessor's technical query.
BREEAM Assessor's site inspection report	A formal report based on the BREEAM Assessor's own survey of the site or building to confirm compliance with BREEAM criteria. This must include site photographs, which are linked to specific criteria, to verify the that the building has been constructed in line with the design specification or drawings provided.
Building contracts	The building contract (or excerpts or clauses from it) between the client and the contractor for the construction of the project. In some instances, the building contract may contain design duties for specialist subcontractors or design team members.
Building information model (BIM)	The BIM (or BIM files) used for the project containing relevant information or evidence of compliance.
Certificates of compliance (third party)	Examples include ISO 14001, BES 6001, FSC (Forest Stewardship Council), EPC (environmental profile certificate), EPD (environmental product declaration), Considerate Constructors etc.
Communication records	Formal communication records between or from relevant project stakeholders or other third parties confirming an appointment, action or outcome. This may be in the form of a letter, meeting minutes, email correspondence, publication or another form of media (see also additional guidance on following pages).
Communication strategy	The strategy that sets out when the project team will meet, how they will communicate effectively and the protocols for issuing information between the various parties, both informally and at information exchanges.
Construction specification	The specification for the project or building. For the purpose of BREEAM, the specific clause of the specification must be referenced within the report.
Construction stage data and information	For example, purchase orders, metering data, log books, commissioning records, reports etc.
Cost information	Project costs, including the cost estimate and life cycle costs.
Design drawings	Developed Design and Technical Design, including the coordinated architectural, structural and building services design, site plans, drainage designs. All drawings have the building or site name, phase (if applicable), title of drawing, author, date, revision number and a scale.
Design programme	A programme setting out the strategic dates in relation to the design process. It is aligned with the Project Programme but is strategic in its nature, due to the iterative nature of the design process, particularly in the early stages.
Design responsibility matrix	A matrix that sets out who is responsible for designing each aspect of the project and when. This document sets out the extent of any performance-specified design.
Feasibility study	Studies undertaken to test the feasibility of the Initial Project Brief for the site or in a specific context and to consider how site-wide issues will be addressed.
Formal correspondence	The document should be on company or organisation letterhead and include a signature (electronic signatures are acceptable). The document should be secured to prevent unauthorised access or modification. Though, where letters are provided as attachments to emails which are presented in their original format, offer a clear auditable trail and are provided by appropriate team members, the assessor can use their judgement on the robustness of the document. For further details, please refer to the sections on written commitment.

Document or evidence type	Description and notes
Meeting minutes	Include date, location and attendee information (names, organisations and roles), along with a record of the meeting and agreed actions.
Modelling results and outputs	Examples include thermal modelling, flooding, life cycle assessment, life cycle costing, ventilation modelling etc.
Other third-party information	For example, maps, public transportation timetables, product data or details, manufacturers' literature, government or EU standards or codes, EU labelling.
Professional services contract	An agreement to provide professional or consulting services such as designing, feasibility studies, or legal or technical advice.
Professional specialist reports	Professional reports resulting from specialist surveys, studies or test results, e.g. contaminated land, ecology, flood risk assessment, surface water run-off report, site investigation, acoustics, indoor air quality plan, low and zero carbon technologies study, transportation analysis, commissioning reports, passive design analysis report, free cooling analysis report, life cycle assessment, landscape and habitat management plan etc.
Project Execution or Quality Plan	The Project Execution Plan is produced in collaboration with the project lead and lead designer, with contributions from other designers and members of the project team. The Project Execution Plan sets out the processes and protocols to be used to develop the design.
Project programme	The overall period for the briefing, design, construction and post-completion activities of a project.
Project roles table	A table that sets out the roles required on a project as well as defining the stages during which those roles are required and the parties responsible for carrying out the roles.
Project strategy	The strategies developed in parallel with the Concept Design to support the design and, in certain instances, to respond to the Final Project Brief as it is concluded. Examples include strategies for sustainability, acoustics, handover, maintenance and operational, fire engineering, building control, technology, health and safety, construction, travel plan, sustainable procurement plan.
Risk assessment	The risk assessment considers the various design risks and other risks on a project and how each risk will be managed and the party responsible for managing each risk.
Schedule of services	A list of specific services and tasks to be undertaken by a party involved in the project which is incorporated into their professional services contract.
Strategic or initial project brief	The brief prepared following discussions with the client to ascertain the project objectives, the client's business case and, in certain instances, in response to site feasibility studies.

Evidence principles

To determine whether evidence types are appropriate for an assessment issue, the BREEAM Assessor must consider the BREEAM evidence principles in Table 9 below. Where the 'evidence types' meet the principles outlined in Table 9 below and the guidance provided in the 'robustness of evidence' section, where appropriate, such evidence is admissible for the assessment and the BRE Global Quality Assurance audit.

These principles are not listed in a hierarchical order and are all equally important when considering which evidence type to assess, reference and submit.

Table 9: BREEAM evidence principles

Principle	Objective	A question to ask to check
1. Evidence for all criteria and all credits sought		
Evidence demonstrates that ALL relevant criteria and sub-criteria are achieved for each credit sought and where relevant, is provided to support compliance notes, definitions etc. Where the assessor or design team deem specific criteria not relevant to the assessment, a full justification should be collated and then submitted as a technical query for review by BRE Global.	Completeness	Are all criteria covered? Have all relevant compliance notes, knowledge base entries (KBCNs) and definitions been addressed?
2. Unambiguous assessment		
The assessment demonstrates unambiguous compliance and the evidence supports this assessment. Evidence (and supporting notes) clearly demonstrate to a third-party reviewer that the criteria have been met.	Independent review compatibility	Would a third party (e.g. BRE Global) come to the same assessment decision as me based on the evidence submitted?
3. Robust		
Always ensure the evidence type selected is robust and relevant to the stage of assessment. Evidence selected contains all relevant basic information along with robust constituent parts that are needed. (For further details, see Robustness of evidence below.)	Proof that evidence is robust and from a reliable source	Using an assessor's judgement, is the evidence robust enough to demonstrate compliance with the criterion? Does the evidence contain all the relevant basic information? Does it provide a fully auditable trail of compliance?
4. Use existing evidence		
Use existing project information to demonstrate compliance. A significant proportion of the evidence should not need to be 'created' for BREEAM compliance purposes.	Minimises evidence and reduces time and cost of compliance	Does an existing type of project information robustly demonstrate compliance for the credits sought?

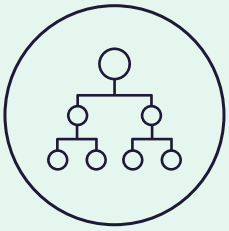
Robustness of evidence

Robust evidence provides confirmation that the assessment has been carried out correctly and the building complies with the criteria for the BREEAM credits sought. The assessor should consider the following when gathering project information and evaluating whether the evidence provided is as 'robust' as possible:

- Is there more than one piece of evidence that could be used to demonstrate compliance?
- Is the chosen evidence robust and appropriate to demonstrate that a particular criterion has been achieved?
- Is there a clear auditable trail with the document including key information such as the project name, the author, date, revision numbers (etc.)?

Any evidence submitted for a BREEAM assessment must be robust in terms of its source and its traceability. As a minimum, the assessor should identify within their validation statement the relevant page numbers, both of the document and if applicable PDF, and sections for the document where compliance has been confirmed.

Management



Summary

This category encourages the adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare activities to ensure that robust sustainability objectives are set and followed through into the operation of the building. Issues in this section focus on embedding sustainability actions through the key stages of design, procurement and initial occupation from the initial project brief stage to the appropriate provision of aftercare.

Assessment issues

Man 01 Project brief and design	2 credits
Man 02 Life cycle cost and service life planning	2 credits
Man 03 Responsible construction	5 credits
Man 04 Commissioning and handover	3 credits
Man 05 Aftercare	2 credits + 1 exemplary

Man 01 Project brief and design

(all buildings)

Aim

To promote an integrated, collaborative design process that embeds sustainability objectives from the outset, optimises fit-out performance, and ensures outcomes reflect stakeholder needs and intended use.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
2.0	**Small-scale projects** For small-scale projects, a BREEAM Assessor can act as the BREEAM Advisory Professional (AP), without being a registered BREEAM AP. In this case, potential and actual conflicts of interest must be identified by the assessor and acknowledged in a written statement submitted alongside the assessment.

Assessment criteria

One credit – Project planning

1 At the start of the design process, a specific project delivery workshop, in line with the requirements set out within M1.1, is held with the project team (Client, Design Team, end user (where known), building management representative (where known) and Principal Contractor (see M1.2 where not yet appointed)) to ensure:

1.a The project team has a clear understanding of the project aims, client's needs and expectations. This should include a review of lessons learnt from similar previous projects, to inform decisions.

1.b Specific end user requirements are determined.

1.c Success criteria, performance targets and evaluations methods are set.

1.d Any project constraints are understood.

2 At post-construction, project performance must be reviewed against the established success criteria and performance targets to assess how effectively the building delivered on its original design intent.

One credit – BREEAM AP

3 A BREEAM Advisory Professional (AP) has been appointed to facilitate setting and achieving BREEAM performance targets for the project. Their involvement must be early in the design process (see M2.2) to:

3.a Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout the design process.

3.b Monitor progress against the agreed performance targets throughout all stages after their appointment where decisions critically impact the specification and tendering process and the BREEAM performance.

3.c Proactively identify risks and opportunities related to achieving the agreed targets.

3.d Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets.

3.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.

4 The defined BREEAM performance targets have been formally agreed between the client and the design or project team at the beginning of the design process.

5 The BREEAM AP must attend regular key project and design team meetings during the design stages and where applicable this should include the concept design, developed design and technical design work stages. Reporting must be carried out during and prior to completion of each stage of the design as a minimum.

6 To achieve this credit at the interim design stage assessment, the agreed BREEAM performance targets must be demonstrably achieved by the project design. This must be demonstrated via the BREEAM Assessor's design stage assessment report.

Methodology

M1: Project planning

M1.1: Project delivery workshop

The intention of the workshop is to ensure all parties understand the client's requirements and purpose of the project. The workshop must be well-structured, and the outcomes clearly documented together with quantitative or qualitative targets to enable the project success to be measured. The workshop must cover the discussion points set out within Table 10 below.

Where discussion points are confirmed as not applicable to the specific project, a statement to confirm this must be provided i.e. It is confirmed there are no legal constraints that need to be considered.

Where items under the discussion points are still to be verified, such as the results of any surveys/risk assessments; it must be stated what actions are required, who has responsibility and the planned timeframe for completion. When the outcomes become available, this information can be conveyed at the next evaluation workshop and updated within the meeting records. The document can be developed with each stage of the project.

The 'examples of what should be covered', are to give guidance only for the type of information that could be covered against the discussion points.

The aim is to encourage the project to clearly define the success criteria and objectives for the project at an early stage so that the project team can track progress and measure their successfulness in achieving the project performance objectives. Where these are not achieved, this does not preclude the award of the credit, but in such instances, it must be analysed why they were not achieved and what could be done better in future.

Table 10: Discussion points for project delivery workshop

Item	Discussion points	Examples of what should be covered
A	Aims of the project	What is the building purpose and function? Does the client have any specific needs and expectations for the outcomes of the project such as quality of design and finishes, standard of workmanship required, aspirations for a high level of innovativeness or sustainability? Are these realistic in terms of the budget and timescales for the project?
B	Project success criteria	What are the defined success criteria and performance objectives for the project? How will these be measured? These could include any of the following (the list is a guide only and not definitive): 1. Meeting project delivery objectives a. On time

Item	Discussion points	Examples of what should be covered
		b. On budget 2. Achieving quality standards a. Zero defects on building handover b. Low defects in use 3. Delivering on design goals a. Project aims and requirements are achieved b. Building is fit for purpose c. Performance gap between the design expectations and the operational performance is reduced 4. Client satisfaction a. Expectations and needs are met/exceeded b. Client, user and stakeholders are happy with the results 5. Successful project management a. Good health and safety record b. Smooth/clean/tidy site c. Responsible/considerate construction management d. Minimal changes/disputes 6. Environmental performance a. See sustainability objectives (section E) b. Social impact – does it contribute positively to the community and social needs?
C	End user requirements	Confirmation of any operational outcomes, space requirements, thermal comfort requirements, specific design needs or any specialised plant and equipment that is necessary (where these are extensive, this may include a reference to another document such as room data sheets). There may also be specific requirements for robustness, safety or security that need to be considered.
D	Review of lessons learnt from previous similar projects	Such as occupant behaviour, how successful the control strategies were or any maintenance issues. For some projects such as those with very particular requirements or functions, this might include arranging visits to similar existing buildings to identify what has worked well and what improvements would be beneficial. This is discretional.
E	Sustainability objectives for the project – *Must include the BREEAM performance rating and at least three more specific targets*	To include measurable targets. This must include an overall building environmental assessment performance target such as required BREEAM rating, and at least three more specific targets. These could include for example: operational energy or water consumption performance targets, embodied carbon emissions, responsible sourcing of materials, material efficiency and construction waste arisings.
F	Technical constraints on the project	Specific requirements relating to building functionality or specific technical equipment required.
G	Construction constraints and considerations	Such as space, deliveries or noise restrictions and buildability issues
H	Legal constraints	Such as local building regulations or heritage requirements or party wall agreements which may impact the outcomes.
I	Designing for ease of commissioning	Identify any complex systems or equipment which will require specialist input or any interfaces between different systems. Consider appointment of a commissioning manager.
J	Designing for maintainability	Ensuring that consideration is given to maintenance access requirements together with the budget and technical expertise of the facilities management team who will be maintaining any proposed systems
K	Handover requirements	Process for commissioning, snagging, handover, training and end user documentation.
L	Aftercare requirements	Requirements for aftercare provision, in-use commissioning or post occupancy evaluation.
M	Performance risk	Developed for the success criteria identified at the initial workshop and used to track

Item	Discussion points	Examples of what should be covered
	register	progress throughout the project. This should include qualitative and quantitative targets for both the project aims and sustainability objectives.

M1.2: Contractor involvement

The Principal Contractor's knowledge and experience can play an important role in the project planning stage, advising on the practicality and buildability of the design proposals, along with any potential impacts on programme or budget. In situations where the Contractor is still to be appointed at the time of the initial project delivery workshop (criterion 1), the project team must still give consideration to any potential buildability issues. For larger or more complex projects, where this input could be invaluable, the project team must appoint another party to perform this role on the Contractor's behalf. Where there is someone within the project team with substantial construction management or contracting experience already, such as the Project Manager, a separate appointment would not be required. This is not required for those projects meeting the definition of small-scale projects.

M2: BREEAM AP

M2.1: Change of BREEAM AP during the project

The BREEAM AP must keep records of targets, reasons behind decisions, any risks and opportunities identified, and any feedback or advice provided to the project team to fully document their involvement. Whilst it is generally preferable to retain the same individual throughout the project for continuity, this may not always be feasible. The credits may still be awarded where the individual performing the role changes, provided the ongoing involvement of an AP is maintained in accordance with the criteria and all previous records and information are handed over to the new BREEAM AP.

M2.2: Early in the design process

The project team, including the client, agrees on performance targets early enough to enable a smooth process without posing unnecessary barriers to the achievement of criteria at a later stage. This is to ensure the performance targets will have an influence throughout the project, including prior to any required planning approval.

Compliance notes

Ref	Terms	Description
Project planning		
CN1	Building users unknown	Where the building user is unknown, it is still possible to achieve the credit. The building user requirements must be assumed and considered by other project parties (e.g. client, design team, etc.) using their experience and judgement until such time as the occupier is known.
BREEAM AP		
CN2	Assessing and awarding the available credits for a BREEAM AP	There is an additional credit for appointing a BREEAM Advisory Professional (AP) (see Man 03 Responsible construction on page 47). The aim of the credit in Man 03 Responsible construction is to encourage and reward contractors and project teams that appoint a suitably qualified BREEAM AP and therefore ensure continuation of the sustainability objectives during the construction phase, and that the constructed building meets the client's target BREEAM rating.
CN3	Retrospectively applying BREEAM AP status	The BREEAM AP status cannot be applied retrospectively. The purpose of using a BREEAM AP on a project is that they can advise and steer the development from the outset to maximise its BREEAM and sustainability performance for the least cost/risk. If early AP appointment and involvement does not occur, then the aims and criteria of this BREEAM issue are not being met.
CN4	Achieving the design credit on a post-construction stage assessment (PCA)	Where a project will be undertaking a post-construction stage assessment only (with no interim assessment), to demonstrate that the criteria were met at the design stage a "BREEAM credit monitoring report" should be provided when the assessment is submitted, which shows that at the design stage of the project the building was still on target for the proposed BREEAM rating. This could be a spreadsheet showing the issues that the design is on target for achieving, with a short summary of how the

Ref	Terms	Description
		BREEAM AP is steering the project towards the correct rating. As long as the criteria are met and the correct information can be gathered for your evidence, a design stage certification is not required. The performance target must be achieved at post-construction where no design stage certification is available.
CN5	BREEAM-related performance targets	If the BREEAM-related performance targets set at the beginning of the design stage have not been achieved by the interim design stage assessment, the credits for the BREEAM AP within Man 01 must be withheld.
CN6	BREEAM AP and BREEAM Assessor	An individual can be appointed as a BREEAM Assessor and BREEAM AP for the same project, where the Assessor also holds current and applicable BREEAM AP credentials. If this route is chosen, it must be made clear when submitting the assessment that both roles are being carried out by the same person and confirmed how potential conflicts of interest are identified and managed.

Evidence

Criteria	Interim design stage	Final post-construction stage
Project planning		
1–2	Initial Project Delivery Workshop meeting record including Performance Risk Register (Item M)	Final review workshop on how the building has delivered on its design intent and performed against the success criteria and objectives. Any lessons learnt should also be documented.
BREEAM AP		
3–6	The BREEAM AP appointment letter and verification of their AP status. Relevant section or clauses of the building specification or contract or other formal documentation to confirm BREEAM performance target. Project programme or evidence indicating the dates for the key project design stages. Meeting minutes, communication records, formal notes of conversations or other statements reporting on discussions related to performance targets and maximising performance, to demonstrate ongoing involvement and AP attendance at key project meetings. BREEAM AP progress reports (for each applicable work stage: Concept Design, Developed Design and Technical Design).	No further actions required post-construction. Interim design stage certificate showing performance target has been achieved. If undertaking a PCA, please see CN4.

Definitions

BREEAM Advisory Professional (AP)

An individual trained and qualified by BRE as a specialist in built environment sustainability, environmental design and assessment. The role of the BREEAM AP is to provide advice to the project team, facilitate the project team's efforts to successfully schedule activities, set priorities, and negotiate the trade-offs required to achieve a target BREEAM rating when the design is formally assessed. Only qualified individuals who are members of BRE's associated membership scheme comply with the BREEAM requirements. This membership ensures an adequate level of competence is maintained through regular

continuing professional development (CPD) in key relevant areas. For a list and contact details of qualified BREEAM APs, visit: www.greenbooklive.com.

The assessor must ensure that the BREEAM AP qualification was valid at the time of appointment and maintained throughout their involvement in the relevant project stages.

BREEAM AP Design and Site can function as AP during the design phase.

BREEAM AP Operations (US) only cover the in-use phase of BREEAM and are not compliant for this issue.

Concept design

The concept design work stage includes the development of strategies and outline proposals for site planning, built form, structural design, building services systems, outline specifications and preliminary cost information.

Constraints

Some projects may have limitations applied, such as certain size and height restrictions, limited by planning authorities. The project could also be in a conservation area or protected by historic building status. Other factors could be legal covenants, ecology or biodiversity protection laws, or flood risk considerations. Normal national or local construction standards are not considered to be constraints in this context.

Design team meetings

Design team meetings can be defined as those where fundamental decisions that influence or affect the building's proposed design and its construction in accordance with the design (and therefore the building's sustainability impacts and BREEAM performance), are discussed and made. Design team meetings can be conducted via conference calls. These meetings would typically include representatives from at least three of the parties listed below:

1. Representatives of the client or developer
2. The principal contractor
3. The architect
4. Structural engineers
5. Building services engineers
6. Cost consultants
7. BREEAM AP and other sustainability consultants
8. Project management consultants

Developed design

The developed design work stage includes the coordination and updating of proposals for structural design, building services systems, outline specifications, cost information and project strategies.

Formally agreed

The term 'formally agreed' relates to BREEAM performance targets. Examples of formal agreements include:

- Contract documentation or letters of appointment with the architect and other relevant project team members.
- Meeting minutes dated at the appropriate project stage where design team members are present or are on the distribution and the rating has been confirmed as a client requirement.
- Evidence that the BREEAM rating is a planning requirement.
- Confirmation from the client in the form of a letter/email issued at an appropriate project stage to the relevant parties confirming the performance requirements or stating that a document such as pre-assessment report forms part of the contract documentation (where dated early in the design process).

Key phases

The definition of key phases of project delivery includes the following:

- Concept design
- Developed design
- Technical design
- Construction
- Commissioning and handover
- In-use occupation

Performance targets

BREEAM performance targets refer specifically to the BREEAM rating and minimum standards required. This does not necessarily include individual targeted BREEAM issues or credits, which may be traded over the course of the project as it evolves. In agreeing a BREEAM target, it is recommended that individual BREEAM issues, credits and criteria are targeted or prioritised. This is to ensure that the agreed target is achievable and achieved without potentially costly alterations to the design at a later stage. Only the overall BREEAM rating is required to be targeted (e.g. Excellent) and not a specific percentage score.

Project team

The project team includes the client, the building occupier (where known), the design team, and the principal contractor. See also M1.

Small-scale projects

For the purposes of this issue, small-scale projects are defined as projects up to 500 m² gross internal floor area or those having a construction period of 12 weeks or less.

Technical design

The technical design work stage is the stage at which all architectural, structural and building service design information, specialist subcontractor design and specifications are finalised.

Additional information

Soft Landings Framework

Soft landings is a process designed to help the project team focus more on the client's needs throughout the project. It lists activities to be carried out at each stage of the project, from the start of design to occupation. Measures include the inclusion of success criteria along with the setting of operational performance targets at the beginning of a project. These will help the project team monitor if these are being met throughout the project and allow them to evaluate how successful the project has been on completion in meeting the performance objectives. The overall aim is to reduce the performance gap between the building design intent and their actual in-use performance.

Embedding the principles of this framework within a project should ensure that the evidence is available to demonstrate compliance with the Project planning credit.

Guidance can be found in the following documents:

1. BSRIA BG 54/2018 Soft Landings Framework 2018
2. BSRIA BG 74/ 2019 Success Criteria for Soft Landings Projects
3. BSRIA BG 76/2019 Soft Landings and Design for Performance
4. BSRIA BG 81/2022 Soft Landings for Fit-Outs
5. Better Buildings Partnership Soft Landings: The Benefits to Commercial Property Owners, June 2020

Man 02 Life cycle cost and service life planning

(all buildings)

Aim

To promote informed design and specification decisions through life cycle costing and service life planning, optimising whole-life cost, performance, and long-term value of the fit-out.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Two credits – LCC options appraisal for fit out

1 A competent person develops a life cycle cost (LCC) options appraisal for the fit out works (at least two alternatives for each applicable sub-element or component), at an appropriate stage of the design where the outcomes can still influence the final decisions, in line with ISO 15686-5:2017. The period of analysis should be in line with the design life expectancy of the building (or default period of 60 years) and the LCC should include the following element types (where present):

1.a Internal partitions or layout alterations.

1.b Local building services.

1.c Finishes to walls, floors, and ceilings.

1.d Fixtures and fittings included fixed office furniture, kitchens, and bathroom fit-outs.

> The LCC options appraisal should review all of the above element types (where present). However, it is not required to consider all the sub-elements cited under each element; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of alternatives are considered and help focus the analysis on the sub-elements or components which would benefit the most from appraisal.

2 Demonstrate, using appropriate examples provided by the design team (see M1), how the LCC options appraisal has been used to influence building and systems design, and specification to minimise life cycle costs and maximise critical value.

Methodology

M1: Appropriate examples of LCC options appraisals

The options selected to demonstrate how life cycle costs have been minimised and critical value maximised must be appropriate in terms of their relative impact on project costs, future building maintenance burden and/or size (volume or area).

This allows project teams and clients to make informed choices about the long-term financial implications of alternative design decisions.

This must consider:

- initial design and construction costs,
- maintenance and repair expenses,
- energy consumption and operational costs,
- potential future refurbishment costs and
- disposal costs at the end of the building's life.

The LCC option appraisal must consider:

- At least **two** design alternatives (which could be for the base case plus at least one other option) and,
- Include comparison cash flow scenarios for each alternative, in order to determine the most appropriate option.

Examples may include choosing a higher quality material with a longer estimated service life and reduced maintenance requirements, reducing long-term costs of ownership/occupation. Or similarly, selecting alternatives that may cost more initially but are energy efficient and will reduce the energy consumption and operational costs in the long term.

M2: Pre-defined specifications

Where the fit-out is carried out to a pre-defined and set specification, such as a corporate-wide standardised design and specification which limits the alternatives that can be considered (such as where all buildings within a chain are required to be constructed to the same standard and branding), either:

- Complete LCC with options appraisals based on those items which are subject to change. OR
- Where there is no scope to make changes for all or some of the building elements, credits may only be achieved where a compliant LCC plan and options appraisal was carried out for the pre-defined corporate design and specification.

Compliance notes

Ref	Terms	Description
CN1	Historic buildings	Where a relevant conservation authority sets explicit requirements and conservation conditions limiting the kinds of materials and construction product types that can be used, the LCC plans must be based on this limited selection. If only one material or product type is allowed, this is excluded from the study. Relevant conservation authorities can include organisations such as UNESCO, a national / local heritage body, or local government.

Evidence

Criteria	Interim design stage	Final post-construction stage
LCC options appraisal for fit out		
1	Fit out LCC options appraisal.	No further actions required post-construction.

Criteria	Interim design stage	Final post-construction stage
		No additional evidence is required other than that listed for the design stage.
2	Confirmation from the design team as to how the LCC has influenced design/specification and drawings/specifications to support this.	Final construction drawings or equivalent or assessor site inspection report and photographic evidence to show how the outcomes of LCC options appraisal have been implemented within the final design.

Definitions

Competent person

An individual achieving all the following items can be considered to be 'suitably qualified' for the purpose of completing the LCC credits:

1. Holds a recognised qualification for undertaking life cycle costing studies and/or a degree/postgraduate diploma or equivalent qualification in quantity surveying, construction economics or other construction-related subject.
2. Has acquired substantial expertise through a minimum of three years relevant experience (within the last five years). The experience must clearly demonstrate a practical understanding of life cycle costing in construction and the built environment and show an ability to identify and demonstrate cost and performance enhancement measures.
3. Is not professionally connected to a single manufacturer.

A CV or Letter of Competency must be provided demonstrating their experience and knowledge against the above requirements.

Critical value

Critical value aims to *maximise whole life value* of the building based on client requirements and differs from minimising life cycle cost. This is a more specific analysis of how the built asset can impact business needs. For instance:

- Optimising the size and nature of the asset to match the present and future requirements of the business.
- Where any disruption to business is costly, a specification with long periods between maintenance cycles and reduced maintenance time may be desirable.
- Where maintaining aesthetics are important, a maintenance cycle may be based on aesthetic upkeep rather than functional lifespan.
- Where maximum recyclability and re-usability is important, an alternative, costlier specification may be required.
- Where capital costs are constrained, the specification with the lowest LCC may not be affordable, and instead, the best available option within the budget is chosen.

Life cycle cost (LCC)

The cost of an asset or its parts throughout its life cycle, while fulfilling the performance requirements; a methodology for systematic economic evaluation of life cycle costs over a period of analysis, as defined in the agreed scope.

Additional information

When to undertake life cycle costing

Life cycle costing is relevant throughout the building or constructed asset's life cycle including during project planning, design, construction, and in-use phases. For further information please refer to ISO 15686-5:2017.

Methodology for life cycle costing (LCC) for construction

ISO 15686-5:2017 provides the principles and methodology for life cycle costing (LCC) of buildings and constructed assets. The objectives of this standard are to provide:

1. LCC practitioners with a standardised method of applying life cycle costing, applicable to the construction industry and to the key stages of the procurement process.
2. Process mapping the LCC stages – to help structure how to plan, generate, interpret and present the results for a variety of different purposes and levels of LCC planning.

3. Instructions on how to define the client's specific requirements for life cycle costing and the required outputs and forms of reporting – and to decide on which method of economic evaluation to apply.
4. Simplification and demystification – by providing practical guidance, instructions and definitions, together with informative worked examples on how to undertake life cycle costing (for construction).
5. Provide a methodology to facilitate a more accurate, consistent and robust application of LCC estimation and option appraisals, thereby creating a more effective and robust basis for LCC analysis and benchmarking. ISO 15686-5:2017 also seeks to help eliminate confusion over scoping and terminology and to address concerns over the uncertainty and risks that are undermining confidence in life cycle costs used for construction procurement.

Please also refer to:

— **ICMS 3: Global consistency in presenting construction life cycle costs and carbon emissions, 3rd edition, November 2021.**

For the UK, please also refer to:

— **RICS professional guidance note: Life cycle costing, 1st Edition, April 2016.** This includes standards and definitions, essentials of life cycle costing, worked examples and covers both new construction works and refurbishment of existing assets.

— **RICS NRM 3: Order of cost estimating and cost planning for building maintenance works, 2nd Edition, October 2021.** Provides a structured basis for measuring building maintenance works and presents a consistent approach for dealing with other key cost components associated with a building project when preparing order of cost estimates and elemental cost plans.

— **BS 8544: 2013, Guide for life cycle costing of maintenance during the in-use phases of buildings.**

— **BSRIA Guide BG 67/2016.** This presents a practical approach to LCC for the construction and operation of buildings and is compatible with the parts of ISO 15686 that provide recommendations for life cycle costing. This document can be used as guidance illustrating the principles of LCC. It provides examples on identifying alternative solutions, calculating and fine-tuning life cycle costs, as well as interpreting the results of this analysis.

For the USA, please refer to ASTM E917-17e1 Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems

The scope of this document is set out below:

1. This practice establishes a procedure for evaluating the life-cycle cost (LCC) of a building or building system and comparing the LCCs of alternative building designs or systems that satisfy the same functional requirements.
2. The LCC method measures, in present-value or annual-value terms, the sum of all relevant costs associated with owning and operating a building or building system over a specified time period.
3. The basic premise of the LCC method is that to an investor or decision maker all costs arising from an investment decision are potentially important to that decision, including future as well as present costs. Applied to buildings or building systems, the LCC encompasses all relevant costs over a designated study period, including the costs of designing, purchasing/leasing, constructing/installing, operating, maintaining, repairing, replacing, and disposing of a particular building design or system.
4. The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

Man 03 Responsible construction

(all buildings)

Aim

To encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	5	Pass, Excellent, Outstanding	All

Assessment type specific notes

Ref	Assessment type specific note
1.0	**All countries except UK** Projects in all countries except the UK will need to address the prerequisite ('Health and safety legislation', criterion 2) in order to achieve any BREEAM rating.

Building type specific notes

Ref	Building type specific note
2.0	**Small-scale projects** *BREEAM Advisory Professional – Site*: For small-scale projects, a BREEAM Assessor can act as the BREEAM Advisory Professional (AP), without being a registered BREEAM AP. In this case, potential and actual conflicts of interest must be identified by the assessor and acknowledged in a written statement submitted alongside the assessment.
2.1	**UK Healthcare projects** For NHS healthcare assessments, please see criterion 3.

Assessment criteria

Prerequisite – Legally harvested and traded site timber

1 All temporary site timber and timber-based products (excluding timber verified as being reused, recycled, or reclaimed) used during the construction process of the project must be 'Legally harvested and traded timber'.

Prerequisite – Health and safety legislation (all countries except UK)

2 All national health and safety legislation and regulations for construction sites are considered and implemented during all phases of the project (see CN1 on page 51):

- 2.a The design of the asset: to minimise health and safety risks.
- 2.b Pre-construction work planning and organisation: to collate health and safety information from all relevant stakeholders.
- 2.c Site set-up: to implement health and safety features.

2.d Construction: to manage, monitor and report on the health and safety of construction site staff. This should be summarised in a report.

Prerequisite – For UK Healthcare NHS buildings only

3 To award any of the credits available for this issue, any party who at any stage manages the construction site (e.g. the principal contractor, the demolition contractor) must operate an Environmental Management System (EMS) (see requirements of criterion 4).

One credit – Environmental management

4 All parties who manage the construction site at any stage must operate an environmental management system (EMS) covering their main operations. The EMS must be third-party certified to ISO 14001, EMAS (EU Eco-Management and Audit Scheme), or an equivalent standard.

5 All parties who manage the construction site at any stage (for example, the principal contractor or demolition contractor) must implement best practice pollution prevention policies and procedures on site. To demonstrate compliance the project team should complete the checklist given in Table 12 on page 50 showing how the intent of every section (e.g. air quality) has been met, even if by different means than the actions suggested.

One credit – BREEAM Advisory Professional – Site

6 The client must formally agree with the contractor the performance targets relating to the BREEAM certification that have been set for the project.

7 A BREEAM AP must be involved in the project at an appropriate time and level to ensure that the agreed performance targets are met. Specifically, the AP will:

7.a Work with the project team, including the client, to help them maximize performance against the agreed targets throughout construction, handover and closeout. This support will include providing advice as needed and considering links between the criteria that need to be met across all project areas to be assessed by BREEAM (e.g., Management, Energy, Ecology etc), going beyond the design intent wherever possible.

7.b Monitor progress against the agreed performance targets throughout all stages of the construction, paying particular attention wherever decisions are made that could critically impact the BREEAM performance, and keeping all records needed as evidence for the assessment.

7.c Proactively identify risks and opportunities related to the procurement and construction processes and the achievement of the targets agreed under criterion 6.

7.d Feedback promptly and regularly to the contractor and project team helping the project stay on track to meet its targets and supporting any necessary corrective actions.

7.e Where appropriate, coordinate the project team to provide the assessor with the necessary evidence to achieve the credits.

8 To achieve this credit at the final post-construction stage of assessment, the submitted assessor's report must show that a BREEAM AP was appointed at an appropriate time and that the agreed performance targets have been demonstrably achieved by the project.

Up to two credits – Responsible construction management

9 Credits are awarded as follows, based on the number of items within the checklist that have been achieved:

9.a All items checked as 'required for one credit' in Table 11 must be achieved for one credit to be awarded.

9.b Projects achieving all items in Table 11 may be awarded a second credit.

Table 11: Checklist of the required criteria to achieve credits for responsible construction management

Ref.	Criteria	Required for one credit
Risk evaluation and implementation		

Ref.	Criteria	Required for one credit
The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks, covering the following, as appropriate:		
a	Manage the construction site entrance to minimise the impacts (e.g. safety, disruption) arising from vehicles approaching and leaving the development footprint and whilst deliveries are unloading.	
b	Implement practices to ensure the development footprint is safe, clean and organised at all times. This includes, but is not limited to, facilities, materials and waste storage.	✓
c	Ensure clear and safe access in and around the buildings at the point of handover.	
d	Implement measures to ensure disruption from any dust or noise to neighbouring properties or tenants is minimised.	✓
e	Provide processes and equipment required to respond to medical emergencies.	✓
f	Identify and implement initiatives to promote and maintain the health and wellbeing of all site operatives within the development footprint. This can involve site facilities, site management arrangements, staff policies etc.	✓
g	Establish management practices and facilities encouraging equality, fair treatment and respect of all site operatives and visitors.	✓
h	Provide secure, clean and organised facilities (e.g. welfare, changing and storage facilities) for site operatives within the development footprint.	✓
i	Minimise nuisance and intrusion on the lives of the local community, by engaging with the community and neighbourhood to ensure that any unavoidable impacts of construction are communicated regularly and sensitively.	✓
j	Ensure that ongoing and up-to-date training and inductions are provided for personnel and visitors.	
k	Ensure all site operatives are trained for the tasks they are undertaking (including any site-specific considerations) and provided with the necessary PPE.	

One credit – Site monitoring of utility consumption

10 Assign responsibility for site monitoring to a named individual. This is a prerequisite for the award of any of the site monitoring credits set out below. The responsible individual must have the appropriate authority and experience to access the data required. They may be the BREEAM AP, where one has been appointed. They will be required to monitor, record and report on energy use and water consumption resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. Report the project value. This is a prerequisite to achieving criteria 11 to 16.

Energy consumption

11 Set targets at design stage for the site energy consumption in kWh (and where relevant, litres of fuel used) resulting from the use of construction plant, equipment (mobile and fixed), and site accommodation.

12 Monitor and record data for the energy consumption described in criterion 11 and show that the consumption targets have been achieved.

13 Report the total carbon dioxide emissions (total $kgCO_2e$) and energy consumption (electricity in kWh and litres of fuel) resulting from the construction process.

Water consumption

14 Set targets at design stage for the potable water consumption (m^3) arising from the use of construction plant, equipment (mobile and fixed), and site accommodation.

15 Monitor and record data for the potable water consumption described in criterion 14 and show that the consumption targets have been achieved.

16 Use the collated data to report the total net water consumption resulting from the construction process (m^3), i.e. consumption minus any recycled water use.

Checklists and tables

The project team will need to complete this checklist as part of the credit for 'Environmental management' (see criterion 5). The assessor and project team must ensure that the intent of each section is met through measures appropriate to the site, which may be different to the examples given here. Areas outside the site boundary with special permission for enabling works should be included.

Table 12: Checklist of measures to minimise air and water pollution during construction works

Section and intent	Examples of actions
1. Pollution prevention planning To allow time to plan and prepare before work begins on site. This can significantly reduce the risk of a pollution incident.	Possible activities to consider before works begin on site: — Review the site and site plans for possible sources of pollution, pollution pathways and vulnerable areas. — Review any environmental information about the site such as ecology reports or site investigation reports and highlight potential issues. This could include site working restrictions relating to noise or deliveries. — Identify: — Potential pollutants — The potential to cause pollution on site. — All interested groups i.e. regulators and neighbours. — Surface waters and ground waters adjacent to the site. — Drainage on site. — Confirm any legislation that applies to the project. — Plan appropriate control measures that are required. — Designate a responsible person to monitor high risk activities and with sufficient authority to prevent them.
2. Noise and vibration Minimise the impact of noise and vibration in the local community.	Measures may include where applicable: — Planning the noisiest activities for times that will result in the least disturbance to the local community. — Putting together a traffic management plan. — Use of barriers or deflectors for impact and blasting activities. — Using plant or machinery with noise controls measures – silencers, mufflers, acoustic covers. — Avoiding or minimising construction transport through community areas, use of one-way traffic to minimise reversing, agreed delivery times.
3. Air quality To prevent dust and other air pollution on site and in the local community.	This may include where applicable: — Minimising dust from materials or waste ensuring these are adequately protected, covered, or damped down. — Reducing dust from vehicle movements through damping down roads, wheel washers, and road sweeping. — Avoiding burning of materials on site. — Ensuring plant and vehicles are regularly maintained and meet necessary exhaust emission standards.
4. Watercourse pollution To prevent water pollution from on-site activities.	This may include where applicable: — Marking up a plan identifying all watercourses and existing drains on site, any existing protection in place or protection measures required to capture, contain, and treat possible contaminants or run-off. — Controls to prevent silt entering watercourses and drains including features such as cut-off trenches or vegetation corridors. — Ensuring fuel, chemical and waste storage areas and activities such as cement mixing or washing out are located away from rivers, boreholes, gullies or other water courses. — Storing all chemicals and hazardous substances in a contained, bunded areas on an impermeable surface and ensuring all containers are free from damage and disposed of correctly. — Training staff on the correct transfer and handling of fuels and chemicals, and emergency procedures. — Providing portable spill containment and clean-up equipment on site and

Section and intent	Examples of actions
	training staff to use it. — Where there is a risk to water quality, carrying out an assessment on the impact on water and developing a water use and protection management plan.

Methodology

M1: Scope of Man 03 Responsible construction

This issue encompasses the responsible management of all activities on site, and relating to the site, from the beginning of any soft strip out or enabling works to the completion of construction. All criteria detailed in this issue, and the aim of the issue overall, are considered the responsibility of any party who at any stage manages the construction site, especially when this is not consistent throughout a project.

The exception to this is if the developer or client has taken ownership of a site following completion of any soft strip or other enabling works. In this case, these works can be excluded from assessment of this issue.

M2: The role of the BREEAM AP

M2.1: Change of BREEAM AP during the project

The BREEAM AP must keep records of targets, reasons behind decisions, any risks and opportunities identified, and any feedback or advice provided to the project team to fully document their involvement. If the person carrying out this role changes during the project, credits may still be awarded provided there has been a robust handover of records and information to a new BREEAM AP and the role is seamlessly maintained in accordance with the criteria.

M2.2: BREEAM AP monitoring construction progress

To monitor the construction progress against the agreed performance targets (see criterion 7.b), the BREEAM AP should ideally be site based. If based elsewhere, they must visit the site sufficiently regularly to monitor activities, carry out spot checks, identify risks of non-compliance and advise on how to address any such shortcomings.

The BREEAM AP must as a minimum visit the site at key stages of the construction process, such as at times when:

— Works can be observed before they are covered up or new works or trades start.

— There are significant risks of conflicts or errors occurring.

— Timing is critical for demonstrating compliance.

— Key evidence is required to be produced at specific times. This includes, but is not limited to, photographic evidence, delivery notes and other documentary evidence.

— Different trades and systems working simultaneously risk harming one another's integrity or compliance in terms of BREEAM requirements.

M3: Responsible construction management – UK and Ireland projects

When demonstrating compliance with the responsible construction management criteria it may be possible to use BREEAM-recognised responsible construction management schemes to support in this process. See Guidance Note 54 (GN54) and definitions for further information.

Compliance notes

Ref	Terms	Description
Prerequisite – Health and safety legislation		
CN1	National health and safety regulations and best practice. See criterion 2.	Where there are no national health and safety regulations in the country of assessment, evidence is required to demonstrate that EITHER: — The principal contractor has an occupational health and safety management system compliant with ISO 45001 OR

Ref	Terms	Description
		— Works will be carried out in accordance with the International Labour Organisation's (ILO) Safety and Health in Construction Code of Practice.
Environmental management		
CN2	No principal contractor. See criteria 4 and 5.	To achieve compliance where there is no principal contractor, the criteria must be met by the party which fulfils an equivalent role in managing the construction. The intent of this issue is to ensure that the site is managed in accordance with demonstrably sustainable principles by whichever the party has overall control of site management and operations.
CN3	Certificate validity. See criterion 4.	The requirement for the principal contractor to operate an EMS relates to the duration of operations on site. Certification against ISO 14001 or EMAS must be valid at the design stage and post-construction stage submissions and cannot be expired, pending or applied retrospectively.
CN4	Timing of obtaining EMS certification. See criterion 4.	The contractor must be in possession of the ISO 14001 or EMAS certification prior to starting works on the development under assessment. This is to ensure that the aim of the issue, to 'encourage construction sites managed in an environmentally sound manner', can be achieved. To uphold the robustness of BREEAM, the date of certification to ISO 14001 or EMAS must be prior to initial works starting on the site.
BREEAM AP		
CN5	Retrospectively applying AP status. See criterion 7.	The AP status cannot be applied retrospectively. The purpose of using an AP on a project is so that they can influence and maximise the development the BREEAM and sustainability performance of the project for the least cost/risk. If the AP is not appointed and involved from at least the beginning of work on site, and preferably in the planning of such work, then the aims and criteria of this BREEAM issue are not being met.
CN6	BREEAM Assessor as the BREEAM AP. See criterion 7.	Where an assessor holds current and applicable AP credentials, the same individual can be appointed as both BREEAM Assessor and BREEAM AP for the project. In such cases, it must be made clear when submitting the assessment that both roles are, or were, being carried out by the same person and explained in writing how potential conflicts of interest have been identified and managed.
Responsible construction management		
CN7	Compliance with responsible construction management items.	In instances where items in Table 11 are not relevant due to the project scope of works on site, the assessor should clearly justify and robustly demonstrate the project is compliant without these items having been achieved.
General		
CN8	Change in principal contractor	If the principal contractor changes mid-project, for example where the original contractor goes into administration and is replaced, it is acceptable for the post-construction credits to be based on the activities of the new contractor providing these are monitored and recorded from before work on site commences. However, if the project has already started on site and information about the site activities of the previous contractor is not available the relevant credits must be withheld. In such instances, where appropriate justification is provided, the prerequisites or minimum standards may be waived. For example, the prerequisite 'Legally harvested and traded timber' is achievable with incomplete evidence provided that the client demonstrates appropriate efforts to obtain the required evidence, together with the following: — Evidence of the company going into administration. — All evidence of compliance that was provided from the company in administration, where available. — Evidence of compliance from the date a new company was engaged.
CN9	Multiple contractors on the same project	The aim of this issue is that the construction site complies with BREEAM criteria rather than any specific contractor. Several different contractors may have obligations to

Ref	Terms	Description
		meet compliance criteria. One of the contractors and/or site managers may have responsibility for ensuring compliance during site operations. It is ultimately the client/project team's responsibility to determine and demonstrate compliance.

Evidence

Criteria	Interim design stage	Final post-construction stage
Prerequisite – Legally harvested and traded site timber		
1	Relevant section or clauses of the building specification or contract. OR A signed and dated letter of commitment to meet the relevant criteria.	Confirmation of all temporary site timber used and for what purpose. Where certified materials were used, copies of all relevant certificates or chain of custody evidence. Robust post-construction evidence to verify proof of purchase such as delivery tickets, invoices, purchase orders, confirmation from suppliers or site photographs.
Prerequisite – Health and safety legislation		
2	Relevant section or clauses of the building specification or contract. OR A signed and dated letter of commitment to meet the relevant criteria.	Confirmation of the national H&S legislation and regulations that have been followed. AND Supporting documentation such as designer risk assessments, construction environmental management plans, site procedures and site plans, site records, on-site health and safety monitoring.
Environmental management		
4	Relevant section or clauses of the building specification or contract. OR A signed and dated letter of commitment to meet the relevant criteria. OR A copy of the principal contractor's EMS/EMAS certificate, where contractor is appointed.	A copy of the principal contractor's EMS/EMAS certificate.
5	Relevant section or clauses of the building specification or contract. OR A signed and dated letter of commitment to meet the relevant criteria. OR A copy of the checklist (Table 12 on page 50) and supporting evidence confirming the proposed measures and procedures against each section.	A copy of the checklist (Table 12 on page 50) confirming how each section has been addressed by the referenced evidence. Evidence to support that procedures and policies for pollution prevention management were in place and implemented such as construction environmental management plans, site procedures, site plans, site records and site photographs.
BREEAM AP		
6, 8	Relevant section or clauses of the building specification, contract documents or formal agreement stating the required BREEAM performance rating.	No further actions required post-construction other than the Assessor's report to demonstrate that the performance rating has been achieved.
7	Relevant section or clauses of the building specification or contract. OR	Evidence to confirm the appointment of the BREEAM AP, when it took place, and confirming their AP status.

Criteria	Interim design stage	Final post-construction stage
	A signed and dated letter of commitment to meet the relevant criteria.	Supporting evidence such as reports, correspondence and meeting minutes to verify their ongoing involvement in the project and attendance on site and at relevant project team meetings.
Responsible construction management		
9	Relevant section or clauses of the building specification or contract. OR A signed and dated letter of commitment to meet the relevant criteria. Note: It must be clear which responsible construction management items within Table 11 are being targeted.	Supporting evidence such as site plans, procedures or policies, site inspection reports or photographs, site records or letters. Where applicable, evidence to support registration prior to commencement on site, CCS certificate, and monitor's final report. Note: it must be confirmed how each point in Table 11 has been evidenced (except where met by CCS certification).
Site monitoring		
10 to 16	Confirmation of the targets that have been set for the project. Details of the predicted project value. AND Relevant section or clauses of the building specification or contract. OR A signed and dated letter of commitment to meet the relevant criteria.	Name of the individual appointed for monitoring, recording and reporting site data. Confirmation of the final project value. Monitoring records showing collated construction phase data including: — Total site energy consumption. — Total site net water consumption. — Evidence to validate figures provided such as photos of meter readings or invoices.

Definitions

BREEAM Advisory Professional (AP)

An individual trained and qualified by BRE as a specialist in built environment sustainability, environmental design and assessment. The role of the BREEAM AP is to provide advice as needed and facilitate the project team's efforts to successfully schedule activities, set priorities and negotiate the trade-offs required to achieve a target BREEAM rating when the design is formally assessed. Only qualified individuals who are members of BRE's associated membership scheme comply with the BREEAM requirements. This membership ensures an adequate level of competence is maintained through regular continuing professional development (CPD) in key relevant areas. For a list and contact details of BREEAM APs, visit: www.greenbooklive.com.

The assessor must ensure that the BREEAM AP qualification was valid at the time of appointment and maintained throughout their involvement in the relevant project stages.

The AP does not need to be the same person as appointed under Man 01.

BREEAM AP Operations (US) only cover the in-use phase of BREEAM and are not compliant for this issue.

BREEAM-recognised responsible construction management schemes

These are third-party schemes evaluated by BRE Global for recognition under BREEAM. For further guidance on recognised schemes and the way in which they support compliance with these BREEAM criteria, see Guidance Note 54 (GN54).

This is a list of existing schemes that we are currently aware of that may support the achievement of the responsible construction management criteria:

— **Considerate Constructors Scheme:** The Considerate Constructors Scheme (CCS) is a national initiative set up by the UK construction industry to improve its image. The scheme is a self-financing, independent organisation owned by the Construction Umbrella Bodies (Holdings) Ltd (made up of the Construction Products Association and the Construction Industry Council). Sites and companies that register with the scheme sign up and are monitored against a Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

Construction process

The construction process includes the enabling works, assembly, installation and disassembly activities necessary for servicing the construction and completion of a new building.

Dedicated off-site manufacturing or fabrication

Production of a component or material carried out in an off-site manufacturing or processing facility specifically set up for a development project. This excludes manufacturing from 'off the shelf' products.

Development footprint

The development footprint includes any land used for buildings, hardstanding, landscaping, site access or where construction work is carried out (or land is being disturbed in any other way), plus a 3 m boundary in every direction around these areas. It also includes any areas used for temporary site storage and buildings. If it is not known exactly where buildings, hardstanding, site access, temporary storage and buildings will be located, it must be assumed that the development footprint is the entire development site.

Exhaust emission standards

This may include demonstrating that the following standards are being met. Where there are local authority or national guidelines in place, these may be used instead.

— Non-Road Mobile Machinery (NRMM) Regulation (EU) 2016/1628.

— For road going vehicles: Euro emission standards (Euro 1 to 7).

Formally agreed

The term 'formally agreed' relates to BREEAM performance targets. Examples of formal agreements include:

— Contract documentation or letters of appointment between the Client and Contractor.
— Meeting minutes dated at the appropriate project stage, where the Contractor is present and the rating has been confirmed as a client requirement.
— Evidence that the BREEAM rating is a planning requirement.

Performance targets

BREEAM performance targets refer specifically to the BREEAM rating and minimum standards required. This does not necessarily include individual targeted BREEAM issues or credits, which may be traded over the course of the project as it evolves. In agreeing a BREEAM target, it is recommended that individual BREEAM issues, credits and criteria are targeted or prioritised. This is to ensure that the agreed target is achievable and achieved without potentially costly alterations to the design at a later stage. Only the overall BREEAM rating is required to be targeted (e.g. Excellent) and not a specific percentage score.

Principal contractor

The company that has overall responsibility for overseeing the construction stage of the project, whether that is a contractor or managing agent.

Project value

The term 'project value' represents the total project cost, which includes all costs such as construction, design, land acquisition, etc.

Relevant stakeholders

These can include design team, main contractor, sub-contractors, specialist contractors, and manufacturers.

Small-scale projects

For the purposes of this issue, small-scale projects are defined as projects up to 500 m² gross internal floor area or those with a construction period of 12 weeks or less.

Small-scale projects may follow full requirements where preferred.

Timber – including legally harvested and traded; recycled / reclaimed

Legally harvested and traded timber

For all countries except UK:

Legally harvested timber and wood-derived products are those that originate from a forest where the following criteria are met:

1. The forest owner or manager holds legal use rights to the forest
2. There is compliance by both the forest management organisation and any contractors with local and national legal criteria including those relevant to:
    a. Forest management.
    b. Environment.
    c. Labour and welfare.
    d. Health and safety.
    e. Other parties' tenure and use rights.
    f. All relevant royalties and taxes are paid.
3. There is full compliance with the criteria of CITES.

Legally traded means timber or products derived from Legally harvested timber were:

1. Exported in compliance with exporting country laws governing the export of timber and timber products, including payment of any export taxes, duties or levies.
2. Imported in compliance with importing country laws governing the import of timber and timber products, including payment of any import taxes, duties or levies.
3. Traded in compliance with legislation related to the convention on international trade in endangered species (CITES), where applicable.

For UK projects:

BREEAM follows the UK government's definition of legal and sustainable timber, as outlined in the Central Point of Timber (CPET) 5th Edition of the UK Government Timber Procurement Policy (TPP). At the time of writing, the policy requires all timber and wood-based products to be covered by at least one of the following (but the webpage below should be checked for changes):

1. Third party, independent forest certification schemes – Category A (e.g. FSC or PEFC).
2. Evidence on a case-by-case basis in line with the Framework for Evaluating Category B evidence – Category B.

For the avoidance of doubt, 100% of the timber and timber-based products must be compliant.

Further information on the UK Government's TPP and compliant responsible sourcing certification schemes is available from: www.gov.uk/guidance/timber-procurement-policy-tpp-prove-legality-and-sustainablity.

For projects in USA and Canada:

Compliance with the prerequisite can be demonstrated using the ASTM D7612-21 standard.

Examples of legally harvested and traded timber

The following examples are considered compliant for the purpose of BREEAM:

Evidence type	Demonstrates timber is legally harvested	Demonstrates timber is legally traded
Compliance with CPET (timber bought inside the UK only).	Yes	Yes
FSC, PEFC or SFI certification (this includes products labelled FSC Mix or	Yes	Yes

Evidence type	Demonstrates timber is legally harvested	Demonstrates timber is legally traded
PEFC mixed sources).		
Evidence of compliance with the EUTR (timber bought inside the EU only).	Yes	No
Risk assessment/due diligence documentation demonstrating a low risk of non-compliance with the 'legally harvested' requirements.	Yes	No
Risk assessment/due diligence documentation demonstrating a low risk of non-compliance with the 'legally traded' requirements.	No	Yes

Products labelled as FSC Controlled Wood only minimise the risk that wood comes from illegal or controversial sources and does not eliminate the risk fully. Therefore, products labelled as such do not meet the prerequisite for legally harvested and traded timber.

Timber that is being reused and can be verified as such, for example old timber formwork, can be excluded from the requirements. The criteria only applies to new formwork or scaffolding boards or any other new temporary site timber products purchased for the project, not that which is being reused.

Recycled / reclaimed timber

This is recovered wood that prior to being supplied to the project had an end use as a standalone object or part of a structure that has completed its lifecycle, and which would otherwise be disposed of as waste. The term covers the following categories:

- Pre-consumer recycled wood and wood fibre or industrial by products but excluding sawmill co-products (sawmill co-products are deemed to fall within the category of virgin timber).
- Post-consumer recycled wood and wood fibre.
- Driftwood.

The term "recycled" also covers reclaimed timber that was abandoned or confiscated at least ten years previously.

Training

For the purposes of this issue, appropriate training can mean teaching, or developing for oneself or others, areas of skill and knowledge relating to relevant competencies (e.g. manual handling, safe working practices, regulations, project management, vocational skills, site supervision).

Training includes, but is not limited to:

1. Formal external training.
2. On site learning from trained or experienced people.
3. Provision of training material or instructions for carrying out tasks.

Additional information

Health and safety legislation

For U.S. - Occupational Safety and Health Administration (www.osha.gov/construction/)

OSHA's mission is to assure America's workers have safe and healthful working conditions free from unlawful retaliation. OSHA carries out its mission by setting and enforcing standards; enforcing anti-retaliation provisions of the OSH Act and other federal whistleblower laws; providing and supporting training, outreach, education, and assistance; and ensuring state OSHA programs are at least as effective as federal OSHA, furthering a national system of worker safety and health protections.

Where states have their own OSHA approved State Plans or Hybrid Federal-State Plans which include more stringent safety requirements, these must also be met.

Examples of evidence for BREEAM AP criteria

Examples of evidence that could be used to demonstrate compliance with some of the requirements of the BREEAM AP related criteria include, but are not limited to the following:

- Meetings minutes, communication records, formal notes of conversations and other statements reporting on discussions related to performance targets and maximising performance.
- Risks and opportunities documentation.

Examples of evidence for responsible construction

Examples of evidence that satisfy criteria 9 include, but are not limited to the following:

- Company's policy and procedure documents (including environmental management, pollution prevention, security).
- Construction logistics plan.
- Responsibility matrix.
- Training records.
- Photographic evidence.
- Records of communication with the neighbouring community. For example: letters, newsletters and campaigns.
- Contracts or formal agreements – Reporting documents and logs.
- Reporting procedures.
- Records of improvements and of no complaints.
- Lessons learned.
- Evidence produced by third-party schemes. For example: Considerate Constructors Scheme (CCS) monitor's report, Fleet Operators Recognition Scheme (FORS), Construction Logistics and Community Safety (CLOCS), BRE Yellow Jacket documentation.

CO_2 reporting protocols

At the time of publication, the following guidance is available for CO_2 measuring protocols.

1. Encord (www.encord.org)
2. GHG Protocol (www.ghgprotocol.org)
3. For UK: Defra guidance for business (www.gov.uk/guidance/measuring-and-reporting-environmental-impacts-guidance-for-businesses)

Conversion factors in national regulations may be used where available.

Tools for monitoring and targeting construction site impacts

SmartWaste is an online environmental reporting tool for the construction industry. It enables organisations to efficiently capture, monitor and report on:

- Waste (including Site Waste Management Plans & Pre-Demolition Audits).
- Energy (including conversion to carbon dioxide emissions).
- Water.
- Responsibly sourced materials (including timber).
- Transport.
- Considerate Contractors Scheme.

Used to meet the criteria of this issue and as a source of evidence for demonstrating compliance, SmartWaste helps organisations to reduce their environmental impacts, making substantial time and cost savings.

More information about SmartWaste can be found at: www.smartwaste.co.uk.

The International Finance Corporation provides information relating to this issue - see the IFC World Bank Group Environmental, Health and Safety (EHS) Guidelines.

The value of the BREEAM AP

The BREEAM AP can be called on and provide BREEAM and general sustainability design and construction expertise and advice to design teams, specifiers, constructors and other key stakeholders. This will inform decision-making and therefore identify opportunities to maximise performance and work towards a targeted rating in the most cost-effective, timely and solutions orientated way.

The BREEAM AP will coordinate and work with the BREEAM Assessor to ensure an efficient and smooth assessment process, aiming to maximise the performance of the assessed project.

Tools and schemes for responsible construction management

Other tools and schemes can contribute to achieving the credits for responsible construction management, including the Considerate Constructors Scheme and Fleet Operator Recognition Scheme. For more information, see Guidance Note 54 (GN54).

Man 04 Commissioning and handover

(all buildings)

Aim

To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	3	Very Good	All (see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Scope of works – Local services and equipment** Where the fit-out includes the installation of local building services and equipment, the commissioning and handover credits will apply. This could include lighting, small power, HVAC zoning, BMS systems, security or fire alarm installations or client equipment such as display chillers or freezers. Where there are none within the scope of works, this issue will be filtered out.

Building type specific notes

Ref	Building type specific note
2.0	**Small-scale projects** For small-scale projects, only the requirements for 'Schedule and responsibilities (criteria 1 to 5) and 'Handover' (criteria 8 and 9) are applicable.

Assessment criteria

One credit – Schedule and responsibilities

1 Prepare a schedule of commissioning and testing. The schedule identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems.

2 The schedule must identify the appropriate standards that all commissioning activities will be conducted in accordance with (see M1).

Any industrial process or manufacturing-related equipment specified as part of the project can be excluded from the assessment, except where it forms an integral part of building services, such as some heat recovery systems or cold storage systems as defined in Ene 06.

3 Where a building management system (BMS) is specified:

3.a Carry out commissioning of air and water systems when all control devices are installed, wired, and functional.

3.b Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in commissioning results.

3.c The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover.

3.d All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover.

3.e Fully train the occupier or facilities team in the operation of the system.

4 Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include re-commissioning activities on behalf of the client.

5 The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. The programme shall allow for the required time to complete all commissioning and testing activities prior to handover.

One credit – Commissioning role

6 Achieve the schedule and responsibilities credit (criteria 1 to 5).

7 During the initial design stages (prior to commencement of any technical design), the client or principal contractor appoint a specialist commissioning manager who will be responsible for:

7.a Holding a commissioning workshop to:

7.a.i Establish the commissioning requirements and related success criteria.

7.a.ii Determine the commissioning scope such as what building systems need to be commissioned, any interfaces required, what commissioning activities will need to take place at each project stage and what is the standard of commissioning required.

7.a.iii Agree on the commissioning budget required for each phase of the project.

7.a.iv Review commissioning lessons learned from previous projects.

7.b Developing a design stage Commissioning Plan. This initial plan and schedule will be developed further through the later projects stages and finalised through the construction phase. The plan must define:

7.b.i The commissioning process, identifying the project-specific commissioning tasks to be executed at the different stages of delivery.

7.b.ii Commissioning roles and responsibilities. Including any specialist sub-contractors.

7.b.iii The commissioning schedule, sequencing the commissioning events and associated dates and durations.

7.c Undertaking commissionability reviews to provide advice that helps streamline the commissioning process and identify any potential issues particularly in relation to interfaces between systems.

7.d Production of the Commissioning Specification – *This document will generally be produced by the project's consulting engineers with input from the commissioning manager and will set out the technical system performance requirements and test procedures.*

7.e Ensuring the production of Commissioning Methodologies during the construction stage – *These will typically be developed by the specialist sub-contractors for each system and checked by the commissioning manager. The commissioning manager will need to produce the integrated systems test (ISTs) methodologies (where applicable).*

7.f Managing the commissioning process throughout the project and the performance testing at handover or post-handover stages.

For buildings, which do not have complex building services or systems, this role can be carried out by a non-specialist commissioning manager.

One credit – Handover

8 Prior to handover, develop two building user guides (see M2) for the following users:

8.a A non-technical user guide for distribution to the building occupiers.

8.b A technical user guide for the premises facilities managers.

A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users.

9 Prepare two training schedules (see M3) timed appropriately around handover and proposed occupation plans for the following users:

9.a A non-technical training schedule for the building occupiers.

9.b A technical training schedule for the premises facilities managers.

Methodology

M1: Commissioning standards

M1.1: Projects in all countries except UK

Please refer to the Approved Standards List to locate the appropriate national building regulations and best practice commissioning codes in the county of assessment. Alternatively, please demonstrate that the minimum requirements as set out in the Approved Standards List are covered by the proposed documents. Clear referencing must be used to show how the Approved Standards List has been used to confirm compliance.

Where appropriate commissioning codes do not exist for a country, the design team should demonstrate compliance with the UK or European standards as listed in each relevant country reference sheet.

M1.2: UK projects

The appropriate standards for all commissioning activities will include, where applicable:

1. Current Building Regulations
2. BSRIA guidelines
3. CIBSE guidelines
    - Commissioning Code A: Air distribution systems. CIBSE; 2024.
    - Commissioning Code B: Boilers. CIBSE; 2002.
    - Commissioning Code C: Automatic Controls. CIBSE; 2001.
    - Commissioning Code L: Lighting. CIBSE; 2018.
    - Commissioning Code M: Commissioning Management. CIBSE; 2022.
    - Commissioning Code R: Refrigerating Systems. CIBSE; 2002.
    - Commissioning Code W: Water Distribution Systems. CIBSE; 2025.

M2: Building user guides

The building user guides shall be building-specific or site-specific guidance. The purpose of the guides is to help building users access, understand and operate the building efficiently and in accordance with the original design intent. The content of the guides is specific to the building type and end users and the extent will depend on the scope of works, but broadly must include information on the following (where relevant):

1. Overview of the building and its environmental strategy, e.g. energy or water efficiency policy or strategy, and how users should engage with and deliver the policy or strategy.
2. Waste and recycling strategy, including location of facilities.
3. Provision of, and access to, shared facilities.
4. Safety and emergency information or instructions.
5. Building-related operational procedures specific to building type or operation, e.g. laboratories.
6. Building-related incident reporting and feedback arrangements.
7. Provision of and access to transportation facilities, e.g. public transport, cyclist facilities, pedestrian routes etc.
8. Provision of and access to local amenities.
9. Links, references and relevant contact details.

Additionally, for the non-technical building user guide for building occupiers:

1. Building services overview and how to access building occupant controls, e.g. where to find them, what they control, how to operate them effectively and efficiently etc. The guide should avoid jargon and contain simple and clear, easy-to-follow instructions on all controls relevant to the general building user such as local heating, lighting, or blinds.
2. Pre-arrival information for visitors, e.g. access and security procedures or provisions.

Additionally, for the technical building user guide for facilities managers:

1. Building services overview and access to facilities management controls, e.g. where to find them, what they control, how to operate effectively and efficiently etc.
2. Details on energy and water metering and monitoring strategies, including targets.
3. Refit, refurbishment and maintenance arrangements or considerations.
4. Building related training information or links.

The building user guide for building occupiers must be written clearly and provide easily accessible and understandable information relevant to the building's staff (or where relevant residents) and to other building users, e.g. visitors or community users.

The building user guide for facilities managers can use more technical language if appropriate and provide understandable information relevant to the professionals managing the building facilities. This guide could be part of the operations and maintenance (O&M) manual.

There is no requirement on the format the building user guide should take.

Where items are already covered under an existing whole building user guide, these can be omitted from the requirements.

M3: Training schedule

The training schedules only need to cover those services installed as part of the scope of works and shall include the following as a minimum:

— The building's design intent.

Additionally, for the building occupiers' training schedule:

— Introduction to the non-technical building user guide for building occupiers and other relevant building documentation.

Additionally, for the facilities managers' training schedule:

— The available aftercare provision and aftercare team main contacts, including any scheduled commissioning and post occupancy evaluation.

— Introduction to, and demonstration of, installed systems and key features, particularly building management systems, controls and their interfaces.

— Introduction to the technical building user guide for facilities managers' and other relevant building documentation, e.g. design data, technical guides, maintenance strategy, operations and maintenance (O&M) manual, commissioning records, logbook etc.

— Maintenance requirements, including any maintenance contracts and regimes in place.

Compliance notes

Ref	Terms	Description
Schedule and responsibilities, commissioning role		
CN1	Monitor and specialist commissioning manager	The commissioning monitor is typically a project team member who will monitor the systems commissioning and testing programme for the building. The individual may combine that role with that of the specialist commissioning manager to deal with complex systems if they have the necessary knowledge. For the 'Commissioning role' credit, whilst a single commissioning manager will be appointed to lead the process, there will likely be involvement and input from

Ref	Terms	Description
		manufacturers or specialist subcontractors, who will form part of a commissioning team.

Evidence

Criteria	Interim design stage	Final post-construction stage
Schedule and responsibilities		
1–4	Relevant section or clauses of the building specification or contract. OR A letter of commitment from the client or developer. AND Commissioning schedule (where available).	Commissioning schedule identifying commissioning standards followed and evidence to verify that commissioning was carried out in line with these. BMS commissioning records or procedures. Confirmation of appointment of appropriate project team member.
5	Copy of the principal contractor's programme and project budget showing commissioning allowances. OR Where contractor not yet appointed: Relevant section or clauses of the building specification or contract. OR A letter of commitment from the client or developer.	Copy of the principal contractor's programme and project budget showing commissioning allowances.
Commissioning role		
7	Letter of appointment for commissioning manager(s). Minutes of commissioning workshop. Commissioning plan, schedule, specification and methodologies. Evidence of design reviews (where available). Where applicable, evidence that the specialist commissioning manager meets the definition for this role.	Copies of design reviews and commissioning records and reports (copies of all certificates are not required). Finalised commissioning plan, schedule, specification and methodologies. Where applicable, evidence that the specialist commissioning manager meets the definition for this role.
Handover		
8–9	Relevant section or clauses of the building specification or contract. OR A letter of commitment from the client or developer which is specific for the project being assessed. OR Draft building user guides and training schedule, where available.	A copy of the building user guides. Written confirmation from the design team or client that the guide has been, or will be, distributed to the building's owner, tenants or fit-out contractor (for completion), as appropriate. Copy of the training schedules, with confirmation that it was issued to the relevant people at the required time and that training was carried out in line with the schedules.

Definitions

Complex systems

These include, but are not limited to, air-conditioning, comfort cooling, mechanical ventilation, displacement ventilation, complex passive ventilation, BMS, renewable energy sources, cold storage enclosures and refrigeration plant.

Small-scale projects

For the purposes of this issue, small-scale projects are defined as projects up to 500 m² gross internal floor area or with a construction period of less than 12 weeks.

Small-scale projects may follow full requirements where preferred.

Specialist commissioning manager

An individual will meet the requirements of a specialist commissioning manager where:

1. They hold a recognised qualification for commissioning management and/or degree in mechanical, electrical or building services engineering or related field.
2. Have acquired substantial expertise through a minimum of three years relevant experience (within the last five years) in the building services industry, with a focus of mechanical and electrical commissioning.

Those accredited to a level of Senior Commissioning Manager under The Commissioning Specialists' Association (CSA) OR holding ASHRAE Building Commissioning Professional certification (BCxP) will be deemed to be specialist commissioning managers.

The commissioning manager must be independent from both those producing the design, and those involved in the installation works.

In principle, it is possible for the specialist commissioning manager to be from the same organisation as the main contractor provided any conflicts of interest have been declared and records show how they have been managed to provide confidence that commissioning will be carried out appropriately.

The separate roles of the main contractor and specialist commissioning manager are so that the installation and commissioning are carried out independently by different parties.

Additional information

Useful guidance

- Barker, K. Commissioning Air Systems (BG 49/2024), BSRIA; 2024.
- Hawkins G. Commissioning Job Book - A framework for managing the commissioning process (BG 11/2010). BSRIA; 2010.
- Lowry, M. Commissioning Responsibilities Framework (BG 88/2025), BSRIA; 2025.
- Parsloe C. Commissioning Water Systems (BG 2/2010). BSRIA; 2010.
- Ronceray M, Parsloe C. Pre-Commission Cleaning of Pipework Systems Amended 6th edition (BG 29/2021). BSRIA; 2021.
- Teekaram, A. Variable-flow water systems – Design, installation and commissioning guidance (AG 16/2002), BSRIA; 2002.
- ACG Commissioning Guideline. AABC Commissioning Group; 2005.
- Additional guidance documents can be found at ASHRAE (www.ashrae.org/technical-resources/bookstore/commissioning).

Man 05 Aftercare

(all buildings)

Aim

To provide post-handover aftercare to the building owner or occupants during the first year of occupation to ensure the building operates and adapts, where relevant, in accordance with the design intent and operational demands.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2 + 1 exemplary	Excellent	All (see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Scope of works – Local services and equipment** Criterion 2 is only applicable where the fit-out includes the installation of complex systems.
1.1	**Projects working to a standard corporate fit-out specification** Where the fit out is to a defined company specification and standard that is used recurrently and applied across all projects, the post occupancy evaluation credit can be filtered out where it is deemed to add no value due to the specification being developed through previous lessons learnt and user feedback.

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	**Zero carbon transition planning** Where the project is designed to be net zero carbon upon operation and uses no fossil fuels on-site (see M1.1), this credit will be filtered out.

Assessment criteria

One credit – In-use commissioning

1 An external consultant, aftercare team, or facilities manager will complete the following commissioning activities over a minimum 12-month period, once the assessed building area becomes substantially occupied (this applies to all projects even when outside the scope of the fit-out):

1.a Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback.

1.b Identify deficiencies and areas in need of improvement.

1.c Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals.

2 Where complex systems are installed as part of the scope of works a specialist commissioning manager will be required to perform the following commissioning activities over a minimum 12-month period, once the assessed building area becomes substantially occupied:

2.a Identify changes made by the owner or operator that might have caused impaired or improved performance.

2.b Test all building services under full and part-load load conditions (see CN1).

2.c Where applicable, carry out testing during periods of extreme (high or low) occupancy.

2.d Interview building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems.

2.e Compare sub-metered energy performance to the predicted energy performance.

2.f Identify inefficiencies and areas in need of improvement.

2.g Re-commission systems (following any work needed to serve revised loads) and incorporate any revisions in operating procedures into the operations and maintenance (O&M) manuals.

One credit – Post-occupancy evaluation

3 The client or building occupier commits to carry out a post-occupancy evaluation (POE) exercise one year after the assessed building area is substantially occupied. This gains comprehensive in-use performance feedback (see criterion 4.b.v) and identifies gaps between design intent and in-use performance. The aim is to highlight any improvements or interventions that need to be made and to inform operational processes.

4 The POE should cover:

4.a A review of the design intent and construction process (review of design, procurement, construction and handover processes).

4.b Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering:

4.b.i Internal environmental conditions (light, noise, temperature, air quality).

4.b.ii Control, operation and maintenance.

4.b.iii Facilities and amenities.

4.b.iv Access and layout.

4.b.v Energy and water consumption.

4.b.vi Other relevant issues, where appropriate.

5 A report which includes lessons learned should be provided to the client and building occupiers.

6 The client or building occupier commits funds to pay for the POE in advance.

One exemplary credit – Zero carbon transition planning

7 Where net zero carbon benchmarks are not met for operational performance and fossil fuels are being used on-site, a competent person develops a Zero Carbon Transition Plan demonstrating how the asset will achieve net zero carbon in operation by 2050 at the latest (see M1).

Methodology

M1: Zero carbon transition plan

Zero carbon transition plans are a relatively new market development. BREEAM assessments should follow a recognised best practice, or the plan should cover the contents listed below.

Overall ambition

Describe the strategic ambition of the asset's transition plan by disclosing its objectives, priorities, interim targets and milestones.

Implementation strategy

A description of the future energy and carbon reduction measures that would be implemented to eliminate on-site combustion and reduce energy use intensity to align with a 1.5°C pathway.

This should include:

— A timeline of measures to be implemented and the expected energy and carbon savings from each measure.

— The timeline of measure should be split into short-, medium- and long-term measures and define these terms.

— Any barriers to implementation, such as required grid upgrades etc.

Financial planning

Each measure should include estimated costs and savings.

Metrics and targets

To help assess progress against the Zero Carbon Transition plan, metrics and targets should be set and then progress reviewed on an annual basis. These should align with the Overall Ambition and the Implementation strategy. Targets should:

— Be clearly defined, including any relevant units, metrics and methodologies.

— Have a clear timeframe, defining a baseline and time period over which the target applies.

To ensure the Zero Carbon Transition Plan is implemented and evolves to reflect the latest technologies and costs:

1. Building owners and operators are encouraged to integrate the Transition Plan within the building's capital planning process to ensure alignment of budgets and timing.
2. Project teams are encouraged to pursue an in-use building performance certification scheme, such as BREEAM In-Use certification, once the asset is in operation, in order to verify the outcomes of implementing the Transition Plan and ensure that the plan is updated every three years.

For further links and guidance, see Additional information on page 71.

M1.1: No fossil fuels onsite

The scope of fossil fuel use on site includes all fossil fuel use by the building except for:

— Industrial scale process loads.

— Testing purposes within laboratory settings.

— Emergency and life safety systems such as firefighting, evacuation and back-up power in health care settings.

— Essential back-up systems serving buildings with functions where it is essential to maintain their continuous use, particularly in response to a disaster, for example hospitals, fire stations, police stations and emergency vehicle garages.

— Essential back-up systems serving data centres.

Compliance notes

Ref	Terms	Description
In-use commissioning		
CN1	In-use (seasonal) commissioning. See criterion 2.b.	Full and part-load conditions can vary by season and seasons will vary depending on locations. In temperate climates full-load conditions might be heating equipment in mid-winter and cooling equipment in mid-summer; part-load conditions would occur in spring and autumn. In tropical areas, consideration might be given to wet and dry seasons, for example.

Evidence

Criteria	Interim design stage	Final post-construction stage
In-use commissioning		
1–2	Relevant section or clauses of the building specification or contract. OR A letter of commitment from the client or developer. OR Appointment letters or commissioning responsibilities schedule where available.	In-use commissioning records/reports and records of occupant interviews. Where applicable, evidence that the specialist commissioning manager meets the definition for this role. Where a 15-month period has not passed since occupation of the building and full evidence is not yet available, the following should be provided: — Evidence of the appointment of a commissioning manager. — Schedule of commissioning responsibilities. — Confirmation of proposed commissioning dates. — Where some commissioning has taken place, but not all, these reports must be submitted.
Post-occupancy evaluation		
3–6	A signed and dated commitment by the client or developer or future building occupier.	Evidence to confirm that someone has been appointed to complete a POE, timeframe for completion and issue of report and schedule of responsibilities which fulfils the BREEAM criteria. Where 15 months have passed since building occupation, a copy of the POE report must be provided.
Zero carbon transition planning		
7	Relevant section or clauses of the building specification or contract. OR A letter of commitment from the client or developer.	Copy of compliant zero carbon transition plan.

Definitions

Complex systems

These include, but are not limited to, air-conditioning, comfort cooling, mechanical ventilation, displacement ventilation, complex passive ventilation, building management systems (BMS), renewable energy sources, cold storage enclosures and refrigeration plant.

Competent person – Zero carbon transition plan

This would be a person or organisation that has sufficient knowledge and expertise of scenario analysis, financial planning, carbon risk and opportunity analysis and carbon accounting, specifically in real estate.

For further links and guidance, see Additional Information.

In-use commissioning

This includes a programme of post-occupancy fine-tuning and seasonal testing. The seasonal testing evaluates how the building and its building services are performing under full load conditions during peak heating and cooling seasons, as well as part-load conditions in spring and autumn. This is to ensure that the building systems and control strategy are working correctly, efficiently and as designed or intended, including interfaces between systems. It is an opportunity to ensure that occupants are using systems correctly, systems are set up correctly and to make adjustments where required.

Other relevant issues

Other relevant issues include the following:

- Health, safety and wellbeing.
- Building user information including training for building users and operators.
- Value for money, achievement of business objectives.
- Sector–specific issues, such as impacts on absenteeism in offices, infection rates in healthcare facilities, pupil performance in schools etc.
- Sustainability performance (performance of any sustainable features or technologies, e.g. materials, renewable energy, rainwater harvesting etc.).

Post-occupancy evaluation (POE)

A post-occupancy evaluation (POE) is also known as Building Performance Evaluation (BPE).

The POE is used to improve the building operation, occupants' comfort and other areas based on its outcomes. Therefore, the POE provides suggestions on potential improvements, including, but not limited to the following:

- Re-commissioning activities
- Measures that maintain or improve end users' comfort and productivity
- Health and safety

A POE can also be used as part of the stakeholder consultation at the briefing stage for a new building or the refurbishment of an existing one, in cases where the building occupants are the same. This can be achieved through the use of a questionnaire or workshops to highlight lessons from the old or existing building that could be taken into account in the design of the new project.

POE methodologies

Any POE or BPE methodology that fulfils the criteria can be used. Further guidance on POE can be found in the following resources:

- Post Occupancy Evaluations | WBDG - Whole Building Design Guide.
- BCO Guide to Post Occupancy Evaluation (POE), British Council for Offices, 2023.
- BRE Digest 478, Building performance feedback: getting started, Building Research Establishment, 2003.
- Guide to Post Occupancy Evaluation Report and Toolkit, HEFCE, AUDE & University of Westminster, 2006.
- The Building Use Studies (BUS) methodology (busmethodology.org.uk) is an occupant satisfaction survey that will fulfil part of the POE credit requirement, occupant feedback stage.
- BSRIA Guide to Building Performance Evaluation is a general introduction to BPE. BSRIA; 2015. 27 CIBSE. GVF2012 Guide F: Energy.

Specialist commissioning manager

An individual will meet the requirements of a specialist commissioning manager where:

1. They hold a recognised qualification for commissioning management and/or degree in mechanical, electrical or building services engineering or related field.
2. Have acquired substantial expertise through a minimum of three years relevant experience (within the last five years) in the building services industry, with a focus of mechanical and electrical commissioning.

Those accredited to a level of Senior Commissioning Manager under The Commissioning Specialists' Association (CSA) OR Holding ASHRAE Building Commissioning Professional certification (BCxP) will be deemed to be specialist commissioning managers.

In principle, it is possible for the specialist commissioning manager to be from the same organisation as the main contractor provided any conflicts of interest have been declared and records show how they have been managed to provide confidence that commissioning will be carried out appropriately.

The separate roles of the main contractor and specialist commissioning manager are so that the installation and commissioning are carried out independently by different parties.

Substantially occupied

For the purposes of this BREEAM issue, a building or assessed refurbished area is considered as substantially occupied when approximately 80% of each building function area, applicable to the assessment, is occupied.

Additional information

Absence of predicted performance data

Where building occupiers do not have predicted performance models, it may be more appropriate to benchmark actual building performance data with other sources of Building Performance Evaluation Data and benchmarks. The following CIBSE sources of building benchmarking information are internationally recognised:

- CIBSE Guide F: Energy Efficiency in Buildings
- CIBSE TM46: Energy Benchmarks
- CIBSE TM47: Operational Ratings and Display Energy Certificates

Additional information of building performance and benchmarking can be found at Buildings Performance Institute Europe (BPIE) (www.bpie.eu) and ASHRAE (www.ashrae.org).

Actual vs predicted performance

In most cases it is not feasible to accurately compare predicted vs actual performance due to variances in the assumptions used in the models. Figures reported via the UK's Carbon Buzz website show that on average, buildings consume between 1.5 and 2.5 times the predicted values. When comparing predicted with actual values, an analysis should be carried out to understand why there may be discrepancies in performance. These discrepancies can be for several reasons including:

- Predicted energy consumption is normally based upon building regulation compliance models which only focus on 'regulated' energy use. Additional unrelated energy use may not have been modelled in the design prediction model.
- They may be extended use due to extra occupancy and operating hours, not accounted for in the predicted models.
- Inefficiencies from poor control, bad commissioning or poor maintenance.
- Additional special functions such as a cafeteria, server rooms etc. not accounted for in the predicted model.
- Variances in actual occupant behaviour that vary from predicted, such as use of small power and lighting.

CIBSE TM54 Evaluating Operational Energy Performance of Buildings at the Design Stage (2022) provides guidance on how to improve the accuracy of the model for operational energy use of buildings at the design stage.

Zero carbon transition plan

For additional guidance on preparing a zero carbon transition plan and organisations who may provide support, please refer to:

- CDP (www.cdp.net), including CDP Technical Note: Reporting on Climate Transition Plans which provides requirements for a credible climate transition plan.
- International Transition Plan Network (ITPN) (itpn.global/tpt-legacy/)
- The Transition Plan Taskforce (TPT) (transitiontaskforce.net)
- Corporate Sustainability Reporting Directive (CSRD) (www.carbontrust.com/news-and-insights/insights/corporate-sustainability-reporting-directive-csrd-explained)
- Science Based Targets Initiative (sciencebasedtargets.org)

Health and wellbeing



Summary

This category encourages the increased comfort, health and safety of building occupants, visitors and others within the vicinity. Issues in this section aim to enhance the quality of life in buildings by recognising those that encourage a healthy and safe internal and external environment for occupants.

Assessment issues

Hea 01 Natural light	up to 5 + 1 exemplary
Hea 02 Electric light	2 credits + 1 exemplary
Hea 03 Non-visual effects of light	1 credit
Hea 04 Indoor air quality	up to 6 credits + 3 exemplary
Hea 05 Thermal comfort	2 credits
Hea 06a Acoustic performance	up to 4 credits
Hea 06b Acoustic performance	up to 4 credits
Hea 07 Safe and accessible design	1 credit + 1 exemplary

Hea 01 Natural light

(all buildings)

Aim

To ensure daylighting is considered at the design stage and ensure best practice in visual performance, visual comfort, and overall wellbeing for building occupants.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 5 + 1 exemplary (building type dependent)	None	All (see ref 1.0 and 1.1)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Fit out application** It is recognised that fit-out projects will have limited influence over fabric measures that can increase natural light. The criteria are applicable to assess the impact of changes to internal layout on daylighting and view out (e.g. location of partitions, use of glare control film on glazing etc.) to recognise fit-out projects that optimise the percentage of spaces that benefit from daylighting and view(s) out.
1.1	**Glare control and View out – No relevant area** If the scope of the assessment does not include any relevant building areas (see Definitions) for glare control and/or view out, the respective criteria are not applicable and the credit is filtered out.

Building type specific notes

Ref	Building type specific note
2.0	**Residential institution (long-term stay) – Living rooms** **Residential care home – Communal lounges, individual bedrooms** All relevant areas are to be within 5 m of a wall which has a window or permanent opening providing an adequate view out. The window or opening must be ≥ 20% of the surrounding wall area.
2.1	**Residential institutions and Hospitality – Bedrooms** Glare is not considered to be problematic in bedrooms in Residential institutions (long-term stay and short-term stay) and Hospitality assessments where the occupants are assumed to be elsewhere during the daylight hours. The only exception to this is where designated additional office working space is provided within a bedroom. In these circumstances it is the role of the assessor to determine if individual spaces should be determined as 'relevant building areas' in accordance with guidance provided.
2.2	**Commercial kitchens** It is not necessary to provide a view out for commercial kitchens. This is because in such a space it is likely that kitchen staff will move around, doing various tasks. This makes the requirements for the view out to rest the eyes unnecessary.
2.4	**Prison buildings – Cells** An adequate view out from a normal standing or sitting position. The distance between each window and nearest external solid object (i.e. buildings, screens, walls or fences) is ≥ 10m. Where existing features prevent compliance with this criteria in less than 20% of the cells within the building, the credit can still be awarded.

Assessment criteria

One credit – Glare control

1 Identify areas at risk of glare using a glare control assessment. The glare control assessment also justifies any areas deemed not at risk of glare.

2 Where risk has been identified within a relevant building area, a glare control strategy is used to design out the potential for glare (see M1).

3 The glare control strategy does not increase energy consumption used for lighting. This is achieved by:

3.a Maximising daylight levels in all weather (cloudy or sunny).

AND

3.b Ensuring the use or location of shading does not conflict with the operation of lighting control systems.

Up to two credits – Daylighting

4 Calculate the percentage of relevant area that meets the minimum performance requirements for glazed area as a percentage of floor area (see M2.1). The number of BREEAM credits awarded is given in Table 13.

Table 13: Daylighting performance scale

BREEAM credits	Percentage of relevant area that meets the daylighting minimum performance requirements
1	≥ 80%
2	100%

One credit – Direct sunlight to windows

(Healthcare, Residential institutions – Long-term stay, Prisons)

5 Achieve at least one credit for 'Daylighting' (criterion 4).

6 All relevant units have at least one relevant area that receives at least 3 hours of direct sunlight at windows on equinox day (21 March or 21 September, as the average representation of annual conditions) assuming a cloudless sky (see M3).

One credit – View out

7 At least 95% of the floor area in 95% of spaces for each relevant building area are within the distances of a window or permanent opening that provides an adequate view out (see Definitions and M4), as outlined in Table 14 below.

Table 14: Window or opening size required as a percentage of surrounding wall area depending on the distance of the desk or workspace to the window or opening

Distance from window to workspace or desk, X (in metres)	Window or opening size (as % of surrounding wall area)
X < 8	20%
8 ≤ X ≤ 11	25%
11 < X ≤ 14	30%
X > 14	35%

OR

8 At least 75% of the floor area in 95% of spaces for each relevant building area can meet both of the following criteria:

8.a Horizontal sight angle ≥ 28°.

AND

8.b The landscape layer and at least one additional layer (sky or ground) are visible through a permanent opening (see M4.4).

One exemplary credit – Evaluating glare from daylight

9 Achieve the credit for 'Glare control' (criteria 1–3).

10 An evaluation has been undertaken to demonstrate compliance with either of the following and M5:

10.a The Daylight Glare Probability (DGP) does not exceed 0.40 over more than 5% of annual operating hours at all workstations in all relevant building areas.

OR

10.b Annual Sunlight Exposure ASE1000, 250 ≤ 10% of an occupied space. This means no more than 10% of the occupied space in all relevant building areas can receive a daylight illuminance of ≥ 1000 lux for ≥ 250 hours per year.

Checklists and tables

Table 15: Minimum performance requirements for glazed area as a percentage of floor area in occupied space

Latitude	< ± 40°	≥ ± 40° < ± 45°	≥ ± 45° < ± 50°	≥ ± 50° < ± 60°	≥ ± 60°
Glazed area to floor area	≥ 7%	≥ 8%	≥ 9%	≥ 10%	≥ 11%

Methodology

M1: Glare control

M1.1: Glare control assessment

A glare control assessment is used to determine the areas of the building that are at risk of glare, including a demonstration of the building areas not at risk. This can be achieved through a survey of or modelling of the relationship between sunlight and the building. The design must consider the possibility of glare from all sources, including direct sunlight, reflected sunlight and contrast glare. Design studies can be used to demonstrate that glare cannot reach the eyes of building occupants, or the computer screens they are using, during occupied hours.

Where compliant shading measures are specified for all relevant building areas regardless of the risk of glare, a glare control assessment will not be necessary. The glare control strategy must demonstrate building design measures are specified for all relevant building areas, while also complying with criteria 3 to 3.b.

It is acceptable to account for surrounding buildings, structures or other permanent environmental features when using simulation modelling to assess the risk of glare, provided this accounts for both direct sunlight and reflected glare from glazing or reflective surfaces.

Where roof lights are present, they must be considered when demonstrating that the glare control strategy provides adequate control/measures for minimising glare in that space.

M1.2: Assessing compliant forms of glare control

Compliant shading measures for meeting glare control criteria are:

1. Internal, mid-pane, or external shading such as opaque Venetian or close weave fabric blinds where:
    a. The openness factor of blinds is ≤ 1% and the fabric light transmittance value is ≤ 0.1 (10%).

    OR

    b. The openness factor of blinds is ≤ 3% and the fabric light transmittance value is ≤ 0.03 (3%).

    OR

    c. The shading is classified as class 3 or 4 in accordance with Table 7 of EN 14501:2021.
2. The shading can be occupant controlled or automatically controlled with manual override.

The following measures can be used in addition to the above, but are not compliant on their own:

- Building-integrated measures (e.g. overhangs, brise-soleil, fins, or light shelves).
- Variable transmittance glazing (e.g. electrochromic, photochromic, or thermochromic glass).
- Window films and tinted glazing.

Transmittance values should be based on those quoted for 'visible light' or 'optical transmittance'.

Glare control must provide shading from both high-level summer and low-level winter sun where relevant to the location of assessment. Design studies can be used to demonstrate the sunlight is prevented from reaching the eyes of building occupants, or the computer screens they are using, during occupied hours.

M1.2.1: Alternative shading measures

Variable transmittance glazing (e.g. electrochromic, photochromic, or thermochromic glass) as well as window films can reduce glare from the bright sky but may have little impact on glare from the sun. Therefore, such shading options should be used in conjunction with other glare control measures in all cases where control of glare from the sun is required.

Solar control or 'tinted' glazing could potentially support the attainment of this requirement. It should be noted that whilst certain types of glazing, such as low emissivity glazing, may be slightly tinted, they may not necessarily be effective in reducing disabling glare. For facades receiving direct sunlight, tinted windows alone are unlikely to be sufficient in most situations. The assessor must provide evidence to demonstrate that the particular glazing type, when used on the assessed building for a given location, meets the overarching aim of preventing disabling glare.

Curtains (where used without other forms of shading) do not meet the criteria for the glare control credit. This is because they do not provide sufficient control to optimise daylight into the space. As such, the use of curtains to control glare is likely to cause occupants to rely more on artificial lighting.

M1.3: Applicability of glare control – Atrium spaces

The 'Glare control' criteria are applicable to all spaces that meet the definition for 'relevant building areas – glare control'. This includes reception and atrium spaces where these spaces meet this definition. Where an atrium space does not meet the definition of 'relevant building areas – glare control' it does not need to comply with the criteria. However, the risk of glare must be considered for any relevant building areas that connect off the atrium space. This is because sunlight could pass through the atrium causing discomfort for users of other relevant building areas that connect to the atrium space. Where this is the case, building design measures or the provision of shading will be required to enable glare to be controlled or eliminated.

M2: Daylight

M2.1: Calculating glazed area as a percentage of floor area in occupied spaces and assessment against the minimum performance requirements

The following steps must be followed in order to assess whether the asset demonstrates compliance with the minimum performance requirements. Where daylight needs to be excluded from or lighting conditions need to be strictly controlled in an occupied space, e.g. media or arts production areas, special education needs sensory space or x-ray rooms, these spaces can be excluded from assessment.

1. Determine the latitude for the asset's location.
2. Calculate the net internal area (m²) for each relevant occupied space and the total net internal area (m²) for all relevant occupied spaces.
3. For each relevant occupied space, calculate the total glazed area (m²) of all windows and roof lights within the space. The frames are not included in the calculation, only the area of glass.
4. For each relevant occupied space, calculate the percentage of glazed area to floor area as follows:

$$Percentage\ glazed\ area\ to\ floor\ area = \left(\frac{Total\ glazed\ area\ in\ occupied\ space}{Net\ internal\ area\ of\ occupied\ space} \right) \times 100$$

5. For occupied spaces with tinted or diffusing glazing, it is necessary to apply a glass transmittance weighting to the glazed area to floor area percentage. For clear or low emissivity single, double or triple glazing, no weighting correction is required. For tinted or diffusing glazing, the glazing to floor area percentage is multiplied by T/0.8, where T is the light

transmittance of the glazing (expressed as a decimal). If the glass transmittance is not known, the glazing to floor area percentage is multiplied by 0.25 for tinted glazing and by 0.60 for diffusing glazing.

6. For each relevant occupied space, check that no part of the occupied space is more than X metres on plan from the glazed area, where X is three times the height of the top of the glazed area above the floor level. For example, if the height to the top of a glazed area from the floor is 3m, then no part of the occupied space must be further than 9m from the glazed area. Where an occupied space does not meet this distance requirement, it is not possible for the space to comply with the minimum performance requirements.
7. For each relevant occupied space, check if there are any external obstructions (e.g. adjacent buildings or structures, trees or hedges, etc.) that will potentially limit the amount of daylight reaching the space. If there is an obstruction, its horizontal distance away from the glazing must be greater than its height above the centre of the glazing. For example, if an obstruction's height is 10m above the centre of the glazing, then the obstruction must be at least 10m away from the glazing. Where an obstruction does not meet this distance requirement, the obstructed glazing does not count towards the total glazed area in the calculation.
8. For each relevant occupied space, compare the transmittance weighted glazed area to floor area percentage to the minimum performance requirements in Table 15 on page 75 for the asset's latitude to assess whether the occupied space is compliant or not.
9. Calculate the percentage of all relevant occupied space within the asset that meets the minimum performance requirements in accordance with steps 4 - 8 above, and therefore determine the number of credits that can be awarded, as follows:

$$Percentage\ of\ relevant\ occupied\ space = \left(\frac{Total\ net\ internal\ area\ of\ compliant\ occupied\ space}{Total\ net\ internal\ area\ of\ all\ relevant\ occupied\ space} \right) \times 100$$

M2.2: Daylighting calculations, measurement and simulation

Where daylighting calculations, measurement or simulation have previously been performed for the asset, for example as part of the asset's design and construction, and there have been no changes to the layout or glazing in relevant occupied space and there are no new external obstructions, then these studies may be used as an alternative method of demonstrating compliance with the criteria.

The daylighting studies must demonstrate that daylight levels in ≥ 80% of relevant occupied space meet local good practice requirements (e.g. achievement of the BREEAM New Construction or Refurbishment and Fit-out scheme 'Daylighting' credits).

M3: Direct sunlight

M3.1: Relevant building areas

Relevant units must each be assessed separately with at least one relevant area from each unit meeting the criteria.

M3.2: Calculation

The criterion applies to rooms of all orientations, although if a room faces north of due east or west it is less likely to be met (as experienced in the northern hemisphere).

A geometrical calculation model should be used and include in detail any surrounding obstructions and surfaces outside the room that could affect the sunlight received. Surface reflectances are not needed for this calculation. The amount of sunlight received can be determined using either a manual procedure or adequate software. Further reference can also be made to EN 17037, Annex D.(1)

Where window positions are already known, a reference point on the inside face of the window aperture at the centre of the opening width and at least 1.2 m above the floor and 0.3 m above the sill (whichever is the higher) should be used. For a horizontal daylight opening (such as a rooflight), the reference point should be taken at the geometrical centre on the inside face of the opening.

Window reveals, balconies and overhangs that block sunlight must be included in the assessment, but the effect of window frames and bars can be discounted.

If a room has multiple windows, the amount of sunlight received by each can be added together provided they occur at different times and sunlight hours are not double counted.

M4: View out

M4.1: Relevant building areas

The view out criteria apply to all 'relevant building areas'. The assessment is based on distinct spaces that are considered relevant building areas. These are referred to as 'relevant spaces'.

- A relevant space is compliant where the required percentage of the floor area has an adequate view out.
- Credits are awarded based on the percentage of all relevant spaces that are compliant.

For example, 19 out of 20 relevant spaces have adequate view out for 95% of each separate space's floor area. This results in 95% of the relevant spaces meeting the view out requirements, from which the number of available credits can be determined.

Where rooms contain areas of different functions, only relevant areas should be assessed. In this case a notional line can be drawn on the plans and calculations made based on these relevant areas only. However, spaces such as circulation routes or other transient spaces within a relevant area can only be excluded if the route or area is clearly defined by the building layout. If this is arbitrary or based solely on a proposed furniture layout, it cannot be excluded. Features of the building layout which may be considered as dictating a function area would include, for example, the position of doors, columns or fixed furniture such as a reception desk or canteen servery.

M4.2: Calculating the window to wall ratio

This should be calculated based on the glazed area of window or opening, expressed as a percentage of the surrounding wall area.

The frames are not included in the calculation, only the area of glass. The external wall area also includes the area of the window or opening itself.

Where the ceiling height of the room is unusually high, relative to the window height, the wall area can be calculated based on a standard ceiling height for the building type.

Where there are windows or openings in different walls within a space, each desk or workspace only needs to have one compliant view out. In this situation, the window or opening nearest to each relevant area will most likely meet criterion 7.

M4.3: Horizontal sight angle

This defines the width of the view from a specific reference point in the assessed space.

To assess the horizontal sight angle over a room area, a horizontal grid should be built as illustrated in Figure 2 on the next page. The grid spacing should be no more than 0.3 metres in residential applications and no more than 0.5 metres in non-residential applications. The horizontal sight angle as formed by the view opening reveals should be determined at each grid point, and then the percentage room area with a horizontal sight angle above a certain threshold can be calculated from the percentage of grid points exceeding that threshold.

Where a space has more than one opening, the horizontal sight angle at a reference point can be taken as the sum of the horizontal single angles determined for each opening as seen from the reference point unless the openings are on opposite walls. Further reference can also be made to EN 17037, Annex C.(2)

In Figure 2 on the next page below, the medium and high grid points (highlighted in green) meet the horizontal sight angle threshold of above 28°. The reception circulation area has been excluded in line with M4.1, based on the location of a reception desk and area. As the compliant area is less than 75% of the relevant floor area, this example would not meet criteria 8.a.

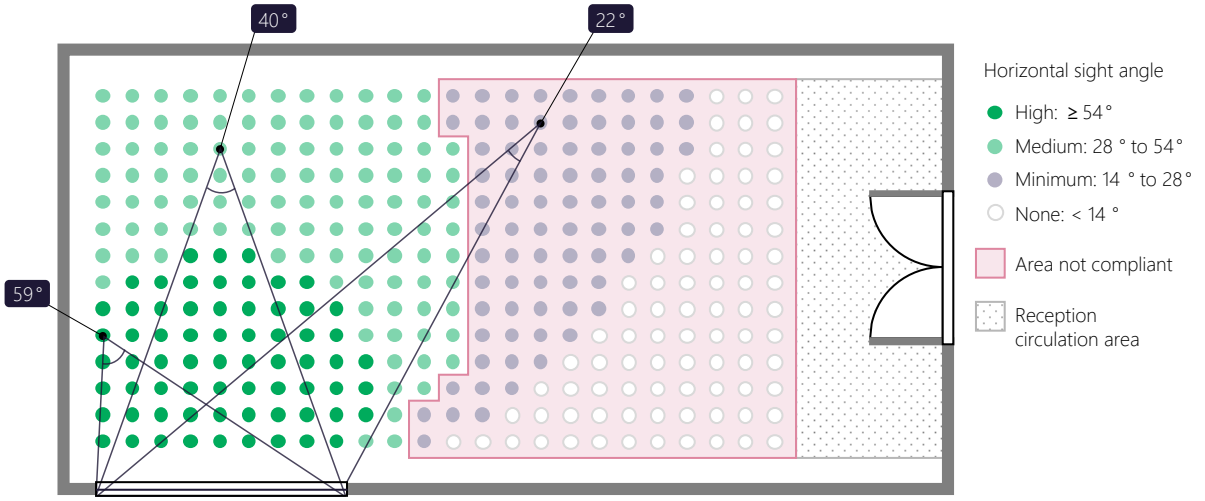


Figure 2: Example of horizontal sight angle assessment in a space with one opening (circles indicate grid points)

M4.4: View layer

A view is considered to comprise three distinct layers: the sky layer; the landscape layer; and the ground layer. The ground layer can include information of activities, whilst the landscape layer can consist of buildings, nature, a combination of these, or only the horizon. The more view layers are visible from a reference point, the higher the view quality for that point.

To assess the number of visible view layers over a room area, a horizontal grid should be built as illustrated in Figure 2 above. The grid spacing should be no more than 0.3 metres in residential applications and no more than 0.5 metres in non-residential applications. The number of visible view layers should be determined at each grid point, and then the percent room area with the number of visible view layers above a certain threshold can be calculated from the percentage of grid points exceeding that threshold.

Where a space has more than one opening, the number of visible view layers at a reference point can be taken as the number of visible view layers seen from the reference point through all openings that are not on opposite walls.

M5: Evaluating glare from daylight

M5.1: Daylight Glare Probability

Daylight Glare Probability (DGP) is a discomfort glare metric developed for side lit spaces. It factors in vertical daylight illuminances at the eye as well as brightness and position of potential sources of glare in the visual field of an observer.

Guidance Note 50 provides guidance on the methodology and application of the Daylight Glare Probability requirements. EN 17037 uses DGP to assess protection from glare for spaces where the activities are comparable to reading, writing, or using display devices and the occupants are not able to choose position and viewing direction.

Compliance with the BREEAM exemplary level criteria is achieved if for all workstations in all relevant building areas the calculated DGP value does not exceed 0.40 over more than 5% of annual operating hours.

The DGP assessment can be applied to a space with vertical or inclined daylight openings, but this method is not applicable for a space with daylight openings in a horizontal surface (such as rooflights). In the later case the Annual Sunlight Exposure (ASE) method should be used.

Additionally, DGP cannot be applied to cases where vertical illuminance is not expected to be a good indicator for the perception of glare; for example, vending areas of shops, sports halls and deep or dark spaces with very small daylight openings. Furthermore, DGP cannot be applied to positions in a space which are far away from daylight openings or receive low daylight levels.

M5.2: IES LM-83 – Annual Sunlight Exposure

Annual Sunlight Exposure (ASE) is a measure of sunlight to suggest if a space is over-sunlit with the potential for glare or heat gains. Whilst ASE is not a direct measure of glare, it can indicate the potential for glare if sunlight exposure exceeds a certain limit.

Guidance Note 50 provides guidance on the methodology and application of the Annual Sunlight Exposure requirements. Compliance with the BREEAM exemplary level criteria is achieved if in all relevant building areas, ≤ 10% of the regularly occupied space can:

1. Receive a daylight illuminance of ≥ 1000 lux.
2. For ≥ 250 hours per year.

In other words, at least 90% of the regularly occupied space in all relevant building areas can receive no more than 1000 lux from daylight over no more than 250 hours per year.

Compliance notes

Ref	Terms	Description
Glare control		
CN1	No windows in relevant areas	Where a relevant area does not include any windows, the glare control criteria can be considered as met for this area. Note that the view out and daylighting criteria would not be achieved in rooms with no windows.
View out		
CN2	First aid rooms	The view out criteria do not apply to dedicated first aid or medical rooms in non-healthcare projects.
CN2.1	Security and sensitive rooms	The view out criteria do not apply to rooms containing security, critical systems or sensitive material, such as CCTV monitoring rooms, where the presence of compliant windows would compromise a critical function of the space.
CN2.2	Exclusion of non-relevant areas	Only relevant areas within rooms should be assessed. However, spaces such as circulation routes or other transient spaces within a relevant area can only be excluded if the route or area is clearly defined by the building layout, this is further explained within M4.1.

Evidence

Criteria	Interim design stage	Final post-construction stage
Glare control		
1–3	Design drawings and relevant section or clauses of the building specification or contract. Glare control assessment, where required.	Assessor site inspection report and photographic evidence. Final construction drawings or equivalent. Where relevant, manufacturer's data sheets or product literature. Glare control assessment, where required.
Daylighting		
4	Design drawings and daylight calculations. OR Relevant section or clauses of the building specification or contract confirming BREEAM requirements.	Final construction drawings or equivalent or assessor site inspection report and photographic evidence. Daylight calculations, where not provided at design stage or updated. Confirmation from the design team that daylighting is in accordance with BREEAM requirements.
Direct sunlight to windows		
5–6	Design drawings and calculations (manual or computer simulated).	Where not provided at design stage or updated, calculations (manual or computer simulated).

Criteria	Interim design stage	Final post-construction stage
	OR Relevant section or clauses of the building specification or contract confirming BREEAM requirements.	Assessor site inspection report and photographic evidence. OR Final construction drawings or equivalent.
View out		
7–8	Window schedules, calculations and design drawings with marked up floor plans depicting relevant zones and sight lines.	Assessor site inspection report and photographic evidence. OR Final construction drawings or equivalent. Updated calculations where required.
Evaluating glare from daylight		
9–10	Design drawings and calculations.	Assessor site inspection report and photographic evidence. OR Final construction drawings or equivalent. Updated calculations where required.

Definitions

Adequate view out

BREEAM defines an adequate view out as a view of a landscape or buildings (rather than just the sky) at seated eye level (1.2m) within the relevant building areas and should ideally be through an external window. A view into an internal courtyard or atrium will comply provided the distance from the opening to the back wall of the courtyard or atrium is at least 10m (therefore allowing enough distance for the eyes to refocus). The view cannot be an internal view across the room, as this is likely to become obstructed by partitions, filing cabinets etc.

Occupied space

A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user.

Reflectance

The ratio of the luminous flux reflected from a surface to the luminous flux incident on it.

Relevant building area – Daylighting

For BREEAM, this is defined as areas within the building where good daylighting is of benefit to the building users if it is an occupied space.

This includes the following, specifically stated because they are often omitted:

1. Sports hall exercise spaces
2. Laboratory areas (unless the type of research that will be carried out requires strictly controlled environmental conditions, such as the exclusion of natural light)
3. Self-contained flats
4. Kitchen and catering areas
5. General communal areas
6. Small offices (including those within residential buildings and residential institutions)
7. Meeting rooms (including those within residential buildings and residential institutions)
8. Leisure areas
9. Any area that may involve close up work.

However, this excludes the following (where present):

1. Media, arts production, SEN sensory spaces, x-ray rooms and other areas requiring strictly controlled acoustic or lighting conditions.

2. Clinical areas with controlled environmental conditions, e.g. operating theatres, delivery rooms or pathology. However, BREEAM strongly advises that the benefits from daylighting and view out are seriously considered when designing areas of critical and intensive care in healthcare buildings.

Relevant building area – Direct sunlight

For direct sunlight, only occupied living areas within the unit are required to assess the provision of direct sunlight. For example, within a healthcare building this would include in-patient bedrooms and day care living rooms.

Relevant building area – Glare control

Glare control criteria apply to areas of the building where resultant glare could be problematic for users. This includes, but not exclusively:

— Areas that have been designed to contain or use workstations or projector screens (such as offices, study bedrooms, libraries, facility management offices and reception desks).

— Areas where people must spend time in fixed locations and cannot change their viewing direction (such as classrooms and hospital wards).

— Sports halls.

— Areas where occupants are expected to spend a significant amount of time in the day (such as care home bedrooms).

Building areas described above should not be assessed when they are excluded for the daylight and view out criteria.

Relevant building area – View out

The aim of the view out criteria is to allow occupants to refocus their eyes from close work. Relevant areas are spaces where close work in a fixed position is carried out for sustained periods of time. The view out criteria is therefore not applicable to occupied areas such as meeting rooms, or other spaces where such close work is not being carried out.

BREEAM defines relevant building areas requiring a view out to include spaces where close work in a fixed position is carried out for sustained periods of time:

1. There are or will be workstations or benches or desks for building users.
2. Close work will be undertaken, or visual aids will be used.
3. Occupants spend a significant amount of time, and a view out is deemed to be of benefit to the building occupants, this includes:
    a. Bedrooms (Residential care home)
    b. Living rooms (Residential institution – long-term stay, and Residential)

Excluded areas for view out might include:

— Conference rooms, meeting rooms, lecture theatres, sports halls, acute SEN rooms, kitchens.

— Any spaces where the exclusion or limitation of natural light is a functional requirement (such as laboratories or media spaces).

— Individual booths or enclosed workstations that are intended for temporary non-permanent work.

— Bedrooms where occupants mainly use the space for sleeping, such as in hospitality, residential institutions (long- and short-term stay) and bedrooms that are not specified above and in building type specific note 2.1.

Relevant spaces – View out

A distinct space that falls within the definition of 'relevant building area'.

Relevant unit – Direct sunlight

A relevant unit would be a distinct building or space intended for single residential-like occupancy type. Where units are self-contained, such as a house or flat each self-contained unit must be considered separately. Where there are shared communal areas such as in a residential care home, then the whole care home can be considered one relevant unit. In a healthcare scenario, a healthcare ward that overnight patients have direct access to would be considered one unit.

Surrounding wall area

Surrounding wall area refers to the internally measured area (in m²) of the external wall on which the window or opening is located, including the area of the window or opening itself.

Working plane

The CIBSE SLL Lighting Handbook and the CIBSE SLL Code for Lighting define the working plane or the reference plane as the plane at which work is normally done.

Additional information

None.

Hea 02 Electric light

(all buildings)

Aim

To ensure artificial lighting and occupant controls are considered at the design stage to ensure best practice in visual performance, visual comfort, and overall wellbeing for building occupants.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2 + 1 exemplary	None	All (see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Internal lighting, Zoning and controls, Lighting control** If no material changes are being made to the internal lighting (criteria 2–3) and/or zoning and control of lights (criteria 4–9) due to the scope of the fit-out works, then the respective credits can be filtered out.

Building type specific notes

Ref	Building type specific note
2.0	**Hospitality – lighting levels in hotel bedrooms** Internal lighting levels in hotel bedrooms will not usually need to conform to national best practice levels for offices as these spaces are not generally used as a workspace. However, if hotel bedrooms, or rooms within a hotel suite, are intended to be used as workspaces, similar to a small office, the lighting levels should conform to national best practice levels for this type of space.
2.1	**Lighting control – Healthcare, Residential institutions, and Hospitality** To meet criterion 9, flicker must be met across entire dimming range, down to minimum specified dimming level as set out in M3.1. The dimming ranges in alternative standards in M1 cannot be used. This is because residential type assets regularly use the full dimming range, often before sleep and prevention of flicker during this period should be met.
2.2	**Prison buildings** **Cells:** Lit to a maintained illuminance of 200 lux at table top level. In addition, there must be the facility (using, for example, dimming, step switching or separate task and general lighting) for the occupant of the cell to select a lower level of general lighting if required. **Exercise yards:** Lit to a maintained illuminance of at least 10 lux. However, if such spaces are, or will be, used as sports facilities they must be lit to a maintained illuminance of 100 lux.

Assessment criteria

Prerequisite – Flicker

1 All lighting should be designed to minimise flicker and stroboscopic effects (see M1). This is applicable to all internal and external lighting.

One credit – Internal lighting

2 Internal lighting in all relevant areas of the building is designed to comply with all applicable recommendations in EN 12464-1:2021[3], SLL Code for Lighting 2022[4] or an approved alternative national standard. Internal lighting should be appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. This can be demonstrated through a lighting design strategy that provides lighting parameters in accordance with national best practice lighting guides (see CN2 on page 88). Compliance criteria must include, as applicable for each type of application:

- 2.a Illuminance levels and uniformity
- 2.b Glare limits
- 2.c Colour appearance (where standard recommendations exist)
- 2.d Colour rendering

3 For areas where computer screens are regularly used, specific confirmation is required that the lighting has been designed to limit the potential for glare in accordance with a numerical glare limit specified within national best practice lighting guides. These should include:

- 3.a Limits to the luminance of the luminaires to avoid screen reflections. Manufacturers' data for the luminaires should be sought to confirm this.
- 3.b For uplighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this.
- 3.c Recommendations for direct lighting, ceiling illuminance, and average wall illuminance.

One credit – Zoning and occupant control

4 Internal lighting is zoned to allow for occupant control in accordance with the criteria below for relevant areas present within the building, as applicable:

- 4.a Workstations adjacent to windows or atria and other building areas are separately zoned and controlled.
- 4.b In office areas where furniture layout is known: zones of no more than four workplaces.
- 4.c Seminar and lecture rooms: zoned for presentation and audience areas.
- 4.d Library spaces: separate zoning of stacks, reading and counter areas.
- 4.e Teaching space or demonstration area.
- 4.f Whiteboard or display screen.
- 4.g Auditoria: zoning of seating areas, circulation space and lectern area.
- 4.h Dining, restaurant, café areas: separate zoning of servery and seating or dining areas.
- 4.i Retail: separate zoning of display and counter areas.
- 4.j Bar areas: separate zoning of bar and seating areas.
- 4.k Day rooms, waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff.
- 4.l Hotel bedrooms: separate zoning of hallway, bathroom, desk and sleeping area (where present in the room).

5 Where automatic lighting controls are used for energy efficiency reasons, manual override must be provided.

6 In addition, the building type criteria in Table 16 below (where relevant).

Table 16: Building-specific zoning and control requirements

Building type	Internal and external lighting requirements
Education buildings	Manual lighting controls are easily accessible for the teacher while teaching and on entering or leaving the teaching space. Manual lighting controls need only be provided for staff, not the children.

Building type	Internal and external lighting requirements
Law court buildings	Separate zoning is also provided for the following areas (as a minimum): 1. Judge's or magistrate's bench 2. Dock 3. Jury area 4. Public seating area Lighting control of the zones in the above spaces, and the court as a whole, cater for the following settings: 1. Full lighting (to allow cleaning etc.). 2. Normal lighting (for court sessions). 3. Dimmed (for the purpose of showing audio-visual evidence, but allowing enough light for note taking).
Internal areas excluded from the lighting zone requirements	The following internal areas are excluded from the lighting zone requirements: 1. Media and arts production spaces. 2. Sports facilities (exercise spaces only, including hydrotherapy and physiotherapy areas).
Auditoria spaces	Areas used for teaching, seminar or lecture purposes have lighting controls specified in accordance with the size and use of the space, but a typical auditorium or lecture theatre with stepped seating and a formal lectern / demonstration / performance area would typically be expected to have lighting controls as follows: 1. Full normal lighting (to allow for entry and exit, cleaning etc.). 2. Demonstration area lighting off and audience area lighting reduced to a low level (for the purpose of line slide projection, but allowing enough light for the audience to take notes). 3. All lighting off (for the projection of tone slides, colour slides, and for the purposes of visual demonstrations or performances). 4. Separate localised lectern lighting.

One exemplary credit – Lighting control

7 Lighting in each control zone within an occupied space can be manually dimmed by occupants down to 20% or less of the maximum light output using lighting control interfaces positioned in accessible locations.

8 Lighting in each control zone within an occupied space can be colour tuned over a correlated colour temperature range from 2700K or less to 4000K or more, with automatic controls set to limit the correlated colour temperature in the afternoon and evening to 2700K or less.

9 All lighting should be designed to minimise flicker across their full dimming and colour tuning ranges (see M3.1).

Methodology

M1: Flicker and stroboscopic effects

All lighting (except for non-maintained emergency lighting), including light sources and separate control gear, must demonstrate compliance against one of the below:

1. Flicker and stroboscopic effects at full load (not dimmed) in line with Table 17, see M1.1 and M1.2

   Table 17: Flicker and stroboscopic effect limits

Location	Short-term flicker indicator (P_{st}^{LM})	Stroboscopic visibility measure (SVM)
EU and UK	≤ 1.0	≤ 0.4
All countries outside of EU and UK	≤ 1.0	≤ 1.0

2. IEEE 1789-2015 *IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers*

3. California Title 24, Joint Appendix JA10, Test Method for Measuring Flicker of Lighting Systems

Standards deemed equivalent by the project team can be submitted as per the Approved Standards process.

M1.1: European Union and UK – compliance

The following regulations are applicable in the EU and UK respectively:

- EU 2019/2020 (Single Light Regulation) and Ecodesign EU Directive 2009/125/EC
- UK SI 2010 No.2617 Ecodesign for Energy-Related Products Regulations

They mandate that lighting products must meet the flicker specification in Table 17 at full load (not dimmed) before they can be legally sold in the market.

For refurbishment and fit out projects, compliance must be demonstrated for all relevant lighting, even if projects are within the EU and UK.

M1.2: Locations outside of EU and UK – compliance

For the purpose of the BREEAM certification outside the EU and UK the original SVM value at ≤ 1.0 can be considered, in line with Table 17, unless there is a stricter requirement in a relevant national standard. Relevant test methods include but are not exclusive too:

- Short-term flicker indicator (P_{st}^{LM}): IEC TR 61547-1:2020
- Stroboscopic effects (SVM): IEC TR 63158:2018

M2: Internal lighting

M2.1: Occupancy or workstation layout

The limit of four workspaces is indicative of the required standard but is not a fixed requirement. Where there is justification for this to be increased to fit with the adopted lighting strategy, this may be accepted provided that the assessor is satisfied that the aim of this criterion is upheld, i.e. that there is suitable zoning or control of lighting to enable a reasonable degree of occupant control over lighting in their personal work area. The relevant design team member, e.g. lighting consultant, should set out how this is to be achieved in such an instance.

Where occupancy or workstation layout is not known, lighting control can be zoned based on 40 m² grids, i.e. an assumption of 1 person or workspace per 10 m².

M3: Lighting control

M3.1: Flicker in dimming and colour tuning ranges

In criterion 9, flicker must be demonstrated to have been met across the dimming and colour tuning ranges. To meet this, the performance criteria set out below in Table 18 must be demonstrated by one of the following approaches:

1. In-situ testing, including a mock up test – This must include product testing of the lighting system, including the combination of driver and light sources.
2. Lab testing – This must include product testing of the lighting system, including the combination of driver and light sources.
3. Driver data sheets – These must confirm the dimming range, the flicker performance across the entire operating window (dimming range), and confirmation that products are installed in line with the manufacturer recommendations.

Table 18: Performance criteria for flicker in dimmed and colour tuned states

Item	Description
Dimming range	50% light output and minimum specified dimming level (light output), or as specified within an alternate standard in M1.
Colour range	The above dimming range in each addressable channel must be assessed.
Performance requirement	Any flicker metric (i.e. P_{st}^{LM} or percentage flicker) and level of performance matching requirements in a standard listed in M1.
Note: The standards listed in M1 do not meet all the requirements for this criterion as they do not cover colour changes. In addition, only the California Title 24, Joint Appendix JA10 and IEEE 1789-2015 set performance requirements on flicker in dimming ranges.	

Compliance notes

Ref	Terms	Description
Flicker and stroboscopic effects		
CN1	National best practice standards	National or local equivalent for the flicker criteria can be used; however, this must be approved by BRE Global. The Approved Standards list can be used to propose a new standard.
Internal lighting		
CN2	National best practice lighting guides	Please refer to Approved Standards to locate the appropriate national best practice standards in the country of assessment. Alternatively, standards deemed equivalent by the project team can be submitted as per the process outlined in the Assessor Operations manual. Where appropriate lighting guides do not exist for a country, the design team should demonstrate compliance with the European standards: — EN 12464-1 Light and lighting – Lighting of workspaces (current version dated 2021)
CN2.1	Lighting levels for areas where computer screens are regularly used	Projects can specify 300 lux instead of what is prescribed in EN 12464-1. This is as per CIBSE Lighting Guide 7[(5)].
CN2.2	Limiting the potential of glare (criterion 3)	CIBSE Lighting Guide 7 – Sections 2.5, 2.15 to 2.17, 2.22, and 6.10 to 6.20 can be followed to demonstrate compliance against criterion 3.
Zoning and control		
CN3	Small spaces	Buildings consisting entirely of small rooms or spaces (less than 40 m²) which do not require any subdivision of lighting zones or control will meet the zoning criteria by default.
CN3.1	Zoning rooms not listed	For zoning rooms or spaces not listed within criteria 4 and 6, the assessor can exercise an element of judgment when determining whether what is specified is appropriate for the space, given its end use and the aim and criteria of this BREEAM issue.
CN3.2	Task lighting	Lighting zoning criteria are applicable to both general lighting and task lighting (where present). Task lighting is only considered in fully fitted projects, where they are integrated into the workstations. And can be controlled individually by occupants, and can be centrally controlled by building management, enabling automatic switch off. Portable task lights are not accepted. Task lighting must connect to the building systems in a way that prevents removal by general users.
CN3.3	Dimming control	Localised dimming controls installed in line with the criteria, along with a master on/off switch, can be considered as meeting the aim of the requirement for 'controls' in open plan offices.
CN3.4	Handheld remote controls	Remote control light switches can be considered as compliant, on the basis that these are provided in sufficient numbers/locations to meet the aim of the criteria.
CN3.5	Exemplary lighting control exemptions	The exemplary level criteria apply only to lighting zones in the asset where: — Zones will benefit from dimming or colour tuning control. — Dimming or colour tuning does not interfere with the function of the space. Where lighting zones do not have dimming or colour tuning controls fitted, these must be clearly evidenced and justified.
CN3.6	PIR in circulation spaces	PIR controls can be deemed compliant in circulation spaces such as corridors. In this instance 'separate occupant controls' are not required. The requirement for user control is so that the building users can have direct control over their immediate work environment to ensure it is suitable for their personal needs. In circulation spaces, occupancy is transient and PIR control in these spaces is acceptable.
CN3.7	Historic buildings	In some cases, an explicit requirement from the relevant conservation authority (e.g.

Ref	Terms	Description
		local authority conservation officer) may require the retention of existing listed lighting features which prevents zoning of lighting in accordance with criterion 4. In such cases, evidence should be provided from the conservation officer, and measures should be considered to ensure that adequate control is provided for existing retained lighting zones and measures adopted for the provision of task lighting as relevant for the function type and as is feasible within the constraints as applied by the conservation officer.

Evidence

Criteria	Interim design stage	Final post-construction stage
Flicker and stroboscopic effects		
1	Design drawings or lighting schedules. OR Relevant section or clauses of the building specification or contract. OR A letter of formal confirmation of compliance from the building services engineer or lighting designer. Where luminaire specifications are known, manufacturer's product data sheets.	Assessor site inspection report and photographic evidence. Final construction or equivalent lighting schedules and lighting layout plans. Manufacturer's product data sheets.
Internal lighting, Zoning and occupant control, Lighting control		
2–9	Design drawings, lighting schedules and lighting control strategy. OR Relevant section or clauses of the building specification or contract. OR A letter of formal confirmation of compliance from the building services engineer or lighting designer.	Assessor site inspection report and photographic evidence. Documentary evidence to confirm compliance such as final construction or equivalent lighting schedules, lighting layout plans, lighting control strategy, lighting calculations or light testing results. A letter of formal confirmation of compliance from the building services engineer or lighting designer. Where relevant, formal confirmation that flicker requirements are met across dimming and colour tuning ranges, through in-situ testing, lab testing, or driver data sheets.

Definitions

Computer simulation

Software tools that can be used to model more complex room geometries for daylighting.

Construction zone

For the purpose of this BREEAM issue, the construction zone is defined as the site which is being developed for the BREEAM-assessed building, and the external site areas that fall within the scope of the new works.

Illuminance

The amount of light falling on a surface per unit area, measured in lux.

Occupied space

A room or space within the assessed building that is likely to be continuously occupied for 30 minutes or more by a building user.

Reflectance

The ratio of the luminous flux reflected from a surface to the luminous flux incident on it.

Relevant building area – Internal lighting

Relevant areas for internal lighting should cover all the relevant areas listed within the standard used, i.e. EN 12464-1:2021 (Table 9 – 61).

Separate zoning – Occupant control

Light switches or controls for a particular area or zone of the building that can be accessed and operated by the individuals occupying that area or zone. Such controls will be located within, or within the vicinity of, the zone or area they control.

The relevant areas for the criteria apply only to areas where users are expected to have control. For instance, this means that areas intended for the general public, or a shop floor would not be expected to have lighting controls.

Uniformity

The uniformity is the ratio between the minimum illuminance on the working plane within a room and the average illuminance on the same working plane.

Working plane

CIBSE SLL Lighting Handbook and the CIBSE SLL Code for Lighting define the working plane or the reference plane as the plane at which work is normally done.

Additional information

Flicker and stroboscopic effects

Further information on flicker and stroboscopic effects can be found in SLL Factfile 17: Temporal lighting artefacts (2021).

Internal lighting levels, zoning and control

Relevant industry standards for lighting design

For preschools and schools, the following can be considered a relevant industry standard for lighting design:

— Building Bulletin 90: Lighting Design for Schools(6)

For care homes housing people with dementia the following standard can be used instead of the SLL Code for Lighting:

— Design Lighting for People with Dementia, University of Stirling, Stirling, 2013.

For residential institution (long-term stay), CIBSE SLL LG9(7) can be considered as a relevant standard in addition to, or instead of, SLL Code for Lighting 2022.

Illuminance levels specified in the SLL Code for Lighting 2022 align with BS EN 12464-1.(8)

BREEAM has not attempted to list all appropriate industry standards. Any recognised collaborative industry or sector best practice standard or guidance that sets levels appropriate to the tasks undertaken, accounting for building user concentration and comfort levels, can be considered an appropriate industry standard for the purposes of this BREEAM issue.

Hea 03 Non-visual effects of light

(all buildings)

Aim

To ensure the non-visual effects of light are considered to promote positive impacts on psychology and physiology of the building occupants through a healthy circadian rhythm.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All (see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Internal lighting** Where no material changes are being made to the internal lighting due to the scope of fit out works. The non-visual effects of light credit can be filtered out.

Building type specific notes

Ref	Building type specific note
2.0	**Preschool, Primary school and other asset types designed for young children** In accordance with CN1.1 where young children will occupy relevant building areas, the daytime level of 250 lux melanopic EDI must be achieved from daylight alone.

Assessment criteria

One credit – Non-visual effects of light

1 Achieve at least one credit for 'Daylighting' in Hea 01 Natural light.

2 All relevant areas achieve one of the below, as applicable:

2.a Where occupant positions are known and fixed (see M1.1): All positions in all relevant building areas receive a vertical illuminance of at least 250 lux melanopic EDI at occupant eyes for at least four hours during the daytime (beginning by noon at the latest).

2.b Where occupant positions are unknown or variable (see M1.2): Cylindrical illuminance at eye height across each relevant building area corresponds to at least 250 lux melanopic EDI for at least four hours during the daytime (beginning by noon at the latest).

3 Electric lighting systems and controls are in place to adjust the flux and spectral output of the emitted light over time (colour tuning) so that melanopic EDI at occupant eye level can be reduced in the afternoon and evening, as relevant for each type of application.

Residential areas (Healthcare, Residential institutions, Prisons, and Hospitality)

4 For residential areas within a building, systems and controls are in place to ensure that no more than 10 lux melanopic EDI for a period of three hours before bedtime and no more than 1 lux melanopic EDI during sleep time are achieved at occupant eye level in all relevant building areas where residential occupancy type is expected (see Definitions).

Methodology

M1: Non-visual effects of light

Non-visual effects of light can be quantified through melanopic Equivalent Daylight Illuminance (EDI), expressed in lux. This is the illuminance from daylight that produces a melanopic irradiance, or a circadian stimulation, equivalent to that of the light source considered. It can be calculated or measured based on illuminance and spectral power density using the CIE S 026 Toolbox (cie.co.at/publications/cie-system-metrology-optical-radiation-iprgc-influenced-responses-light-0).

For each seated or standing occupant location in all relevant building areas, daylight should be the preferred light source for achieving the 250 lux melanopic EDI criterion during the daytime (criterion 2). To calculate the daylight contribution, see M1.3. In addition to daylight, electric lighting may also be used to achieve the criterion. For appropriate methodology on electrical lighting contribution, see M1.4.

M1.1: Known and fixed occupant positions

Where fixed seated or standing positions are known, and criterion 2.a is used, only those positions and viewing directions need to be assessed for compliance against the daylight and electrical light contribution (M1.3 and M1.4) using vertical illuminance at the eye.

M1.2: Variable or not known positions

Where positions are variable or not known, and criterion 2.b is used, cylindrical illuminance at eye height, seated and/or standing (see CN1.4), must be determined in each relevant building area. A calculation grid as defined in Guidance Note 50 must be used for each relevant area. The daylight and electric lighting contributions should be determined at all calculation grid points in the relevant areas. To comply with criterion 2.b, cylindrical illuminance must meet the target at each calculation grid point.

Examples of spaces with variable occupant positions include areas where occupants are not confined to static locations during activities. These can be healthcare facilities where staff move around patients, retail spaces where shopping assistants move about, industrial buildings where staff shift between different positions, and other similar environments.

M1.3: Daylight contribution

Following the procedures described in Guidance Note 50, daylight contribution should first be determined through computer-based calculations of daylight illuminance (expressed in lux) at occupant eye level (see CN1.4). This can be vertical illuminance at the eye for each occupant position where occupant positions are fixed and known, or cylindrical illuminance at eye height across a calculation grid covering each relevant area where occupant positions are unknown or variable.

Calculations must be carried out for each occupied day in a typical year, and at hourly steps over four hours during the daytime beginning by noon at the latest. For each calculation point, the lowest hourly daylight illuminance value calculated (expressed in lux) should be retained and deducted from the target value of 250 lux melanopic EDI. If the result is a positive value, it should be taken as the daytime melanopic EDI target for the electric lighting system.

> For example, the lowest hourly daylight illuminance calculated at occupant eye level for a known and fixed seating location is 50 lux. In order to achieve the 250 lux melanopic EDI target, 200 lux melanopic EDI must be provided by electric lighting at occupant eye level for this location.

Note: Daylight illuminance (lux) is directly equivalent to melanopic EDI.[9]

M1.4: Electric lighting contribution

The contribution from electric lighting can be determined through in situ measurements or computer-based calculations of vertical melanopic EDI at eye level for each seating location where occupant positions are fixed and known, or cylindrical melanopic EDI at eye height across a grid covering each relevant area where occupant positions are unknown or variable.

Measurements should prioritise melanopic EDI via spectral power density (using a spectrometer) although illuminance (using an illuminance meter) would also be acceptable see M1.4.1 and M1.4.2 respectively. Computer-based calculations will typically include illuminance.

Daylight must be completely excluded from measurements and calculations of electric lighting (spectral power density and/or illuminance).

M1.4.1: Measurement of melanopic EDI

Vertical melanopic EDI can be measured in situ using a spectrometer that records spectral power density and converts the readings into melanopic EDI. Alternatively, if the spectrometer only records spectral power density without converting it into melanopic EDI, the spectral power density measurement results will need to be entered into the CIE S 026 Toolbox to determine the corresponding melanopic EDI values. The International Commission on Illumination (CIE) provides user guides and introduction videos in this respect (available from: cie.co.at/publications/cie-system-metrology-optical-radiation-iprgc-influenced-responses-light-0).

Where in situ measurements of cylindrical melanopic EDI are taken, a simplified methodology may be used. For each grid point, vertical melanopic EDI can be measured as above in all four cardinal directions corresponding to the main axes of the space, and the mean average of the four measurement results can be taken to represent cylindrical melanopic EDI.

M1.4.2: Measurement of illuminance

Where melanopic EDI or spectral power density measurements are not possible, illuminance can be measured or calculated via computer modelling. The illuminance measurement results will need to be multiplied by the melanopic Daylight Efficacy Ratio (DER) corresponding to the type of electric lighting used in each relevant building area. In this situation, the calculation cannot use the CIE S 026 Toolbox but instead should apply the melanopic DER given in Table 19 below for the corresponding type of electric lighting. The multiplication results will constitute the melanopic EDI values for electric lighting.

Table 19: Typical melanopic DER for common types of electric lighting

Type of electric lighting	Typical melanopic DER
LED, warm white, CCT 2700K	0.42
LED, warm white, CCT 3000K	0.47
LED, neutral white, CCT 4100K	0.63
LED, cool white, CCT 5700K	0.72
Fluorescent lighting, warm white, CCT 3000K	0.40
Fluorescent lighting, neutral white, CCT 4000K	0.56
Fluorescent lighting, cool white, CCT 5000K	0.68
Incandescent lighting	0.50

Notes:

1. The correlated colour temperature (CCT) should be as per product datasheets or measured in situ using a spectrometer.
2. Where the measured CCT differs from the values listed above, the melanopic DER corresponding to the nearest CCT listed may be used. Alternatively, for higher accuracy, the melanopic DER may be determined through interpolation or extrapolation.
3. If there are other types of electric lighting not listed above, the CCT value should be determined and the corresponding values for fluorescent lighting should be used.

Following on the example, where the lowest hourly daylight contribution at occupant eye level for a known and fixed seating location is 50 lux, 200 lux melanopic EDI of electric lighting is needed to meet criterion 2.a. The room assessed uses 'LED, neutral white, CCT 4100K' which has a melanopic DER of 0.63 (see Table 19 above). The measured illuminance at occupant eye level from electric lighting at the seating location is 500 lux. Therefore, the following can be confirmed:

The melanopic EDI from the electric lighting system = 500 × 0.63 = 315 (lux melanopic EDI)

The overall melanopic EDI for the seating location at occupant eye level = 50 + 315 = 365 (lux melanopic EDI)

This is greater than the 250 lux melanopic EDI and therefore this seating location meets criterion 2.a.

This process will need to be repeated for all other known and fixed seating locations in the relevant building area.

The same lighting system must also be able to meet criterion 3 and 4. In the case of a residential institution asset type, the electric lighting system must not exceed the melanopic EDI benchmarks provided for three hours before bedtime and during

sleep, respectively. The contribution from all forms of electric lighting present in each relevant building area should be accounted for.

> For example, the lighting is dimmed and colour tuned to a 'LED, warm white, CCT 2700K' which has a melanopic DER of 0.42 (see Table 19 on the previous page) three hours before bedtime in a residential care home. The measured illuminance at occupant eye level is 50 lux.
>
> The melanopic EDI from the electric lighting system = 50 × 0.42 = 21 (lux melanopic EDI)
>
> This is higher than the 10 lux melanopic EDI. To meet the criteria, the lighting system would have to reduce the CCT or dimmed further to reduce the illuminance at occupant eye level.

Compliance notes

Ref	Terms	Description
CN1	Relevant building areas – occupation hours	Criterion 2 should only be considered for occupation during daylight hours. Where the relevant building areas are occupied during nighttime hours only this criterion is not applicable. The remaining criteria are still applicable.
CN1.1	Occupant age	Criteria 1–4 are designed for a typical healthy adult. Currently, there is not enough evidence to justify changing the melanopic EDI criteria to suit other age groups. Where young children will occupy relevant building areas, the daytime level of 250 lux melanopic EDI must be achieved from daylight alone. There is no change in criteria for older adults.
CN1.2	Bedtime and sleep time – timeframes	Assessor and design team judgement can be used when defining the bed and sleep time frames. Where needed a bedtime of 23:00 and a sleep time of 7 hours can be assumed.
CN1.3	Areas exempt	Following the principles outlined in Section 5.3.5 of ISO/CIE 8995-1:2025, a band near the wall may be excluded unless occupants are expected to be in this zone for a significant amount of time (i.e. > 2 hours a day).[10]
CN1.4	Eye height	Eye height is considered to be 1.2 m above floor level for seated positions and 1.6 m when standing. Where fixed positions are unknown, both seated and standing eye heights must be assessed.
CN1.5	Exclusion of non-relevant areas	Only relevant areas within rooms should be assessed. However, spaces such as circulation routes or other transient spaces within a relevant area can only be excluded if the route or area is clearly defined by the building layout. Features of the building layout which may be considered as dictating a function area would include, for example, the position of doors or fixed furniture such as a reception desk or canteen servery.

Evidence

Criteria	Interim design stage	Final post-construction stage
Non-visual effects of light		
All	A letter of formal confirmation of compliance from the building services engineer or lighting designer. Lighting product datasheets and schedules or specification. Documentary evidence to confirm the measured or calculated inputs of illuminance or spectral power density. AND The calculated lux melanopic EDI confirming criteria has been achieved.	Assessor site inspection report and photographic evidence. Final construction drawings or equivalent, lighting product data sheets and schedules. Updated calculation or measurement inputs and results, where required. Formal confirmation of compliance from the building services engineer or lighting designer.

Definitions

Computer simulation

Software tools that can be used to model more complex room geometries for daylighting and electric lighting.

Cylindrical illuminance

Average illuminance on the curved surface of a small imaginary cylinder with a vertical axis, unless stated otherwise. It does not include light falling onto the ends of the cylinder. It can be calculated using specialist software.

Illuminance

The amount of light falling on a surface per unit area, measured in lux.

Melanopic Daylight Efficacy Ratio (DER)

Metric used to quantify the effectiveness of a light source in stimulating the melanopic photoreceptors in the human eye, relative to its ability to provide visible light for general vision. It is defined as the ratio of melanopic irradiances for this light source to that for the CIE standard daylight illuminant D65 at the same visual illuminance.(11)

Melanopic Equivalent Daylight Illuminance (EDI)

The illuminance from the CIE standard daylight illuminant D65 that produces an equal melanopic irradiance as the light source considered. Measured in lux.

Non-visual effects

Non-visual effects of light, also referred to as non-image-forming (NIF) or non-visual (NV) responses to light, are the physiological effects of light that are distinct from visual perception. These effects can include light-induced melatonin suppression; pupillary light reflex; circadian rhythm regulation; influence on heart rate and alertness; or impacts on mood and attention.

Occupied space

A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user.

Relevant areas – Non-visual effects

BREEAM defines relevant areas for non-visual effects to include areas of the building where:

1. There are or will be workstations, benches or desks for building users.
2. Close work will be undertaken.
3. Where occupants are expected to be for over 2 hours of the day and move about a space. Such as healthcare facilities where staff move around patients, retail spaces where shopping assistants move about, industrial buildings where staff shift between different positions, and other similar environments.

Exclusions apply to the following:

- Only the relevant areas listed above within a room need to comply, un-occupied areas in the same room such as corridors or storage areas are excluded (see CN1.5).
- See CN1.3
- The following areas exempt from the daylight criteria can be excluded (where present):
    - Media, arts production, SEN sensory spaces, x-ray rooms and other areas requiring strictly controlled acoustic or lighting conditions.

Residential areas

Residential areas within a building include any room intended for long term residential use, including sleep and long-term occupation.

Spectral power density

A measure of the power per unit area emitted by a light source per unit wavelength. It describes how the light emitted by a light source is distributed across different wavelengths of the visible spectrum. Typically measured in watts per square metre per nanometre (W/m²/nm).

Additional information

CIE S 026 Toolbox

The International Commission on Illumination provides user guides and introduction videos to support the use of the recommended CIE S 026 Toolbox (cie.co.at/publications/cie-system-metrology-optical-radiation-iprgc-influenced-responses-light-0).

Circadian lighting effects on health and wellbeing

Report on circadian lighting effects on health and wellbeing RI01: Circadian lighting (www.cibse.org/knowledge-research/knowledge-portal/research-insight-01-circadian-lighting).

Flicker in dimmable lighting

Flicker is of particular concern for lighting in dimmed states, such as required in criterion 4. Lighting designers should consider using the exemplary 'lighting control' criteria in Hea 02 Electric light to ensure that flicker does not negatively impact the building occupants and the overall lighting strategy.

Hea 04 Indoor air quality

(all buildings)

Aim

To recognise and encourage a healthy internal environment with excellent indoor air quality.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 6 + 3 exemplary	Pass, Very Good	All

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Ventilation** Where there are no changes to the ventilation systems, pathways, or filtration systems as part of the fit out, the respective criteria (3 to 5) can be filtered out of the assessment.

Building type specific notes

Ref	Building type specific note
2.0	**Industrial buildings** If the building will not contain any office or other occupied space, only the prerequisite within this issue applies. While the requirements apply to permanently or semi-permanently occupied offices, small administration areas, which are only used occasionally can be excluded.
2.1	**Industrial buildings** The aim of this issue is to encourage a healthy internal environment. For the operational areas of industrial buildings, the internal environment is dictated by health and safety requirements. This means that the BREEAM requirements should not be made applicable to them, and so the operational areas can be excluded in the assessment of Hea 04.

Assessment criteria

Prerequisite – No asbestos

1 In countries or jurisdictions where the use of asbestos in construction materials is not prohibited by law, the project demonstrates that no materials containing asbestos have been specified or installed as part of the refurbishment works.

One credit – Indoor air quality plan

2 A site-specific indoor air quality plan has been produced by a suitable IAQ professional and in accordance with Guidance Note 6 (GN06). This plan informs the design, specification, and installation to maximise improvement of indoor air quality during occupation. The plan must consider the following:

- 2.a Removal of highly contaminating sources.
- 2.b Dilution and control of other contaminant sources, including:
  - 2.b.i Air quality requirements of specialist areas such as laboratories, where present.
- 2.c Procedures for pre-occupancy flush out and purge ventilation.

2.d Third party testing and analysis.

2.e Maintaining indoor air quality in-use.

2.f Any relevant local or national authority plans or policies (for example, Air Quality Management Areas or Local Air Quality Action Plans).

2.g Protection of heating, ventilation and air-conditioning (HVAC) systems from sources of pollution during construction, refurbishment, or fit-out works, e.g. dust and debris.

2.h Measures to protect the indoor air quality of adjacent areas outside the immediate refurbishment or fit-out zone that may be affected by the works.

One credit – Ventilation

Refurbishment and fit-out works include measures to minimise the concentration and recirculation of pollutants in the building as follows:

3 Provide fresh air into the building in accordance with one of the best practice standards for ventilation listed below (for further guidance, see M1.1):

3.a ISO 17772-1:2017 Annex I

3.b EN 16798-1:2019 Annex B.3

3.c The national best practice standard for ventilation

4 Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building (see M1.3).

5 Where present, HVAC systems must incorporate suitable filtration to reduce infiltration of outdoor air pollutants into the indoor environment, as defined in EN 16798-3:2025 Section B.4.2.[12] The specified filters should achieve supply air classification of at least SUP 2. The level of filtration required is dependent on the quality of the outdoor air.

5.a Multiple-occupancy residential developments with ventilation or central air conditioning systems can demonstrate compliance with filter class of F7 or ePM_1 50%.

6 Occupied spaces have calibrated carbon dioxide (CO_2) or calibrated air quality sensors in specified areas, in line with M1.4 and:

6.a In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space.

6.b In naturally ventilated buildings or spaces: sensors either have the ability to alert the building owner, manager or occupants when CO_2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents.

6.c The total number of sensors, and the net internal area of relevant areas covered by the sensors, is reported via the BREEAM Platform.

Up to two credits – Emissions from construction products

One credit

7 Three of the five product types meet the emission limits, testing requirements and any additional requirements listed in Table 21 and M2. Where wood-based products are not one of three selected product types, all wood-based products used for internal fixtures and fittings must be tested and classified as formaldehyde E1 class as a minimum (see CN2.2).

> Even if low emitting products are used, the air quality may still exceed the indoor air quality limits, depending on the amount of material used, the volume of the space, and the ventilation rate.

Two credits

8 All the product types meet the emission limits, testing requirements and any additional requirements listed in Table 21 and M2.

Up to two credits – Post-construction indoor air quality measurement

One credit

9 Criterion 2 has been achieved.

10 Post-construction indoor air quality measurement is carried out for the parameters listed in Table 20 by a suitable IAQ professional.

11 Sampling and analysis for each parameter is performed in accordance with the test method specified in Table 20 and M3.

12 If any measured concentration level exceeds the limits in Table 20, the project team confirms the measures that have or will be undertaken in accordance with the recommendations of the IAQ plan to reduce the levels to within the limits.

Two credits

13 Criteria 9-11 has been achieved.

14 The measured concentration for each parameter listed in Table 20 does not exceed the 'Concentration limit' specified and the measured values are reported via the BREEAM Platform.

Table 20: Post-construction indoor air quality performance criteria

IAQ parameter	Concentration limit (µg/m³)	Sampling & analysis test method
Formaldehyde	100	ISO 16000-2[13] , ISO 16000-3[14]
TVOC	300	ISO 16000-5[15] , ISO 16000-6[16] , ISO 16017-1[17]

Up to two exemplary credits – Emissions from construction products

One exemplary credit

15 At least four of the five product types listed in Table 22 on page 101 meet the emission limits, testing requirements and any additional requirements listed in Table 22 and M2.

Two exemplary credits

16 All product types meet the emission limits, testing requirements and any additional requirements listed in Table 22 and M2.

One exemplary credit – Emissions from furniture products

17 80% of in-scope furniture products by cost or number of units meet the maximum allowable concentration limits for VOC emissions in one of the following (see M4):

17.a ANSI/BIFMA e3 Furniture Sustainability Standard, Section 7.6.1 or 7.6.2.[18]

17.b California Department of Public Health (CDPH) Standard Method v1.2-2017, Table 4-1.

Checklists and tables

Table 21: Emission criteria by product type

Emission limit [1, 2]			Testing requirement
Formaldehyde	Total volatile organic compounds (TVOC) [3]	Category 1A and 1B carcinogens	
Interior paints and coatings			
≤ 0.06 mg/m³	≤ 1.0 mg/m³	≤ 0.001 mg/m³	EN 16402 [19] or ISO 16000-9 [20] or BS EN 16516[21] or

Emission limit [1, 2]			Testing requirement
Formaldehyde	Total volatile organic compounds (TVOC) [3]	Category 1A and 1B carcinogens	
			CDPH Standard Method v1.2 [22] or ISO 16000-10 [23] (see CN2.5)
Additional requirements for interior paints and coatings (see M2.3)			
Meet VOC content limits (Table 23 on page 104). Paints used in wet areas (e.g. bathrooms, kitchens, utility rooms) should protect against mould growth (see M2.3).			
Wood-based products (including wood flooring)			
≤ 0.06 mg/m³	≤ 1.0 mg/m³	≤ 0.001 mg/m³	ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or EN 717-1 (formaldehyde emissions only) [24] or ISO 16000-10 (see CN2.5)
Flooring materials (including floor levelling compounds and resin flooring)			
≤ 0.06 mg/m³	≤ 1.0 mg/m³	≤ 0.001 mg/m³	ISO 10580 [25] or ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)
Ceiling materials, wall materials, acoustic insulation and thermal insulation materials			
≤ 0.06 mg/m³	≤ 1.0 mg/m³	≤ 0.001 mg/m³	ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)
Interior adhesives and sealants (including flooring adhesives)			
≤ 0.06 mg/m³	≤ 1.0 mg/m³	≤ 0.001 mg/m³	EN 13999 (Parts 1-4) [26], [27], [28], [29] or ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)

Notes

1. Compliance with emission limits shall be demonstrated after 28 days in an emission test chamber or earlier as stipulated by the relevant testing requirements standard. The emission rate obtained from the chamber test method must be extrapolated to predict what the concentration would be in the air of the theoretical model or reference room (as detailed in the respective testing standard) and this extrapolated concentration compared with the emission limit in this table.
2. The emission limits in this table apply to the finished product, i.e. after any coating or other treatment process has been applied.
3. Where test results for a product exceed the TVOC emission limit, compliance with the above requirements can still be achieved where the test results demonstrate an R-value ≤ 1 after 28 days.

Table 22: Exemplary level emission criteria by product type

Emission limit [1, 2]				Testing requirement
Formaldehyde	Total volatile organic compounds (TVOC) [3]	Total semi-volatile organic compounds (TSVOC)	Category 1A and 1B carcinogens	
Interior paints and coatings				
≤ 0.01 mg/m³	≤ 0.3 mg/m³	≤ 0.1 mg/m³	≤ 0.001 mg/m³	EN 16402 or ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)
Additional requirements for interior paints and coatings (see M2.3)				
Meet VOC content limits (Table 23 on page 104). Paints used in wet areas (e.g. bathrooms, kitchens, utility rooms) should protect against mould growth (see M2.3).				
Wood-based products (including wood flooring)				
≤ 0.01 mg/m³	≤ 0.3 mg/m³	≤ 0.1 mg/m³	≤ 0.001 mg/m³	ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or EN 717-1 (formaldehyde emissions only) or ISO 16000-10 (see CN2.5)
Flooring materials (including floor levelling compounds and resin flooring)				
≤ 0.01 mg/m³	≤ 0.3 mg/m³	≤ 0.1 mg/m³	≤ 0.001 mg/m³	ISO 10580 or ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)
Ceiling materials, wall materials, acoustic insulation and thermal insulation materials				
≤ 0.01 mg/m³	≤ 0.3 mg/m³	≤ 0.1 mg/m³	≤ 0.001 mg/m³	ISO 16000-9 or BS EN 16516 or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)
Interior adhesives and sealants (including flooring adhesives)				
≤ 0.01 mg/m³	≤ 0.3 mg/m³	≤ 0.1 mg/m³	≤ 0.001 mg/m³	EN 13999 (Parts 1-4) or ISO 16000-9 or BS EN 16516

Emission limit [1, 2] Formaldehyde	Total volatile organic compounds (TVOC) [3]	Total semi-volatile organic compounds (TSVOC)	Category 1A and 1B carcinogens	Testing requirement
				or CDPH Standard Method v1.2 or ISO 16000-10 (see CN2.5)

Notes

1. Compliance with emission limits shall be demonstrated after 28 days in an emission test chamber or earlier as stipulated by the relevant testing requirements standard. The emission rate obtained from the chamber test method must be extrapolated to predict what the concentration would be in the air of the theoretical model or reference room (as detailed in the respective testing standard) and this extrapolated concentration compared with the emission limit in this table.
2. The emission limits in this table apply to the finished product, i.e. after any coating or other treatment process has been applied.
3. Where test results for a product exceed the TVOC emission limit, compliance with the above requirements can still be achieved where the test results demonstrate an R-value ≤ 1 after 28 days.

Methodology

M1: Ventilation

M1.1: Provision of fresh air for ventilation (all countries except UK)

It is the design team's responsibility to determine and apply the most appropriate method or option(s) for the project undergoing assessment. The appropriate calculation method, as outlined in either standard below must be used:

- ISO 17772-1:2017 Annex I or
- EN 16798-1:2019 Annex B.3

For both standards, either Category I or Category II (high to medium) Indoor environmental quality input values must be used.

Supply air for buildings subject to human occupancy shall consider the expected emissions from indoor sources and from the ventilation system itself to ensure that proper indoor air quality shall be achieved – as according to EN 16798-3:2025 Section 9.2.

Residential institution (long term stay) buildings

Both standards provide different options for selecting design ventilation rates:

- Total air change rate for the dwelling
- Extract air flows for specific rooms
- Supply air flows for specific rooms
- Design opening areas for natural ventilation

M1.2: Provision of fresh air for ventilation (UK only)

It is the design team's responsibility to determine and apply the most appropriate method or option(s) for the project undergoing assessment.

Education buildings

- Building Bulletin 101 or BS ISO 17772-1:2017 (excluding naturally ventilated buildings), whichever requires the higher performance.

Clinical areas with controlled environmental conditions

- HTM03-01 Specialised ventilation for healthcare premises (England, Wales and Northern Ireland), SHTM03-01 Ventilation for healthcare premises Part A: Design and Validation (Scotland).

  OR

- BS ISO 17772-1:2017 (excluding naturally ventilated buildings), whichever requires the higher performance.

All other buildings (mixed mode or mechanical ventilation)

— BS ISO 17772-1:2017 Annex I.

All other buildings (naturally ventilated)

— CIBSE AM10.

M1.3: Ventilation pathways

Location of ventilation intakes and airflows must be designed in accordance with the below methodologies. There are different methodologies for either mechanically ventilated and mixed mode buildings or naturally ventilated buildings.

Mechanically ventilated and mixed mode buildings

The design of air-conditioned and mixed mode buildings must minimise the build-up of air pollutants. Locations of ventilation intakes and airflow pathways should be designed in accordance with one or a combination of the following methods:

1. Locating the building's air intakes and exhausts, in relation to each other and sources of external pollution, in accordance with the following best practice as appropriate:
    a. PD CEN/TR 16798-4:2017 Sections 8.8.1 to 8.8.4
    b. BRE FB 30 Ventilation for healthy buildings: Reducing the impact of urban air pollution (2011)
    c. BRE IP 9/14 Locating ventilation inlets to reduce ingress of external pollutants into buildings, as appropriate
    d. CIBSE TM21
    e. ANSI/ASHRAE Standard 62.1:2025 Section 5.4 and Normative Appendix B
2. Pollutant dispersion modelling can be used to inform the location of the building's air intakes and exhausts in relation to each other and sources of external pollution. This can be achieved using either wind tunnel modelling or numerical modelling. Pollutant dispersion modelling in urban areas is complex, so it is important that the person carrying out the modelling is a competent individual (see Definitions).

Where significant levels of gaseous pollutants such as nitrogen dioxide are identified in the outdoor air, as in an Air Quality Management Area (AQMA), the use of appropriate gas phase filtration in the building ventilation system should be considered. Design teams must ensure that filter performance is appropriate for the pollutant conditions experienced at the site.

Naturally ventilated buildings

The design of naturally ventilated buildings must minimise the build-up of air pollutants. Ventilation intakes and airflow pathways should be designed using the guidance available in the following best practice documents:

— BRE FB 30 Ventilation for healthy buildings: Reducing the impact of urban air pollution (2011)

— BRE IP 9/14 Locating ventilation inlets to reduce ingress of external pollutants into buildings (2014), and

— CIBSE TM21 Minimising pollutants at air intakes (1999), as appropriate.

M1.4: Sensors

Sensors are recommended to be NDIR (Non-Dispersive Infrared) type, calibrated, mounted, and installed in line with the manufacturer's recommendations and in line with national guidance. The number of sensors should be decided based on the coverage of each sensor, according to the manufacturer.

For CO_2 monitoring used to gain ventilation credit, the sensors must be wall mounted. The CO_2 sensors should be placed at head height and away from windows, doors or air supply openings or the sensors must be installed in accordance with Building Regulations ADF2 for UK specific buildings.

M2: Emissions from construction products

M2.1: Scope of assessment of emissions from construction products

Only products that are installed or applied in parts of the building where their emissions are likely to affect indoor air quality need to be assessed. For the purposes of this issue, this means any product installed or applied:

— Inside of the inner surface of the building's infiltration.
— Inside of the vapour or waterproof membrane, or
— Inside of the inner surface of the building envelope's interior facing thermal insulation layer, where present.

The scope of the VOC credit issues covers products such as:

- Where a paint or coating falls within a category in Annex II of the EU Directive 2004/42/CE or, a category in the relevant product emission table of the technical manual, then the paint or coating must be assessed. This is likely to include paints and coatings applied to walls, ceilings, floors, doors, etc.
- A finish applied to a product in the factory. Any finished product as a whole must meet the performance requirements / emission limits set in the manual. For instance, a wood panel has a finish applied in the factory. The whole panel, including all the elements that make up that panel, would need to comply with the requirements set for wood panel products in this issue.
- Internal finishes to installations manufactured off-site such as elevators. The specification of internal finishes (regardless of whether they are installed on site or in the factory) will impact on VOC emissions.

M2.1.1: Non-VOC emitting products

Inherently non-VOC emitting products do not need to be assessed and can be deemed fully compliant with the criteria. Examples of non-VOC emitting products include:

- Brick
- Natural stone
- Concrete
- Ceramic tile
- Glass
- Metal surfaces etc.

This is unless potentially VOC emitting products (either organic- or inorganic-based) are used as coatings, binders, or sealants in their production or finishes.

M2.2: Guidance Note 22

Guidance Note 22 (GN22) provides a list of approved alternative schemes recognised by BREEAM and that can be used to demonstrate compliance for the VOC emission levels. If assessors, clients or scheme operators wish to seek recognition of other schemes not currently listed, please contact the BREEAM office (breeam@bregroup.com) for details of the application process.

M2.3: Additional requirements for interior paints and coatings

Evidence must be provided to show that paints used in wet areas protect against mould growth. Evidence could include appropriate test results (e.g. fungal or algal resistance testing) or manufacturer's product information or declaration. There are European standard tests which could be used: EN 15457 and EN 15458.[30], [31]

In addition to the emission criteria by product type in Table 21 on page 99 and Table 22 on page 101, interior paints and coatings must also comply with requirements shown in Table 23 below.

Table 23: Maximum VOC content for paints and coatings

Product category	Free VOC content of ready-to-use product (g/l)	Testing requirements
Interior matt walls and ceilings (Gloss <25@60°)	10	ISO 11890-2 or ISO 17895 or Calculation based on the ingredients and raw materials
Interior glossy walls and ceilings (Gloss >25@60°)	30	
Interior trim and cladding paints for wood and metal	60	
Interior trim varnishes and wood stains, including opaque wood stains	60	
Interior minimal build wood stains	40	
Primers	10	
Binding primers	10	
One-pack performance coatings	65	
Multi-pack reactive performance coating products	65	
Anti-corrosion coating products and primers	65	

M2.4: Self-declaration of emission levels from construction products

Manufacturers' self-declaration of emission levels from construction products is acceptable in the form of technical specification sheets or manufacturers' literature provided the testing has been performed by an accredited laboratory in accordance with the above. OR, where the manufacturer declares that the product contains no formaldehyde or VOCs.

For paints and varnishes, manufacturers' calculations of VOC content, based on the constituent ingredients, can be used to demonstrate compliance with the testing requirement.

M2.5: Testing requirements for emission limits

The testing requirements for emission limits are based on the use of standardised emission test chamber methods. Perforator, flask, desiccator and other extraction-based test methods are specifically excluded. Compliance with these requirements may be met using alternative standards, where these stipulate emission test chamber methods similar to those in the standards listed in Table 21 and Table 22. BREEAM Assessors must submit details of any alternative standards to BRE Global for approval prior to awarding any credits for this issue.

M2.6: M&E construction products

For M&E purposes, only paints, coatings, adhesives and sealants that are applied on site during construction and finishing works need to be included in the assessment. Prefabricated M&E components that arrive on-site as complete, factory-finished products are excluded from emission assessment requirements. HVAC insulation can be excluded from the emission assessment.

M3: Post-construction indoor air quality measurement

The information in this methodology section is provided to assist project teams and BREEAM Assessors on the appropriate scope of post-construction indoor air quality measurement, and, as such, is intended as guidance only. The sampling strategy should be determined based on the advice of the IAQ professional appointed to conduct the testing.

M3.1: Competence and strategy

All sampling and measurement activities shall be carried out by a suitable IAQ professional who has experience working in the field of indoor air quality investigation and measurement. The organisation conducting the assessment must possess sufficient expertise to determine the appropriate number and location of sampling points.

The sampling strategy should be developed through discussion between the organisation conducting the assessment and a representative of the project team. This strategic advice must be based on the typology of the building spaces, their intended use, and the ventilation strategy (e.g., natural, mechanical, hybrid) employed in the building.

A detailed description of the sampling strategy, including the rationale for the selected locations and number of samples, must be included in the final report.

M3.2: Pre-sampling building conditions

The building should be fully completed before testing, with all finishes and furniture in place if it is a finished building. Ideally, sampling should be conducted prior to occupancy. If this is not possible due to time constraints, all measurements must be completed within the first two weeks of occupancy. In such cases, sampling can be conducted during weekends or other periods of low occupancy, provided the building's HVAC system is operating under normal conditions and the spaces have been configured for typical use (e.g., furniture in place, doors closed as normal) for at least the 24-hour pre-sampling closure period.

For naturally ventilated rooms, windows and external doors are opened for about 15 minutes and then kept closed or in normal operating conditions for at least 8 hours before sampling.

For mechanically ventilated rooms, the HVAC should be running under normal operating conditions for at least 3 hours before and during testing. Internal layouts and doors are kept as in normal use, and no activities such as painting, sealing, or use of strong cleaning products should occur in the two days prior to sampling.

M3.3: Sampling location strategy

Sampling is carried out in representative occupied spaces where people spend more than 30 minutes at a time, such as offices, classrooms, conference rooms, or bedrooms.

The number of sampling locations should be determined based on the homogeneity of the spaces. For example, in an office building, sampling a single cellular office is typically sufficient to represent all cellular offices of the same construction, fit-out materials, and ventilation strategy.

Conversely, in larger or open-plan areas, multiple sampling locations are required to assess the homogeneity of the environment. A limited number of areas per typology are sufficient where interior finishes and ventilation are consistent, while larger or open-plan areas require more locations.

Samples are collected from the breathing zone (about 1–1.5 m above the floor and away from walls, windows, or supply air diffusers).

M3.4: Sampling duration

The sampling duration at each location shall be set by the IAQ professional in charge to achieve the required sampling volumes as prescribed by the standard methods (e.g., ISO 16000-6, ISO 16000-3); typical sampling times are often in the range of 30-60 minutes. This ensures the collected sample is sufficient for laboratory analysis and provides results above the method detection limits.

M4: Emissions from furniture products

M4.1: Scope for assessment of emissions from furniture products

This requirement applies to all newly installed, commercial furniture products provided as part of the project. This includes, but is not limited to, seating such as task chairs, side chairs, guest chairs, and stools; desks and tables such as height-adjustable desks, conference tables, and training tables; workstations and hang-on components; and storage units such as freestanding cabinets, bookcases, and mobile pedestals.

The following product types are excluded from the assessment scope:

- Residential-grade furniture, i.e., mattresses, curtains, photo frames, etc, and medical furniture products.
- Bespoke, built-in, or fixed furniture.
- Furniture that was manufactured and installed more than 12 months prior to the assessment.
- Furniture designed for outdoor use only.
- Furniture which are part of the building structure.
- Furniture made entirely of inherently non-VOC-emitting products (as described in M2.1.1).
- Furniture made entirely of reused materials.

M4.2: Methodology for furniture emissions testing

Verification of compliance must be based on laboratory testing conducted by an ISO/IEC 17025 accredited laboratory in accordance with ANSI/BIFMA M7.1[32] (or its most recent iteration) or the California Department of Public Health (CDPH) Standard Method v1.2-2017.

The appropriate standard emission scenario, as specified in the respective method (e.g., office or classroom scenario in CDPH, and the defined environment in BIFMA/ANSI), must be used for testing.

M4.3: Furniture emissions certification requirements

The product certificate or test report must explicitly state compliance with the VOC emission limits specified in Section 7.6.1 or 7.6.2 of the ANSI/BIFMA e3 Furniture Sustainability Standard OR with the VOC emission limits defined in Table 4-1 of the California Department of Public Health (CDPH) Standard Method v1.2-2017.

Compliance notes

Ref	Terms	Description
Ventilation		
CN1	Ventilation with window opening restrictors	Opening restrictors to windows may sometimes need to be installed to meet: — Health and safety requirements — Building regulations

Ref	Terms	Description
		— Legal obligations Where such external requirements are in force, these requirements cannot be used as a mitigating factor for meeting the BREEAM ventilation criteria. Even with window restrictors, adequate ventilation must still be demonstrated in accordance with the requirements.
CN1.1	Ventilation filter classification	Filters of class F7 and ePM_1 50% can be considered equivalent to those of class MERV 13.
CN1.2	Ventilation – filtration – single occupancy dwellings	For compliance with criterion 5, it is sufficient to demonstrate that a suitable filtration system is incorporated in the installed HVAC system, in accordance with the manufacturers' recommendations.
Emissions from construction and furniture products		
CN2	Products used in small quantities for ad hoc purposes	All products specified for a project that fall within one of the product types listed in Table 21 and Table 22 on page 101 must be assessed under this issue. However, it is accepted that it may be difficult to control the specification of some products (e.g. sealants) that are used in small quantities for ad hoc purposes such as 'making good'. As such, any products used in this way do not need to be assessed for this issue. The BREEAM Assessor should use their judgment to determine whether products being used or intended to be used for ad hoc purposes will be used in significant quantities and therefore need to be assessed for this issue.
CN2.1	Specialist products	Products specified for specialist applications or providing a specific function may be exempted from meeting the emission limits in Table 21 on page 99 and Table 22 on page 101 where it can be demonstrated that there are no alternative products available that can perform the function and meet the emission limits.
CN2.2	Formaldehyde E1 class	The formaldehyde E1 class is set by the European union commission in Regulation (EC) No 1907/2006. The minimum emission limit set for furniture and wood-based articles is ≤ 0.124 mg/m³. This is the current requirement. Note that new Regulation 2023/1464, published on 14 July 2023 comes into effect after 6 August 2026. The minimum emission limit set for furniture and wood-based articles is ≤ 0.062 mg/m³. All relevant products after the adoption date must comply with the new limit.
CN2.3	Number of products to comply when less than five product types are specified in the building – Non exemplary credits	For compliance with the first credit for emissions from constructions products, where four product types are specified within the building, the requirements remain the same and three out of the four must comply with the criteria for emissions from construction products. Where three or fewer product types are specified within the building, the number of product types that need to be assessed for the emissions criteria reduces proportionally as follows: — Where three product types are present, two must comply. — Where two or fewer product types are present, one must comply. For the second credit, all the products that are specified need to comply. For example, if only four product types were specified then all of these would need to comply to achieve the second credit.
CN2.4	Number of products to comply when less than five product types are specified in the building – Exemplary credits	For compliance with the first exemplary credit for emissions from constructions products, where four product types are specified within the building, the requirements remain the same and three out of the four must comply with the criteria for emissions from construction products. Where three or fewer product types are specified within the building, the number of product types that need to be assessed for the emissions criteria reduces proportionally as follows: — Where three product types are present, all must comply. Two exemplary credits are awarded if three out of three meet the requirement. — No exemplary credits are awarded if two out of three product types meet the

Ref	Terms	Description
		requirement.
CN2.5	Testing to ISO 16000-10	Results of testing to ISO 16000-10 can be considered compliant with the relevant testing requirements of the emissions from construction products credit where the product manufacturer can demonstrate the results generated by testing to ISO 16000-10 correlate to results that would be achieved using EN 16516 or ISO 16000-9.
CN2.6	Ceiling materials, wall materials, acoustic insulation and thermal insulation materials	This product category refers to all building materials specifically designed for use in ceilings, walls, or as insulation systems, which are not covered under other categories in Table 21. This includes, but is not limited to, materials such as acoustic ceiling tiles, gypsum boards, wall insulation panels, mineral wool, rigid foam insulation, cement-bonded particle boards, acoustic boards, and wall coverings of any type.
CN2.7	Paints and varnishes in historic buildings	An exemption is provided for historic buildings where there is an explicit requirement from the Local Authority conservation officer or the national conservation body to use specific paints and varnishes that may contain a high level of VOCs. In all cases procedures should be in place to ensure the building is flushed out for a sufficient period prior to occupation and ventilated adequately in order to reduce risks with VOCs in accordance with criteria 2 and 3.
CN2.8	Bespoke, built-in, or fixed furniture	Furniture excludes bespoke, built-in, or fixed furniture. Fixtures and fittings that are integral to the building — such as kitchen units and toilet cubicles — would be assessed under the VOC emission criteria for construction product types.
CN2.9	Validity of product emission certificates or test reports	The product emission certificates, or test reports, must be valid either at the time of specification or at the time of purchase.
CN2.10	Untreated solid wood – Formaldehyde E1 emissions requirements	Testing for formaldehyde is not required for untreated solid wood where no formaldehyde containing binders, resins, adhesives, coatings, or chemical treatments have been used in the processing or manufacture. In such cases, a formaldehyde emissions test report is not required. However, the assessor must obtain confirmation from the manufacturer/supplier that: — the product is solid, untreated timber — no formaldehyde has been used as described above
CN2.11	Reused and reclaimed products	Criteria 7–8 and 15–17 are intended to apply to newly manufactured construction products and materials. Where a construction product can be robustly identified as previously used and is re used or reclaimed, it may be considered as outside the scope of the emissions from construction products criteria. However, any new coatings, finishes, adhesives, sealants, or other chemical treatments applied for the product's installation must be considered and assessed separately, where relevant.
Emissions from construction and furniture products / post-construction indoor air quality measurement		
CN3	Accreditation of organisations performing analysis	All organisations conducting indoor air analysis or emissions testing of building products must be accredited to ISO/IEC 17025[33], with specific accreditation covering all applicable chemical analysis and emission testing methods relevant to their scope. The accreditation must be carried out by either: — A national accreditation body, e.g. UKAS. — An accreditation body that is a signatory to the ILAC Mutual Recognition Arrangement (ILAC MRA).
CN3.1	Accreditation of organisations performing laboratory analysis and testing of emissions	If sampling and analysis is carried out by two separate organisations, then the sampling organisation does not need to be accredited to the above (CN3). However, they must provide a brief report justifying: — The sampling methodology used. — Appropriate environmental conditions during the sampling. — The number and location of samples taken. This report is provided to the BREEAM assessor and submitted as supporting evidence for this issue.
CN3.2	Accreditation of	The independent third-party certification body must meet the following accreditation

Ref	Terms	Description
	product Certification bodies for Furniture emissions	requirements: — Be accredited to ISO/IEC 17065 for product certification. — Receive its accreditation from a national accreditation body (e.g. UKAS) or an accreditation body that is a signatory to the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA).

Evidence

Criteria	Interim design stage	Final post-construction stage
Prerequisite – No asbestos		
1	The relevant section or clauses of the building specification or contract or appropriate legislation.	A formal letter from the design team or principal contractor confirming no materials containing asbestos were used within the building in line with the relevant sections of the building specification, contract clauses or appropriate legislation.
Indoor air quality plan		
2	A copy of the indoor air quality plan.	Written confirmation including examples and any documentary supporting evidence to demonstrate how the indoor air quality plan was used to influence the design, specification and installation (measures relating to credits not targeted do not need to be implemented).
Ventilation		
3–6	Design drawings, relevant sections of the building specification or contract clauses.	Final construction drawings or equivalent and assessor site inspection report and photographic evidence. Confirmation sensors are calibrated and mounted in line with guidance. For a naturally ventilated building, a letter from the building services engineer confirming the building has been built in accordance with a design compliant with the BREEAM criteria. For a mechanically ventilated building, the commissioning manager's performance testing report confirming the required fresh air rates are achieved.
Emissions from construction and furniture products and exemplary level		
7–8, 15–17	Relevant sections of the building specification, contract clauses, schedule or letter of commitment confirming specification of compliant materials. Where product specification is known, letters from or copies of the manufacturer's literature confirming testing standards and emissions achieved.	Confirmation from the project team of the materials installed for each relevant product type. Letter from or copies of the manufacturer's literature confirming testing standards and emissions achieved. Where applicable for paints and varnishes, evidence of protection against mould growth.
Post-construction indoor air quality measurement		
9–14	Commitment to carry out necessary testing post-construction.	Indoor air quality assessment report showing results of indoor air quality testing for formaldehyde and TVOCs, by a suitable IAQ

Criteria	Interim design stage	Final post-construction stage
		professional. Where representative sampling is undertaken, the report must include details of the sampling strategy employed on site, including the rationale for selected locations, number of samples, and photographic evidence of sampling height. Where relevant, written confirmation from the project team of the remedial measures that have been undertaken.

Definitions

Category 1A and 1B carcinogens

Carcinogenic compounds detectable by the VOC emission testing requirements in Table 21 and Table 22 and that are classified as category 1A or 1B carcinogens in Annex VI to Regulation (EC) No. 1272/2008 on classification, labelling and packaging of substances and mixtures, which are listed as *Carcinogenic VOCs* in Annex H of EN 16516.[34], [35]

Competent individual – Wind tunnel modelling

An individual with one or more of the following qualifications and experience can be a 'competent individual' for the purpose of carrying out wind tunnel modelling:

1. Holds a degree or equivalent qualification in a relevant engineering field (mechanical, chemical), physics, mathematics, or meteorology, AND holds a membership to an appropriate professional body.
2. Has a minimum of three years relevant experience. Such experience must clearly demonstrate a practical understanding and experience of wind tunnel modelling and factors affecting outdoor pollutant dispersion in relation to ventilation and the built environment.

Competent individual – Numerical modelling

An individual with one or more of the following qualifications and experience can be a 'competent individual' for the purpose of carrying out numerical modelling:

1. Holds a degree or equivalent qualification in a relevant engineering field (mechanical, chemical), physics, mathematics, meteorology, environmental sciences, environmental engineering or a related environmental discipline, AND holds a membership to an appropriate professional body,
2. Demonstrated ability to interpret environmental guidelines, policies, plans and legislative requirements.

Fresh air

Fresh air is air used to supply air for buildings that ensures proper indoor air quality is achieved. This includes filtered outdoor air or air from a fresh supply.

Habitable or occupied room

A room used for dwelling purposes or a room in a non-dwelling occupied by people (e.g. office, hotel bedroom, classroom) but which is not used solely as a kitchen, bathroom, cellar, utility room or for storing plant or equipment.[36]

Occupied space – Ventilation

A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user.

The definition includes areas with a large and unpredictable or variable occupancy pattern, for example:

— Auditoria
— Gyms

- Retail stores, malls, or shopping centres
- Cinemas
- Waiting rooms

For the ventilation credit, the definition excludes:

1. Small spaces up to 125 m^3 volume, or up to 50 m^2 floor area.

Openable window area

The openable window area is defined as the geometric free ventilation area created when a ventilation opening, e.g. window, is open to its normal operational fully designed extent for ventilation purposes (i.e. this excludes open areas created when reversible windows are opened for cleaning etc.). It is not the glazed area of a façade or the glazed area of the part of the window that is openable (unless it opens fully).

Purge ventilation

Manually controlled ventilation of rooms or spaces at a relatively high rate to rapidly dilute pollutants and/or disperse water vapour. Purge ventilation may be provided by natural means (e.g. an openable window) or mechanical means (e.g. a fan).

R-value

Sum of all Ri values. Ri is the ratio Ci or LCIi, where Ci is the mass concentration of the individual VOC i. in the air of the reference room, and LCIi is the LCI value of VOC i. The LCI value is the 'Lowest Concentration of Interest', which is the substance-specific value for health-related evaluation of the emission from construction products as agreed by the EU-LCI Working Group (ec.europa.eu/growth/sectors/construction/eu-lci_en).

Sources of external pollution

This includes, but is not limited to the following:

1. Highways and the main access roads on the assessed site.
2. Car parks, delivery areas and vehicle waiting bays.
3. Other building exhausts, including from building services plant, industrial or agricultural processes.

Service and access roads with restricted and infrequent access (for example roads used only for waste collection) are unlikely to represent a significant source of external pollution. These roads can therefore be excluded from the criteria of this issue. This does not include vehicle pick-up or drop-off or waiting bays.

Suitable IAQ professional

An individual who has at least 3 years of experience working in the area of IAQ monitoring.

Total semi-volatile organic compound (TSVOC)

Sum of the concentrations of identified and unidentified volatile organic compounds eluting between n-hexadecane (excluded) and n-docosane (included) on a gas chromatographic column.

Total volatile organic compound (TVOC)

Sum of the concentrations of identified and unidentified volatile organic compounds eluting between and including n-hexane and n-hexadecane on a gas chromatographic column.

Additional information

None.

Hea 05 Thermal comfort

(all buildings)

Aim

To ensure the building can provide an appropriate level of thermal comfort.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2	None	All

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Thermal comfort – current climate, Thermal zoning and controls** Where no changes are being made to heating and/or cooling systems (crit 1–7) and/or zoning and controls systems (crit 8–9) as part of the fit-out, the relevant criteria can be filtered out of the assessment.

Building type specific notes

Ref	Building type specific note
2.0	**Industrial (without offices)** Where an industrial unit contains no office space and only an operational or storage area, this BREEAM issue does not apply.
2.1	**Industrial (with offices)** The thermal comfort criteria (criteria 1 to 7) do not apply to the operational or storage areas typically found in industrial assets or other similar asset types. The criteria still apply to the other parts of the asset as appropriate.
2.2	**Education** In this issue, occupant controls (criterion 9) are for staff use only.
2.3	**Buildings with less complex heating or cooling systems** Thermal modelling – An alternative, less complex analysis may be appropriate, compared to full dynamic building simulation (criterion 1). Thermal zoning and controls – The strategy need only comply with criteria 9.a and 9.b, see M2.2.
2.4	**Healthcare, Education and other** Alternative standards for Thermal modelling –current climate are outlined in M1.2.1 and M1.2.2 for UK Healthcare and Education buildings. Other alternative standards are allowed in line with CN1.4.

Assessment criteria

One credit – Thermal modelling – Current climate

1 Calculate thermal comfort in relevant occupied areas using full dynamic building simulation (see M1.2). Do this in accordance with an approved standard below taking full account of seasonal variations.

2 A competent person (e.g. accredited building services engineer) must assess the suitability of existing building services and controls to identify any changes that may be required as a result of fit-out works (e.g. as a result of changes to internal layout, occupant density, additional equipment that may increase cooling loads etc.).

3 For UK assets, the 2025 CIBSE weather data[37] must be used in line with M1.2.3

For air-conditioned buildings

4 The building is designed to meet thermal comfort criteria, using one of the following methodologies:

4.a Thermal comfort levels in occupied spaces meet the Category II requirements set out in Table A.1 of Annex A of ISO 7730:2025.(38)

4.b ANSI/ASHRAE Standard 55:2023.

4.c CIBSE Guide A Environmental design(39), Table 1.5

4.d EN 16798-1:2019

4.e Other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type), see CN1.4.

5 When generated, report the PMV and PPD indices based on the above modelling via the BREEAM Platform (see CN1.2 and CN1.3).

For naturally ventilated buildings and mechanically ventilated buildings with limited comfort cooling

6 Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, OR other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type).

7 The building is designed to limit the risk of overheating, using the adaptive comfort methodology in one of the following standards:

7.a ANSI/ASHRAE Standard 55:2023

7.b CIBSE TM59: Design methodology for the assessment of overheating risk in homes

7.c CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings

7.d CIBSE Guide A

7.e EN 16798-1:2019

7.f Other appropriate national or local industry standard to achieve the same outcome (where this sets a higher or more appropriate requirement or level for the building type), see CN1.4.

One credit – Thermal zoning and controls

8 Where present, thermal modelling analysis has informed the temperature control strategy for the building and its users.

9 The strategy for proposed heating or cooling shows that it has addressed:

9.a Thermal zoning in the building and how building services will efficiently and appropriately heat or cool these areas.

9.b The degree of user control required for these zones, appropriate for the end users, see M2.1. The strategy considers:

9.b.i User knowledge of building services.

9.b.ii The level of control required based on occupancy type, patterns, and room functions (see M2.2).

9.b.iii How the user is likely to operate or interact with the heating or cooling systems.

9.b.iv User expectations across seasons and degree of individual control.

9.c Where there is more than one system, how the proposed systems will interact and interlock with each other and how this may affect the thermal comfort of the building occupants.

9.d The need or otherwise, for an accessible user-activated manual override for any automatic systems.

Methodology

M1: Thermal comfort strategies

M1.1: Thermal comfort strategy – occupancy patterns

Where it is not possible to confirm the number of end users using the building, then the default occupancy rates given in Tra 02 Sustainable transport measures – Table 61: on page 206 can be used to determine the default number of users. Where the typical use patterns are also unknown, Tra 01 Transport assessment and travel plan – Table 52: on page 185 can be used to determine the typical opening hours of different building types. The design team need to justify or validate the occupancy number and use patterns applied in the thermal model.

M1.2: Thermal modelling – current climate

The software used to carry out the thermal modelling simulation at the detailed design stage needs to provide full dynamic analysis. Further guidance on thermal modelling can be found in CIBSE AM11 Building performance modelling.(40)

Where the weather file for the nearest location isn't representative of actual climatic conditions on site, it is acceptable to use a more representative weather file from another, nearby location, which more closely matches the climate at the actual location. Doing this can take into account additional factors such as altitude, prevailing wind direction, urban heat island effect and also proximity to climate moderating features such as the sea, mountains, woodland, and lakes.

M1.2.1: Healthcare building types (for UK only)

The appropriate industry standard for healthcare ventilation is Health Technical Memorandum 03-01: Specialised ventilation for healthcare premises (2021 version)(41) Thermal comfort levels in patient and clinical areas must align with the temperature and humidity parameters specified in HTM 03-01 (2021), which establishes performance-based requirements tailored to clinical functionality and infection control needs. Ventilation systems must be designed to prevent overheating, ensuring conditions remain appropriate for the clinical purpose of each space. For other occupied spaces not directly addressed by HTM 03-01, design should follow CIBSE Guide A Environmental Design, ensuring compatibility with healthcare requirements where spaces interconnect or are adjacent to clinical areas.

M1.2.2: Education building types (for UK schools only)

As an alternative to CIBSE TM52, an appropriate industry standard for schools include Building Bulletin 101, Ventilation of school buildings (April 2018)(42) or the Department for Education School Output Specification – Technical Annex 2F(43) as appropriate.

M1.2.3: Current climate weather file (for UK only)

Dynamic thermal simulation software packages provide the facility for building designs to be assessed under external climatic conditions specific to geographic location. Industry standard weather data for the UK is available in the form of Design Summer Years (DSYs) provided by CIBSE (2025) (www.cibse.org/weatherdata). Further details are included in Additional information.

For current climate conditions, buildings in the UK must be tested against DSY1, 2030s (2019–2039), High Emissions, 50th percentile weather file when a specific weather file is not mandated in the selected methodology.

M1.3: Mixed mode buildings

Where a building has some occupied spaces that are naturally ventilated and some occupied spaces that are air-conditioned, the thermal modelling must show that the naturally ventilated spaces meet the criteria for naturally ventilated buildings (criterion 6) and that the air-conditioned spaces meet the criteria for air-conditioned buildings (criterion 4).

M2: Thermal zoning and controls

M2.1: End user controls

Where the end users are known, the thermal controls are based on discussions with the end user.

Where the end users are unknown, the thermal controls are based on building or use-specific design guidance, case studies, and feedback.

M2.2: Spaces requiring user controls

The types of spaces for which user controls are required or would be considered beneficial are listed below.

User controls required

Spaces where users are expected to have independent control over their environment.

— Owned spaces: small rooms for a few people.
For instance, cellular offices, owned spaces in residential assets.

— Temporarily owned spaces: where occupants expect to operate the environmental controls while they are there.
For instance, meeting rooms and hotel bedrooms.

— Shared spaces.
For instance, multi-occupied areas such as open-plan offices or workshops.

User controls not required

Spaces where users are not expected to have independent control over their environment.

— Managed spaces: where environmental control is expected to be centrally managed.
For instance, atria, circulation areas, concourses, entrance halls, function halls, restaurants, libraries, and shops.

— Occasionally visited spaces.
For instance, storerooms, bookstacks in libraries, aisles of warehouses, toilets.

M2.3: Thermal comfort strategy for less complex heating or cooling systems

For buildings with less complex heating or cooling systems the thermal comfort strategy need only comply with criteria 9.a and 9.b.

Where zoning allows separate occupant control, compliance is shown where (within the occupied space) each perimeter area and the central zone are separately zoned. The depth of perimeter area must be within 7m of each external wall, and the central zone would in this instance be over 7m from the external walls.

For example, adequate TRVs placed in zones around the building perimeter, and the provision of local occupant controls to internal areas, such as fan coil units.

Note: The distance requirement for smaller buildings is approximate; however, the assessor must use sound judgment considering fully the aims of this issue, before accepting solutions that do not strictly meet the above criteria.

Examples of potentially compliant heating control measures can be found in Technology Guide CTG065 Heating control.(44)

Compliance notes

Ref	Terms	Description
Thermal modelling – current climate		
CN1	Alternative to criterion 4.a	In some cases it may be more straightforward to show compliance with the Category II design criteria in Table A.5, Annex A of ISO 7730:2025. BREEAM considers this an appropriate equivalent to Table A.1; however, the example design criteria included in Table A.5 must be applicable to the building or space type and activity levels for the project.
CN1.1	Approach to thermal model when using BMS	Where there are smart systems such as BMS in place, modelling must consider normal operating conditions, with the heating and cooling system in operation regardless of the control strategy. To correctly size the heating/cooling plant, the design team must carry out modelling to calculate the heat gains and losses throughout the year. Results of these calculations must be submitted, with the heating/cooling plant specification which would demonstrate that the building has been designed to ensure internal winter/summer temperatures will not drop below an acceptable level.
CN1.2	Acceptable thermal environment – Air-conditioned buildings	Category II requirements set out in Table A.1 of Annex A of ISO 7730:2025 are: PPD < 10% and PMV range of (-0.5 < PMV < +0.5). This also aligns with category II requirements in CIBSE Guide A and ASHRAE 55.
CN1.3	Reporting PPD and PMV figures	The PMV (Predicted Mean Vote) and PPD (Predicted Percentage Dissatisfied) values need to be entered into the BREEAM Platform. The thermal modelling specialist should be able to provide values for both the PMV and PPD for the asset. The values to report are the observed range of values for PMV and PPD:

Ref	Terms	Description
		— Across all occupied areas and, — Across all expected occupied hours. If the software or calculation method used does not generate these PMV / PPD metrics, they do not have to be provided.
CN1.4	National or local alternative to ISO standard	It is possible to use a national or local equivalent standards, however this must be approved by BRE Global. The Approved Standards list can be used to check for previously approved standards or to propose a new national or local standard.
CN1.5	Naturally ventilated buildings with heating for winter months – current climate	Where naturally ventilated occupied spaces are heated in the winter/heating season, such spaces can demonstrate compliance with the criteria for air-conditioned buildings (criterion 4) as an alternative to demonstrating compliance with criterion 6. When these naturally ventilated occupied spaces are in 'free-running mode' (i.e. outside of the winter/heating season), the spaces must meet the requirements for naturally ventilated buildings (criterion 7).
CN1.6	Thermal comfort – Historic buildings	In historic buildings, the thermal comfort requirements must still be in accordance with criteria 1–6 to demonstrate compliance, except where alternative performance standards are required by a local or national conservation body or authority. Wherever appropriate, heating systems should be modelled for continuous heating rather than intermittent heating.
Thermal zoning and control		
CN2	Occupant control – BMS and degree of control	A building management system-controlled set point with local override controls limited to a set range would satisfy the occupant control requirement. The temperature range available to building users must be confirmed as appropriate for the building type and user profile.

Evidence

Criteria	Interim design stage	Final post-construction stage
Thermal modelling – current climate		
1–7	Compliant thermal modelling report, measurements and evaluation results with confirmation that these are within the required limits. Confirmation that the modelling software is BREEAM compliant. Where applicable, PMV/PPD data from the design team. For UK specific buildings justification for the selection of projected weather file must be provided.	Thermal modelling, measurement and evaluation results reflecting any changes to the design and resultant PMV/PPD data (where relevant) with confirmation that these are within the required limits. OR Written confirmation from the building physics engineer that there have been no changes required to the thermal modelling provided at design stage. For UK specific buildings justification for the selection of projected weather file must be provided.
Thermal zoning and control		
8–9	Thermal comfort strategy highlighting the points that have been considered and decisions taken accordingly. Design drawings and relevant sections of the building specification which show the proposed HVAC systems, zoning and controls that have been specified.	Final construction drawings or equivalent to confirm the thermal comfort strategy has been implemented and confirming zoning and controls provided. Assessor site inspection report and photographic evidence to verify specified systems and controls are installed.

Definitions

Heating and cooling systems

Heating and cooling system examples include openable windows, thermostatic radiator valves (TRVs), room thermostats, ceiling fans and fan coil units with user control.

Mechanically ventilated buildings with limited comfort cooling

Mechanically ventilated buildings with limited comfort cooling is a broad term that has been used to outline a building service system that does not have full air conditioning and interlock between systems. In this situation using the adaptive comfort approach can be more appropriate to avoid over specifying plant size and specification. It is up to the assessor and design team members to choose the most appropriate thermal comfort strategy.

Occupied space

A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user. However, for the purpose of this issue, the definition excludes the following:

1. Atria or concourses.
2. Entrance halls or reception areas.
3. Ancillary space, e.g. circulation areas, storerooms and plant rooms.

Passive design

Passive design uses layout, fabric and form to reduce or remove mechanical cooling, heating, ventilation and lighting demand. Examples of passive design include optimising spatial planning and orientation to control solar gains and maximise daylighting, manipulating the building form and fabric to facilitate natural ventilation strategies and making effective use of thermal mass to help reduce peak internal temperatures.

Predicted mean vote (PMV)

The PMV is an index that predicts the mean votes of a large group of persons on the seven-point thermal sensation scale based on the heat balance of the human body. Thermal balance is obtained when the internal heat production in the body is equal to the loss of heat to the environment.

Predicted percentage dissatisfied (PPD)

The PPD is an index that establishes a quantitative prediction of the percentage of thermally dissatisfied people who feel too cool or too warm. For the purposes of ISO 7730, thermally dissatisfied people are those who will feel hot, warm, cool or cold.

Separate occupant control

Responsive heating or cooling controls for a particular area or zone of the building that can be accessed and operated by the individuals occupying that area or zone. Such controls will be located within, or within the vicinity of, the zone or area they control.

Thermal comfort

In EN ISO 7730:2025: Ergonomics of the thermal environment. Analytical determination and interpretation of thermal comfort, 'thermal comfort' is defined using the calculation of PMV and PPD indices and local thermal comfort criteria and is 'that condition of mind which expresses satisfaction with the thermal environment.' The term 'thermal comfort' describes a person's psychological state of mind and is usually referred to in terms of whether someone is feeling too hot or too cold. Thermal comfort is difficult to define because it needs to account for a range of environmental and personal factors to establish what makes people feel comfortable. The purpose of this issue is to encourage appropriate and robust consideration of thermal comfort issues and specification of appropriate occupant controls to ensure both maximum flexibility of the space and thermal comfort for most of building occupants.

Thermal dynamic analysis

Thermal comfort analysis tools can be subdivided into several methods of increasing complexity. The most complex of these and the one that provides greatest confidence in results, is the full dynamic model. This type of model enables annual heating or cooling loads, overheating risks and control strategies to be assessed.

Additional information

Appropriate industry standards

BREEAM has not attempted to list all appropriate industry standards. Any recognised collaborative industry or sector best practice standard or guidance that sets thermal performance levels, in terms of thermal comfort and design temperature, can be considered an appropriate industry standard for the purposes of this BREEAM issue, see CN1.4. CIBSE Guide A (Table 1.5) includes recommended summer and winter comfort.

CIBSE Design Summer Years (UK)

DSYs are years with various hot weather events and should be used to conduct overheating risk assessments. There are three types of DSY files available (DSY1, 2 and 3) representing different hot weather events:

- DSY1: a moderate year containing heat events with a return period of 7 years.
- DSY2: the year containing the most intense heat events.
- DSY3: the year containing the longest heat events.

The 2025 CIBSE weather datasets cover three time periods with different emission scenarios:

- 2030s: High scenario (RCP 8.5).
- 2050s: Medium (RCP 4.5) and High (RCP 8.5).
- 2080s: Low (RCP 2.6), Medium (RCP 4.5), and High (RCP 8.5).

Hea 06a Acoustic performance

(all buildings, all countries except UK)

For buildings in the UK, see Hea 06b Acoustic performance on page 130.

Aim

To ensure the building provides an appropriate acoustic environment to enhance the comfort of building users.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 4	None	All (see ref 1.0 and 1.1)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Indoor ambient noise** Where there are no new mechanical or air conditioning systems being installed as part of the fit-out, the indoor ambient noise criteria can be filtered out of the assessment.
1.1	**Indoor ambient noise** Where an SQA confirms that it is not possible to meet the indoor ambient noise criteria in accordance with the relevant tables in full, due to the scope of works. Compliance can be demonstrated with the below, through measurement and assessment by an SQA: — Do not change the indoor ambient noise levels where local services or break in noise dominate. OR — Reduce the indoor ambient noise levels.

Building type specific notes

Ref	Building type specific note
2.0	**Building types without areas 'used for speech'** Where a building type does not have areas 'used for speech', it does not need to comply with the relevant 'reverberation times' criteria. In these instances, the credit available for reverberation can be awarded by default where the building complies with the indoor ambient noise level and sound insulation criteria.

Assessment criteria

Prerequisite – Suitably qualified acoustician

1 A suitably qualified acoustician (SQA) is appointed by the client at the appropriate stage in the procurement process (but no later than completion of concept design) to provide early design advice on:

1.a External sources of noise impacting the chosen site.

1.b Site layout and zoning of the building for good acoustics.

1.c Acoustic requirements for users with special hearing and communication needs.

1.d Acoustic treatment of different zones and façades.

Acoustic performance standards

For all building types, except Residential institutions (long-term stay).

One credit – Indoor ambient noise

2 All unoccupied spaces comply with the indoor ambient noise level targets as detailed in the more rigorous of criteria 2.a or 2.b below:

2.a Indoor ambient noise level targets within national building regulations or other appropriate good practice standards.

2.b Where national building regulations or good practice standards do not exist for the building type or do not provide indoor ambient noise targets, the indoor ambient noise levels comply with 'good practice' criteria levels outlined in Table 24 on the next page.

3 An SQA carries out ambient noise measurements to ensure that the relevant spaces achieve the required levels. Where the measurements identify that spaces do not meet the standards, remedial works are carried out and the measurements repeated to confirm that the levels are achieved prior to handover and occupation.

Education buildings only:

4 Teaching and learning spaces with lightweight roofs and roof glazing demonstrate that the reverberant sound pressure levels in these rooms are not more than 25 dB above the appropriate limits given in Table 24 on the next page.

One credit – Sound insulation

5 The sound insulation between acoustically sensitive rooms and other occupied areas comply with the privacy requirements, as detailed in the more rigorous of criteria 5.a or 5.b below:

5.a Sound insulation between acoustically sensitive rooms and other occupied areas comply with targets within national regulations or other appropriate good practice standards.

OR

5.b Where relevant national regulations or good practice standards do not exist for the building type or do not provide sound insulation performance targets, the sound insulation between acoustically sensitive rooms and other occupied areas complies with the following Speech Privacy Potential: $D_w + L_{AeqT} > 75$.

5.c Where privacy is viewed to be critical by the client or design team (e.g. doctor's consulting room, consulting room within a bank) or where the room is adjacent to a noisy space such as a music room, the area shall comply with an enhanced Speech Privacy Potential: $D_w + L_{AeqT} > 85$.

6 The source and receive room sound pressure levels from which D_w is determined are measured in accordance with (EN) ISO 16283-1:2014+A1:2017 and rated in accordance with (EN) ISO 717-1:2020. Measurements by the SQA must be based on finished, but unfurnished rooms, accounting for, and to include the effect of, any carpets and acoustically absorbent ceilings specified.

One credit – Reverberation times

7 Rooms or areas used for speech (including meeting rooms and rooms for public speaking) or rooms used for music performance and rehearsal, achieve reverberation times as detailed in the more rigorous of criteria 7.a OR 7.b and 7.c as measured by the SQA:

7.a Demonstrate that the reverberation time or equivalent absorption area for relevant spaces complies with targets within relevant national regulations or other appropriate good practice standards.

7.b Where relevant national regulations or good practice standards do not require the control of reverberation time, achieve reverberation times compliant with Table 25 on page 122.

7.c If relevant to the assessed building, all areas used for teaching, training and educational purposes achieve reverberation times compliant with Table 26 on page 122.

Acoustic performance standards – Residential institutions (long-term stay)

Up to four credits – Sound insulation

8 The building meets the acoustic performance standards and testing requirements as detailed in the more rigorous of EITHER:

8.a Airborne and impact sound insulation values comply with the performance improvement standards, as compared to the relevant national regulations outlined in Table 27 on the next page OR

8.b Airborne and impact sound insulation levels comply with the performance standards outlined in Table 28 on the next page unless otherwise stated within these criteria.

9 A programme of pre-completion testing is carried out by the SQA EITHER:

9.a Based on the normal programme of testing described in the relevant national regulations for every group or sub-group of rooms for residential purposes; this must demonstrate that the performance standards detailed within this issue are achieved OR

9.b Where there are no relevant national regulations in place, or they require laboratory measurements to demonstrate compliance, the programme of on-site pre-completion testing must be carried out based on the 'Frequency of testing required' guidance (see calculation procedures in Methodology on page 123) for every group or sub-group of rooms.

10 The number of credits awarded will depend on improvement to the national regulations determined according to Table 27 on the next page or Table 28 on the next page. Where commercial space is below the residential space, only airborne sound insulation tests will be required.

Checklists and tables

Table 24: A selection of good practice indoor ambient noise level targets in unoccupied spaces

Function of area	Indoor ambient noise level*
General spaces (staffrooms, restrooms)	≤ 40 dB L_{AeqT}
Single occupancy offices	≤ 40 dB L_{AeqT}
Multiple occupancy offices	40–50 dB L_{AeqT}
Meeting rooms	35–40 dB L_{AeqT}
Receptions	40–50 dB L_{AeqT}
Spaces designed for speech, e.g. teaching, seminar or lecture rooms	≤ 35 dB L_{AeqT}
Concert hall, theatre or auditoria	≤ 30 dB L_{AeqT}
Informal café or canteen areas	≤ 50 dB L_{AeqT}
Catering kitchens	≤ 50 dB L_{AeqT}
Restaurant areas	40–55 dB L_{AeqT}
Bars	40–45 dB L_{AeqT}
Retail areas	50–55 dB L_{AeqT}
Manual workshops	≤ 55 dB L_{AeqT}
Sound recording studios	≤ 30 dB L_{AeqT}
Laboratories	≤ 40 dB L_{AeqT}
Sports halls or swimming pools	≤ 55 dB L_{AeqT}
Library areas	40–50 dB L_{AeqT}
Hotel bedrooms	< 35 dB L_{AeqT}
* Where ranges of noise levels are specified and privacy is not deemed by the final occupier to be an issue, it is acceptable to disregard the lower limit of the range and consider the noise level criteria to be lower than or equal to the upper limit of the range.(45)	

Table 25: Guide to reverberation time, T, at 500 Hz in unoccupied rooms for speech and music

Room volume m^3	Reverberation time T* s	
	Speech	Music
50	0.4	1.0
100	0.5	1.1
200	0.6	1.2
500	0.7	1.3
1000	0.9	1.5
2000	1.0	1.6
* Where the reverberation times stated above or in the referenced documents are not appropriate for the type of space or building being assessed, the acoustician must confirm why this is the case. In addition, the acoustician must set alternative appropriate reverberation times at the design stage and provide these to demonstrate compliance.		

Table 26: Performance standards for reverberation in teaching and study spaces – mid-frequency reverberation time, Tmf, in finished but unoccupied and unfurnished rooms

Type of room (receiving room)	Tmf (seconds)*
Open plan	
Teaching areas	< 0.8
Resource areas	< 1.0
Lecture rooms	
Small (fewer than 50 people)	< 0.8
Large (more than 50 people)	< 1.0
Recording studio	0.6–1.2
Control room for recording	< 0.5
Libraries	< 1.0
Audio-visual, video conference rooms	< 0.8
* Tmf is the arithmetic average of the reverberation times in the 500 Hz, 1 kHz and 2 kHz octave bands.(46)	

Table 27: Airborne and impact sound insulation performance improvement standards for national legislation or standards

Credits	Airborne sound insulation dB	Impact sound insulation dB
	Separating walls and floors between units*	Separating floors between units*
1	Insulation values are at least 3 dB higher	Insulation values are at least 3 dB lower**
3	Insulation values are at least 5 dB higher	Insulation values are at least 5 dB lower**
4	Insulation values are at least 8 dB higher	Insulation values are at least 8 dB lower**
* Only habitable rooms with separating walls and floors need to be assessed, see M2. ** The index used to express impact sound insulation is usually based on the level of transmitted impact sound, such that a lower measured value indicates greater resistance to impact sound transmission. If the converse for the locally defined national index is true, the credit award will be based on the same performance increase as detailed for the airborne sound insulation and an accompanying statement from the SQA.		

Table 28: Performance standards for airborne and impact sound insulation levels

Credits	Airborne sound insulation for DnT,w + Ctr dB (minimum values)	Impact sound insulation for L'nT,w dB (maximum values)
	Separating walls and floors between units*	Separating floors between units*
1	48	59
3	50	57
4	53	54
* Only habitable rooms with separating walls and floors need to be assessed, see M2.		

Methodology

M1: Testing, measurement and calculation procedures – All building types except residential institutions (long term stay)

Where specific guidance on testing, measurement and calculation is not stated in the criteria tables above for the relevant building type, or within the relevant standard or guidance referenced, the following procedures can be followed by the SQA when measuring or calculating the levels required to demonstrate compliance with this BREEAM issue. Where it is necessary to deviate from the procedures, the SQA should provide a reason for doing so and confirm that the alternative procedures are adequate for demonstrating that the asset meets the acoustic performance requirements.

Where a programme of pre-completion testing identifies that spaces do not meet the standards, remedial works must be undertaken in accordance with M3.

Measurements of airborne and impact sound insulation should be made in accordance with the relevant part of the ISO 16283 series. Measurements should be conducted between one in four pairs of adjacent rooms of each room type or performance requirements category and construction type.

For measurements of reverberation time, the relevant principles of ISO 354:2003 should be used and the guidance provided in ISO 16283-1:2014 should be followed in respect of the number of source and microphone positions, and decay measurements.

For measurements of ambient noise, when no specific guidance is available, the following procedures should be used:

1. Noise from both internal sources (e.g. mechanical ventilation systems, plant noise, noise-making systems) and external sources (e.g. traffic noise transmitted via the building façade) should be included, and, where windows are openable as part of the ventilation strategy, these should be assumed to be open for the purposes of calculations and open for measurements. If openable windows are not part of the background or permanent ventilation strategy, then these should be assumed to be closed for the purposes of calculation and closed for measurements.
2. Noise from occupants and office equipment (e.g. computers) should not be included in the measurements.
3. Unless otherwise stated in the specific guidance, a rate of testing of at least 1 in 10 rooms or spaces of each performance level shall be subject to on-site performance testing.
4. Measurements should be made in at least four rooms in which noise levels can be expected to be greatest either because they are on the noisiest façade or because they are on a naturally ventilated façade.
5. Where different ventilation strategies are used, measurements should be conducted in rooms utilising each strategy. Otherwise, measurements should be made in rooms on the noisiest façade.
6. T in L_{AeqT} is taken as the duration of the normal working day (typically 8 hours between 09.00 and 17.00).
7. Measurements need not be made over a period of 8 hours if a shorter measurement period can be used. In this case, measurements should be made when external noise levels are representative of normal conditions throughout the day.
8. Measurement periods of less than 30 minutes may give representative values for indoor ambient noise levels and may be utilised where this is the case. However, measurement periods shorter than 5 minutes should not be used.
9. Measurements should be taken in a minimum of three locations in rooms at a height of 1.2 m above the floor level and at least 1 m away from any surface.
10. The measured level of ambient noise should be used to determine compliance with the criteria for acoustically sensitive rooms. If at the time of acoustic commissioning it is not possible to measure ambient noise levels in the absence of construction or other extraneous noise sources that will not be present when the building is complete, then, for mechanical services the lower level of 35 dB, L_{Aeq} or the lowest design limit for the acoustically sensitive space should be used.

The above is intended as guidance for undertaking acoustic testing or measurements to demonstrate compliance with the performance requirements in BREEAM.

M2: Testing, measurement and calculation procedures – Residential institutions (long term stay)

M2.1: Frequency of testing

When the country does not have legislation regarding frequency of testing, the following guidance below sets out the number of airborne and impact sound insulation tests to be conducted between unit on each group or sub-group (see Definitions). Measurements of airborne and impact sound insulation should be made in accordance with the relevant part of the ISO 16283 series and should be performed by an SQA. Where a programme of pre-completion testing identifies that spaces do not meet the standards, remedial works must be undertaken in accordance with M3.

Sound insulation between units is assessed in habitable rooms with separating walls and floors between units.

As a minimum, one set of tests is required for every 10 units in a group (i.e. houses or apartments) and each sub-group (typically these are different construction type groups) is required. In the event of less than 10 units, one set of tests is carried out. The number of tests required are as follows:

Table 29: Composition of test set

Group type	Airborne tests – separating walls	Airborne tests – separating floors	Impact tests – separating floors	Total
Units with separating walls only. *e.g. houses or bungalows*	2	0	0	2
Units with separating walls and floors. *e.g. apartments*	2	2	2	6

The actual number of tests possible may be limited by the layout. Where this is the case then the SQA should clearly identify why the full number of tests was not feasible within the test report or covering correspondence.

Where a house is detached, no measurements are required, and the sound insulation credits can be awarded by default.

M2.2: Example of testing series and compliance

Example 1

If a development consists of three houses; one set of tests will be required:

— Two airborne sound insulation tests of separating walls between house units.

Example 2

If a development comprises 42 houses and 59 apartments; then five sets of tests between houses and 6 sets of tests between apartments will be required:

— 10 airborne sound insulation tests of separating walls between houses units
— 12 airborne sound insulation tests of separating walls between apartments
— 12 airborne sound insulation tests of separating floors between apartments
— 12 impact sound insulation tests of separating floors between apartments

M3: Remedial works

Where a programme of pre-completion testing identifies that spaces do not meet the standards for indoor ambient noise, sound insulation, or reverberation times, remedial works must be carried out prior to handover and occupation, and the spaces retested to ensure compliance. Remedial works must be carried out to all affected and potentially affected areas, including rooms or spaces previously untested of a similar construction and performance requirement.

Compliance notes

Ref	Terms	Description
CN1	Other appropriate good practice standards or regulations	As detailed in the assessment criteria it is possible to use a national or local equivalent to the BREEAM requirements stated; however this must be approved by BRE Global. The Approved Standards list can be used to check for previously approved standards or to propose a new national or local standard.
CN1.1	Speech Privacy Potential	Where privacy is required or the ambient targets include a minimum as well as maximum limit, the Speech Privacy Potential (SPP) may be considered. The SPP is the sum of the weighted level difference of the partition (DW) and the measured ambient background noise level in the receive room (LA or NR (dBA)). To ensure the desired minimum background sound level necessary to achieve speech privacy, productivity and/or comfort goals, a sound masking system may be required.

<table>
<tr><th>Ref</th><th>Terms</th><th>Description</th></tr>
<tr><td></td><td></td><td>The sound masking system should be installed and in operation at the time of the acoustic testing to demonstrate compliance.</td></tr>
<tr><td>CN1.2</td><td>Reverberation times</td><td>Where the reverberation time required by the relevant standard is not appropriate for the type of space or building being assessed, the SQA must confirm why this is the case. In addition the SQA must set alternative appropriate reverberation times at the design stage and provide these to demonstrate compliance.</td></tr>
<tr><td>CN1.3</td><td>Programme of testing</td><td>It is not acceptable to undertake a shorter test programme due to site readiness on the day of testing. If this issue arises additional testing should be scheduled. It may be that testing at less than the typical regime identified would be acceptable in some instances. Where this is the case, clear reasoning must be provided by the SQA prior to awarding the credits.</td></tr>
<tr><td>CN1.4</td><td>Internal partition sound insulation criteria to internal doors</td><td>Where sound insulation criteria apply to internal partitions the calculations do need to include any doors which are part of the wall in question. While sound insulation performance of a typical door will be lower than for a typical wall, with careful design, specification and detailing, this can be overcome.</td></tr>
<tr><td>CN1.5</td><td>Mixed-use buildings</td><td>In the case of a mixed-use buildings, the 'Acoustic performance' credits are adjusted to account for the credits available when this differs for the asset types present. See Guidance Note 20 (GN20) for full details.

Criteria for all relevant function areas must be achieved. Where the project contains a mix of residential institutions and non-residential function areas, then the following credit scoring applies:<table><tr><td>Non-residential credits achieved</td><td>1</td><td>2</td><td>3</td><td></td></tr><tr><td>Residential institutions (long-term stay) and credits achieved</td><td>1</td><td></td><td>3</td><td>4</td></tr><tr><td>Overall credits achieved</td><td>1</td><td>2</td><td>3</td><td>4</td></tr></table></td></tr>
<tr><td>CN1.6</td><td>Historic buildings</td><td>For historic buildings, full credits available can still be achieved where full compliance has not been met where confirmation is provided from an SQA that the design has improved the acoustic performance as much as possible taking into account the restrictions as detailed in a report from a conservation officer.</td></tr>
<tr><td colspan="3">Building type specific</td></tr>
<tr><td>CN2</td><td>Long term stay residential institutions. Rooms not covered by residential criteria.</td><td>Long term stay residential institutions often contain a mixture of 'non-residential' areas such as offices, small retail outlets, meeting rooms etc. and residential areas, e.g. self-contained dwellings or rooms for residential purposes.
Where less than 5% of the floor area of the assessed building includes 'non-residential' areas, these areas do not need to be assessed, hence only the residential spaces need to be assessed against the residential criteria to demonstrate compliance with criterion 8 on page 121.
Where more than 5% of the floor area of the assessed building includes areas other than self-contained dwellings or rooms for residential purposes:
— If awarding 1 credit, only the self-contained dwellings or rooms for residential purposes need to be assessed to demonstrate compliance.
— If awarding 3 or 4 credits the 'non-residential' areas must meet the relevant criteria for their function, and the self-contained dwellings or rooms for residential purposes need to be assessed to demonstrate compliance.

The calculation for the percentage of floor area that is 'non-residential' should only include occupied spaces.</td></tr>
<tr><td>CN2.1</td><td>Hotel type – Sound insulation</td><td>Bedrooms in hotels must be considered acoustically sensitive rooms. Sound insulation (DnT,w) for partitions and floors between rooms and between rooms and corridors should be > 50 dB.</td></tr>
<tr><td>CN2.2</td><td>Residential only – Acoustic testing</td><td>Testing should be between habitable rooms on the ground floor and at higher storey levels, if applicable. Where there are not enough suitable separating walls or floors in a development to carry out the number of tests specified in the relevant national regulations or standards, all of the available suitable separating walls or floors must be</td></tr>
</table>

Ref	Terms	Description
		tested. Note: separating walls can be defined as those walls which separate dwellings.
CN2.3	Residential only – Mixed use developments	For mixed use developments where commercial premises share a separating wall or floor with residential spaces, a SQA shall propose an appropriate baseline performance making reference to national or international guidance, or good practice.
CN2.4	Residential only – Commercial space	Where a commercial space is separated from a dwelling or room for residential purposes by a separating wall or floor, testing shall be carried out between the commercial space and dwelling, with the commercial space being used as the source room irrespective of the volume.
CN2.5	Residential only – Pre-completion testing	No pre-completion testing is required where separating walls or floors only occur between non-habitable rooms, or non-habitable rooms and other spaces. In such cases, three credits can be awarded following an assessment by a SQA confirming that the constructions detailed would be capable of achieving the relevant performance requirements. No pre-completion testing is required where the dwellings are detached. In such cases, four credits can be awarded by default.
CN2.6	Residential only – Measurement procedures	The appointed acoustician must confirm that the acoustic performance has been measured or calculated in accordance with these procedures. Where the acoustician has felt it necessary to deviate from these procedures, they must give justifiable reasons why they have done so.

Evidence

Criteria	Interim design stage	Final post-construction stage
Prerequisite – Suitably qualified acoustician		
1	Professional report or study from the acoustician providing early design advice. Evidence to verify that the acoustician meets the definition of a suitably qualified acoustician and were appointed at an appropriate design stage.	No further actions required post-construction, no additional evidence is required other than that listed for the design stage.
Acoustic performance standards		
2–7	The relevant section of the building specification, clauses of the contract or a letter of commitment to meet the relevant acoustic performance standards, carry out all pre-completion testing using an SQA and complete remedial work where necessary. Where available, a report from a suitably qualified acoustician (SQA) may be used to confirm required performance standards will be achieved.	Copy of acoustic field test results and calculations to show acoustic performance standards have been achieved and evidence to support they were completed by a compliant SQA.
Acoustic performance standards – Residential institutions (long-term stay)		
8–10	The relevant section of the building specification, clauses of the contract or a letter of commitment to meet the relevant acoustic performance standards, carry out all pre-completion testing by an SQA and complete remedial work where necessary. Where available, a report from a suitably qualified acoustician (SQA) may be used to confirm required performance standards will be achieved.	Copy of the sound insulation field test results and calculations to show the sound insulation performance standards have been achieved. Evidence to confirm the testing regime and support testing was completed by a compliant SQA.

Definitions

Acoustically sensitive rooms

Where the term 'acoustically sensitive rooms' is referenced in this BREEAM issue, it refers to any room or space the design team or client deems to be acoustically sensitive for the purposes of privacy, which may include the following types of space or rooms (where specified):

1. Single and multiple occupancy offices.
2. Meeting, interview, consulting or treatment rooms.

In addition:

1. Educational buildings or spaces: rooms for teaching and learning, i.e. classrooms, lecture theatres.
2. Rooms used for public speaking or seminars.
3. Any other room or space the design team or client deems to be acoustically sensitive for the purposes of privacy.

Cafe, canteen, catering kitchen, restaurants, bars

For the purposes of the acoustic performance credit:

— Informal cafés or canteen areas, catering kitchens are generally services provided by an organisation such as a college, factory, or company for its students or staff.

— Restaurants are places where food is served to the public on the premises. Compared to the above, restaurants can be independent and not ancillary, as per the BREEAM definition and scope.

— Bars are establishment where soft drinks or alcoholic drinks and sometimes other refreshments are served. They might be on their own or auxiliary to other functions, e.g. hotels.

Groups

A group is a similar type of unit – for example a group of homes of similar size, layout and design are considered a group, this is typically defined by groups of houses, apartments or bungalows. If significant differences in construction type occur within any of these groups, sub-groups should be established accordingly. This may be to recognise different acoustic conditions (for example, all the homes facing a busy road) or different construction types for separating walls (see sub-group).

Habitable rooms

For the purpose of this issue, habitable rooms include any room where individuals will sit or lie down and require a reasonably quiet environment to concentrate or rest. Such rooms are bedrooms, living rooms, dining rooms, studies, as well as kitchen-dining and kitchen-living rooms.

Indoor ambient noise level, L_{AeqT}

The measured indoor ambient noise level in the acoustically sensitive room, weighted for human sensitivity to different frequencies. For awarding design stage credits, the design ambient noise level can be used.

Lightweight roofs

Roofs that have a mass per unit area less than 150 kg/m²

Multiple occupancy offices

Office space that is not cellular in nature, i.e. it is open plan, and designed to accommodate more than two desk spaces or workstations.

Non-habitable rooms

For the purpose of this issue, non-habitable rooms include any room that is not considered a habitable room (as defined above). This includes rooms such as kitchens, bathrooms, toilets, hallways, garages and laundry rooms.

Occupied spaces

A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user. Please note there is a specific, unrelated, definition of Unoccupied spaces on the next page with reference to acoustic testing and measurement – see below.

Pre-completion sound testing

Tests should be carried out once the build is essentially complete, but may be carried out prior to or post-decoration. In the case of dwellings, unless stated otherwise within relevant national building regulations or standards, the impact sound insulation tests should be carried out before floor finishes such as carpets, wood flooring or vinyl coverings have been installed.

Room for residential purposes

A room, or a suite of rooms which is not a dwelling (house or a flat) and which is used by one or more persons to live and sleep. It includes a room in a hostel, hotel, boarding house, hall of residence or residential home, whether or not the room is separated from or arranged in a cluster group with other rooms, but does not include a room in a hospital, or other similar establishment, used for patient accommodation.

Single occupancy offices

Cellular office space designed to accommodate one or two desk spaces or workstations (typically no greater than 10 m^2).

Sub-groups

Rooms for residential purposes; sub-grouping should be by type of separating floor and type of separating wall. The construction of flanking elements (i.e. elements above, below and on either side of the space, for example walls, floors, cavities) and their junctions are also important. Where there are significant differences between flanking details, further sub-grouping will be necessary. Sub-grouping may not be necessary for rooms for residential purposes that have the same separating wall or separating floor construction, with the same associated flanking constructions, and where the room dimensions and layouts are broadly similar. Some rooms for residential purposes may be considered to have unfavourable features; an example could be apartments with large areas of flanking wall without a window at the gable end. It would be inappropriate for these to be included as part of a group and these should form their own sub-groups. The SQA can use their judgement to define suitable sub-groups for assessment.

Suitably qualified acoustician (SQA)

An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:

1. Has a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting acoustics in relation to construction and the built environment; including acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.
2. Holds a recognised qualification in acoustics and membership of an appropriate professional body.

Where an SQA is verifying the acoustic measurements or calculations carried out by another acoustician who does not meet the SQA requirements, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to:

1. Represent good industry practice.
2. Be appropriate given the building being assessed and scope of works proposed.
3. Avoid invalid, biased and exaggerated recommendations.

Additionally, written confirmation from the third-party verifier that they comply with the definition of an SQA is required.

Unit

A unit is defined by the need to maintain privacy: typically, a self-contained dwelling like a house or apartment is a unit, but it could also be a sub-division within a residential institution. Where this is unclear, the SQA can use their judgement to define a unit for assessment.

Unoccupied spaces

Where the term 'unoccupied space' is referenced in this BREEAM issue it refers to the nature of the space for the purpose of carrying acoustic calculations or measurements, i.e. such measurements must be carried out when the space is unoccupied.

Users with special hearing and communication needs

Users with special hearing or communication needs includes, but are not limited to, people with permanent hearing impairment or with severe or complex needs, including:

- speech, language, and communication difficulties
- visual impairments
- fluctuating hearing impairments caused by conductive hearing loss
- attention deficit hyperactivity disorder (ADHD)
- an auditory processing disorder or difficulty
- being on the autistic spectrum

Such users should be considered by the suitably qualified acoustician, along with the other points a-d when giving early design advice regarding room layout, sound insulation and reverberation times etc. The above is a typical list of users and is not intended to be a list mandatory requirement.

Weighted level difference, D_w

Single number quantity that characterises airborne sound insulation between rooms, but which is not adjusted to reference conditions. Note: Weighted level difference is used to characterise the insulation between rooms in a building as they are; values cannot normally be compared with measurements made under other conditions (see (EN) ISO 717-1).

Weighted standardised impact sound pressure level, $L_{nT,w}$

This is defined as the 'unit for rating impact airborne sound insulation on-site'.

Weighted standardised level differences, $D_{nT,w}$

This is defined as the 'unit for rating airborne sound insulation on-site'.

Additional information

Noise rating (NR) curves

Noise assessments based on NR curves are often used by building services consultants to predict internal noise levels due to mechanical ventilation systems. However, the BREEAM requirement uses the indoor ambient noise level, $L_{Aeq,T}$ which includes external noise transmitted via the façade as well as internal noise such as that from mechanical ventilation systems. In the absence of strong low frequency noise, $L_{Aeq,T}$ can be estimated from the NR value using the following formula: $L_{Aeq,T} \approx$ NR + 6 dB. Therefore, if the NR value is known, but not the sound pressure levels in the individual frequency bands, an estimate for the indoor ambient noise level $L_{Aeq,T}$ can still be determined from the NR value for the building services noise. The $L_{Aeq,T}$ for the external noise transmitted via the façade must then be combined with the $L_{Aeq,T}$ for the building services.

Hea 06b Acoustic performance

(all buildings, UK)

For buildings outside the UK, see Hea 06a Acoustic performance on page 119.

Aim

To ensure the building provides an appropriate acoustic environment to enhance the comfort of building users.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 4	None	All (see ref 1.0 and 1.1)

Assessment type specific notes

Ref	Assessment type specific notes
1.0	**Indoor ambient noise** Where there are no new mechanical or air conditioning systems being installed as part of the fit-out, the indoor ambient noise criteria can be filtered out of the assessment.
1.1	**Indoor ambient noise** Where an SQA confirms that it is not possible to meet the indoor ambient noise criteria in accordance with the relevant tables in full, due to the scope of works. Compliance can be demonstrated with the below, through measurement and assessment by an SQA: — Do not change the indoor ambient noise levels where local services or break in noise dominate. OR — Reduce the indoor ambient noise levels.

Building type specific notes

Ref	Building type specific notes
2.0	**Prisons and law court buildings** For custodial spaces where anti-barricade cell doors are required, refer to Ministry of Justice standards for cell doors or equivalent doors approved by Ministry of Justice for use in cells.
2.1	**Building types without areas 'used for speech'** Where a building type does not have areas 'used for speech', it does not need to comply with the relevant 'room acoustics' criteria. In these instances, the credit available for room acoustics can be awarded by default where the building complies with the indoor ambient noise level and sound insulation criteria.

Assessment criteria

Up to three credits – Acoustic performance

For all building types, except residential institutions (short-term and long-term stay) and hospitality.

1 The building meets the appropriate acoustic performance standards and testing requirements defined in the relevant table below. These tables define criteria for the acoustic principles of:

1.a Sound insulation

1.b Indoor ambient noise level

1.c Room acoustics.

OR

2 A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion 1, setting out the performance requirements for each and the testing regime required.

Table 30: BREEAM acoustic criteria for education buildings

Education buildings (three credits)	
First credit – Sound insulation	
Criteria	Achieve the performance standards set out in Section 1 of Building Bulletin 93: Acoustic design of schools: performance standards, February 2015 (BB93) relating to airborne sound insulation between spaces and impact sound insulation of floors.(47)
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the BB93 requirements and the Association of Noise Consultants (ANC) Good Practice Guide, Acoustic testing of Schools.(48)
Second credit – Indoor ambient noise levels	
Criteria	Achieve the indoor ambient noise level standards set out within Section 1 of BB93 for all room types.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the ANC Good Practice Guide, Acoustic testing of schools.
Third credit – Room acoustics	
Criteria	Room acoustics (Control of reverberation, sound absorption and speech transmission index (STI)): **Teaching and study spaces** achieve the requirements relating to reverberation time for teaching and study spaces set out within Section 1 of BB93. **Open plan teaching spaces** achieve the performance requirements relating to reverberation time and STI set out within Section 1 of BB93. **Corridor and stairwells**, for those that give direct access to teaching and study spaces, achieve the performance requirements relating to sound absorption.
Testing requirement	**Teaching and study spaces:** A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the requirements of BB93 and ANC Good Practice Guide, Acoustic testing of schools. **Open plan teaching spaces:** A programme of pre-completion acoustic testing of reverberation time is carried out within open plan teaching spaces. The measurement is carried out by a compliant test body in accordance with the requirements of BB93 and ANC Good Practice Guide, Acoustic testing of schools. STI testing is not required. To demonstrate compliance the SQA shall undertake measurements of reverberation times to compare against the STI model. The SQA should provide a report confirming that the surface finishes and distribution of sound absorption within the completed space is in line with the design intent implemented within the STI model. Where significant changes or differences are observed, the SQA shall re-model the space accordingly to demonstrate that the STI measurement is met by the completed spaces. **Corridors and stairwells:** Installation of a specification compliant with the BB93 criteria demonstrates compliance. A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.

Table 31: BREEAM acoustic criteria for healthcare buildings

Healthcare buildings (three credits)	
First credit – Sound insulation	
Criteria	Achieve the airborne sound insulation performance standards set out in Section 2 of HTM 08-01: Acoustic design requirements, 2013 determined according to the privacy requirements using both Table 3 and Table 4 from HTM 08-01.(49) The weighted standardised impact sound pressure level (L'nT,w) must not exceed 65 dB for floors over noise-sensitive rooms, following the guidance in HTM 08-01. For assessments in Scotland, see also Country-specific guidance on page 139.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in

Healthcare buildings (three credits)	
	accordance with the requirements of Section 7 of HTM 08-01. For assessments in Scotland, see also Country-specific guidance on page 139
Second credit – Indoor ambient noise levels	
Criteria	The indoor ambient noise requirements for noise intrusion from external sources in Table 1 of HTM 08-01 are not exceeded. The values for internal noise from mechanical and electrical services in Table 2 of HTM 08-01 are not exceeded. For assessments in Scotland, see also Country-specific guidance on page 139.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the Section 7 of HTM 08-01: Acoustics. For assessments in Scotland, see also Country-specific guidance on page 139.
Third credit – Room acoustics	
Criteria	Acoustic environment (Control of reverberation and sound absorption): Achieve the requirements relating to sound absorption set out in Section 2 of HTM 08-01. For assessments in Scotland, see also Country-specific guidance on page 139.
Testing requirement	Installation of a specification compliant with the HTM 08-01 criteria demonstrates compliance. A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.

Table 32: BREEAM acoustic criteria for office buildings

Office buildings (three credits)	
First credit – Sound insulation	
Criteria	The sound insulation between rooms and other occupied areas complies with the performance criteria given in Section 7 of BS 8233:2014.(50) This should be based on the layout and function of the different spaces within the building.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on page 134.
Notes	If testing is to be carried out where the office is not yet furnished, then section 7.5 of BS 8233:2014 should be referred to when determining the performance criteria. Where the office is to be furnished at the time testing is carried out, then refer to section 7.7.6 of BS 8233:2014 for the relevant performance criteria.
Second credit – Indoor ambient noise levels	
Criteria	Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on page 134.
Third credit – Room acoustics	
Criteria	Acoustic environment (control of reverberation and sound absorption): Achieve the requirements relating to sound absorption and reverberation times, where applicable, set out in Section 7 of BS 8233:2014.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on page 134. For spaces where the acoustic environment is controlled through the use of defined amounts of sound absorption, installation of a specification compliant with the BS 8233:2014 criteria demonstrates compliance. A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.

Table 33: BREEAM acoustic criteria for law court buildings

Law court buildings (three credits)	
First credit – Sound insulation	
Criteria	The sound insulation between acoustically sensitive rooms and other occupied areas complies with

Law court buildings (three credits)	
	the performance targets given in BS 8233:2014 and the section on 'Acoustics' in Chapter 5 of the Court and Tribunal Design Guide (CTDG).(51)
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the requirements of BS 8233:2014, the Court and Tribunal Design Guide (CTDG), and the methodology section below on 'Testing, measurement and calculation procedures' (where applicable).
Second credit – Indoor ambient noise levels	
Criteria	Achieve indoor ambient noise levels that comply with the requirements of BS 8233:2014 and the section on 'Acoustics' in Chapter 5 of the Court and Tribunal Design Guide (CTDG).
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with BS 8233:2014 and the Court and Tribunal Design Guide (CTDG).
Third credit – Room acoustics	
Criteria	Acoustic environment (Control of reverberation and sound absorption): Achieve the requirements relating to sound absorption and reverberation times, where applicable, set out in Chapter 5 of the Court and Tribunal Design Guide (CTDG).
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with Chapter 5 of the Court and Tribunal Design Guide (CTDG) and the methodology section below on 'Testing, measurement and calculation procedures' (where applicable).

Table 34: BREEAM acoustic criteria for all building types (excluding education, healthcare, office, and law courts)

All other building types (three credits)	
First credit – Sound insulation	
All room functions	
Criteria	The sound insulation between rooms and other occupied areas complies with the performance criteria given in Section 7 of BS 8233:2014. Alternatively, propose performance standard based on demonstrably best practice.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on the next page.
Rooms with specific functions	Educational space (teaching and lecture spaces) refer to Table 30 on page 131. Medical treatment rooms refer to Table 31 on page 131
Second credit – Indoor ambient noise levels	
Criteria	Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on the next page.
Rooms with specific functions	Education space (teaching and learning spaces) refer to Table 30 on page 131. Medical treatment rooms refer to Table 31 on page 131.
Third credit – Room acoustics	
Criteria	Achieve the requirements relating to sound absorption and reverberation times, where applicable, set out in Section 7 of BS 8233:2014.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on the next page. For spaces where the acoustic environment is controlled through the use of defined amounts of sound absorption, installation of a specification compliant with the BS 8233:2014 criteria demonstrates compliance. A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.
Rooms with specific functions	Educational space (teaching and learning spaces) refer to Table 30 on page 131. Medical treatment rooms refer to Table 31 on page 131.

Up to four credits – Acoustic performance for residential institutions (short-term and long-term stay) and hospitality

3 The building meets the appropriate acoustic performance standards and testing requirements defined in the relevant table below. These tables define criteria for the acoustic principles of:

3.a Sound insulation

3.b Indoor ambient noise level

3.c Room acoustics.

Table 35: BREEAM acoustic criteria for residential institutions (short term and long term stay) and hospitality

Residential institutions (short term and long terms stay) and hospitality – up to four credits	
First and second credit – Sound insulation	
Criteria	**One credit** Airborne sound insulation values are at least 3 dB higher and impact sound insulation values are at least 3 dB lower than the performance standards in the relevant building regulations or standards. **Two credits** Airborne sound insulation values are at least 5 dB higher and impact sound insulation values are at least 5 dB lower than the performance standards in the relevant building regulations or standards.
Testing requirement	A programme of pre-completion testing is carried out by a compliant test body based on the normal programme of testing described in the relevant building regulations or standards for every group or sub-group of dwellings (houses, flats or rooms for residential purposes) and this must demonstrate that the performance standards detailed within this table are achieved.
Third credit – Indoor ambient noise levels	
Criteria	Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology below.
Fourth credit – Room acoustics	
Criteria	Achieve the requirements relating to sound absorption within residential spaces and within the common spaces of the building described in the relevant building regulations or building standards national guidance.
Testing requirement	Installation of a specification compliant with the relevant building described in the relevant building regulations or building standards national guidance demonstrates compliance. A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.

Methodology

M1: Testing, measurement and calculation procedures

Where specific guidance on number of testing locations, measurement methods and calculation is not stated in the criteria tables above for the relevant building type, or within the relevant standard or guidance referenced, the following procedures can be followed by the acoustician when measuring or calculating the levels required to demonstrate compliance with this BREEAM issue.

Measurements of sound insulation (airborne and impact) should be made in accordance with the relevant part of BS EN ISO 16283(52) series, or the successor to these standards. Measurements should be conducted between one in four pairs of adjacent rooms (or teaching spaces) of each room type or performance requirements category and construction type.

Measurements of reverberation time should be made in accordance with the engineering grade (or better) requirements of BS EN ISO 3382-2:2008(53) and conducted within one in four rooms (or teaching spaces) of each room type of performance requirement category and construction type.

For measurements of ambient noise, when no specific guidance is available, the following procedures should be used:

1. Noise from both internal sources (e.g. mechanical ventilation systems, plant noise, noise-making systems) and external sources (e.g. traffic noise transmitted via the building façade) should be included. Also, where windows are openable as part of the ventilation strategy, these should be assumed to be open for the purposes of calculations and measurements. If openable windows are present but do not form part of the background or permanent ventilation strategy, then these should be assumed to be closed for the purposes of calculations and measurements.
2. Noise from occupants and office equipment (e.g. computers) should not be included in the measurements.
3. Unless otherwise stated in the specific guidance, a rate of testing of at least one in ten rooms or spaces of each performance level shall be subject to on-site performance testing.
4. Measurements should be made in at least four rooms in which noise levels can be expected to be greatest either because they are on the noisiest façade or because they are on a naturally ventilated façade.
5. Where different ventilation strategies are used, measurements should be conducted in rooms utilising each strategy. Otherwise, measurements should be made in rooms on the noisiest façade.
6. T in $L_{Aeq,T}$ is taken as the duration of the normal working day (typically 8 hours between 09.00 and 17.00).
7. Measurements need not be made over a period of 8 hours if a shorter measurement period would be suitably representative. In this case, measurements should be made when external noise levels are representative of normal conditions throughout the day.
8. Measurement periods less than 30 minutes may give representative values for indoor ambient noise levels and may be utilised where this is the case. However measurement periods shorter than 5 minutes should not be used.
9. Measurements should be taken in a minimum of three locations in rooms at a height of 1.2m above the floor level and at least 1m away from any surface.
10. The measured level of ambient noise should be used to determine compliance with the criteria for acoustically sensitive rooms. If at the time of acoustic commissioning it is not possible to measure ambient noise levels in the absence of construction or other extraneous noise sources that will not be present when the building is complete, then, for mechanical services the lower level of 35 dB, L_{Aeq} or the lowest design limit for the acoustically sensitive space should be used.

The above is intended as guidance for undertaking acoustic testing or measurement to demonstrate compliance with the performance requirements in BREEAM. If the acoustician has felt it necessary to deviate from the above procedures, they should provide a reason for doing so and confirm that the alternative procedures are adequate for demonstrating that the building meets the acoustic performance requirements.

M2: Residential institutions (short-term and long-term stay) and hospitality

Residential institution – long term stay and other residential institutions often contain a mixture of non-residential areas such as offices, small retail outlets, meeting rooms etc. and residential areas, e.g. self-contained dwellings or rooms for residential purposes. Where less than 5% of the assessed building's floor area is 'non-residential', these areas do not need to be assessed, only residential spaces are assessed against the residential criteria in Table 35 on the previous page. Where more than 5% of the assessed building's floor area includes areas other than for residential purposes, the 'non-residential' areas must meet the relevant criteria for their function for sound insulation, indoor ambient noise levels and room acoustics, as set out in the criteria for Table 34 on page 133 for 'other buildings' as well as the self-contained dwellings or rooms for residential purposes. Only include occupied spaces covered by the 'other buildings' criteria in the calculation for the percentage of 'non-residential' floor area. The 'other building' criteria should be used even when the area uses, such as offices, have their own criteria.

Compliance notes

Ref	Terms	Description
CN1	Reverberation times	Where the reverberation time required by the relevant standard is not appropriate for the type of space or building being assessed, the SQA must confirm why this is the case. In addition the SQA must set alternative appropriate reverberation times at the design stage and provide these to demonstrate compliance.
CN1.1	Remedial works	Where a programme of pre-completion testing identifies that spaces do not meet the standards, remedial works must be carried out. The remedial works should occur prior to handover and occupation and the spaces re-tested to ensure compliance. Remedial works must be carried out to all affected and potentially affected areas, including rooms or spaces of a similar construction and performance requirement that were previously untested. The test report, or covering correspondence, should include a clear statement that the testing is in accordance with the required standard (where

Ref	Terms	Description
		specified) or the BREEAM criteria and include the relevant pass or fail criteria.
CN1.2	Speech Privacy Potential	Where privacy is required or the ambient targets include a minimum as well as maximum limit, the Speech Privacy Potential (SPP) may be considered. The SPP is the sum of the weighted level difference of the partition (D_W) and the measured ambient background noise level in the receive room (L_A or NR (dBA)). To ensure the desired minimum background sound level necessary to achieve speech privacy, productivity and/or comfort goals, a sound masking system may be required. The sound masking system should be installed and in operation at the time of the acoustic testing to demonstrate compliance.
CN1.3	Programme of testing	It is not acceptable to undertake a shorter test programme due to site readiness on the day of testing. If this issue arises additional testing should be scheduled. It may be that testing at less than the typical regime identified would be acceptable in some instances. Where this is the case, clear reasoning must be provided by the compliant test body prior to awarding the credits.
CN1.4	Internal partition sound insulation criteria to internal doors	Where sound insulation criteria apply to internal partitions the calculations do need to include any doors which are part of the wall in question. While sound insulation performance of a typical door will be lower than for a typical wall, with careful design, specification and detailing, this can be overcome.
CN1.5	Mixed-use buildings	In the case of a mixed-use buildings, the Acoustic credits are adjusted to account for the credits available when this differs for the asset types present. See Guidance Note 20 (GN20) for full details. Criteria for all relevant function areas must be achieved. Where the project contains a mix of residential institutions and non-residential function areas, then the following credit scoring applies:

Non-residential credits achieved	1	2	3	
Residential institutions (short term and long-term stay) and Hospitality credits achieved	1	2	3	4
Overall credits achieved	1	2	3	4

CN1.6	Historic buildings	For historic buildings, full credits available can still be achieved where full compliance has not been met where confirmation is provided from an SQA that the design has improved the acoustic performance as much as possible taking into account the restrictions as detailed in a report from a conservation officer.
CN1.7	Residential institutions – Room acoustics	The term 'residential spaces' in the room acoustics criteria, Table 35 on page 134, refers to areas that residents can access but are not common to all visitors. Examples could include a gym and swimming pool.

Evidence

Criteria	Interim design stage	Final post-construction stage
1, 3	The relevant section of the building specification, clauses of the contract or a letter of commitment to meet the relevant acoustic performance standards, carry out all pre-completion testing using a compliant test body and complete remedial work where necessary. Where available, a report from a suitably qualified acoustician (SQA) may be used to confirm required performance standards will be achieved.	Copy of acoustic field test results to show acoustic performance standards have been achieved and evidence to support they were completed by a compliant test body.
2	Professional report or study from the acoustician confirming the bespoke acoustic	Copy of acoustic field test results to show acoustic performance standards have been

Criteria	Interim design stage	Final post-construction stage
	performance standards and testing regime. Evidence to verify that the acoustician meets the definition of a suitably qualified acoustician. The relevant section of the building specification, clauses of the contract or a letter of commitment to carry out all required pre-completion testing using a compliant test body and remedial works where necessary.	achieved and evidence to support they were completed by a compliant test body.

Definitions

Acoustically sensitive rooms

Where the term 'acoustically sensitive rooms' is referenced in this BREEAM issue, it refers to any room or space the design team or client deems to be acoustically sensitive for the purposes of privacy, which may include the following types of space or rooms (where specified):

1. Single and multiple occupancy offices.
2. Meeting, interview, consulting or treatment rooms.

In addition:

1. Educational buildings or spaces: rooms for teaching and learning, i.e. classrooms, lecture theatres.
2. Rooms used for public speaking or seminars.
3. Any other room or space the design team or client deems to be acoustically sensitive for the purposes of privacy.

Café, canteen, catering kitchen, restaurants, bars

For the purposes of the acoustic performance credit:

— Informal cafés, canteen areas, or catering kitchens are generally services provided by an organisation such as a college, factory, or company for its students or staff.

— Restaurants are places where food are served to the public on the premises. Compared to the above, restaurants can be independent and not ancillary, as per the BREEAM definition and scope.

— Bars are an establishment where soft drinks or alcoholic drinks and sometimes other refreshments are served. They might be on their own or auxiliary to other functions, e.g. hotels.

Compliant test body

A compliant test body is defined as:

1. Organisations having United Kingdom Accreditation Scheme (UKAS) accreditation to the appropriate scope (for, e.g. to BS EN ISO/IEC 17025[54]), or who are accredited by a member of the International Accreditation Forum (IAF) (www.iaf.nu) to the appropriate scope OR
2. Organisations or individuals registered with the Association of Noise Consultants (ANC) Registration Scheme OR
3. Companies or individuals that have been declared competent by an organisation who can provide evidence that they follow the relevant principles of BS EN ISO/IEC 17024 (Conformity assessment - General requirements for bodies operating certification of persons)[55] in relation to BREEAM requirements.

Groups and sub-groups

As defined in the Building Regulations for England and Wales Approved Document E: Resistance to the passage of sound, section 1 (paragraphs 1.11–1.17). For example, flats and study bedrooms are usually considered as two separate groups, and if there are significant differences in construction type then the groups will need to be broken down into sub-groups. In addition to this, where there are steps or staggers greater than 300 mm between dwellings, dwellings without steps or staggers should be treated as a different sub-group to those with steps or staggers. This is because the presence of steps or staggers is likely to improve performance.

Habitable rooms

For the purpose of this issue, habitable rooms include any room where individuals will sit or lie down and require a reasonably quiet environment in which to concentrate or rest. Such rooms are bedrooms, living rooms, dining rooms, studies as well as kitchen-dining and kitchen-living rooms.

Multiple occupancy offices

Office space that is not cellular in nature, i.e. it is open plan, and designed to accommodate more than two desk spaces or workstations.

Occupied spaces

A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user.

Room acoustics

This describes how sound behaves in an enclosed space in terms of the reverberation time (or degree of echo), overall noise levels and speech intelligibility. Room acoustics are influenced by room geometry and distribution of acoustic absorption either through the general room finishes or through the introduction of sound absorbing products.

Suitably qualified acoustician (SQA)

An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:

1. Has a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting acoustics in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.
2. Holds a recognised qualification in acoustics and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

Where an SQA is verifying the acoustic measurements or calculations carried out by another acoustician who does not meet the SQA requirements, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to:

1. Represent good industry practice.
2. Be appropriate given the building being assessed and scope of works proposed.
3. Avoid invalid, biased and exaggerated recommendations.

Additionally, written confirmation from the third-party verifier that they comply with the definition of an SQA is required.

Users with special hearing and communication needs

Users with special hearing or communication needs includes, but are not limited to, people with permanent hearing impairment or with severe or complex needs, including:

- speech, language and communication difficulties
- visual impairments
- fluctuating hearing impairments caused by conductive hearing loss
- attention deficit hyperactivity disorder (ADHD)
- an auditory processing disorder or difficulty
- being on the autistic spectrum

Such users should be considered by the suitably qualified acoustician when giving early design advice regarding room layout, sound insulation and reverberation times etc. The above is a typical list of users and is not intended to be a list of mandatory requirements.

Additional information

Law court buildings

The latest guidance for law court buildings is the Court and Tribunal Design Guide (CTDG), which is available from: www.gov.uk/government/publications/court-and-tribunal-design-guide

You need to make sure you follow the key metrics for Optimum Reverberation with the correct units (seconds). See the 'Acoustics' section in Chapter 5 of the Court and Tribunal Design Guide (CTDG).

Country-specific guidance

The following standards or building regulations are relevant for the assessment of this issue.

England
For residential institution - long term stay assessments, where the criteria refer to the performance standards in building regulations, in England, this is referring to Approved Document E 2003 edition, with amendments 2004, 2013 and 2015 – Resistance to the passage of sound.(56)

Northern Ireland
For residential institution - long term stay assessments, where the criteria refer to the performance standards in building regulations, in Northern Ireland, this is referring to - DOE Technical Booklet G - Sound 2012.

Scotland
For healthcare buildings, where the criteria refer to the use of HTM 08-01, assessments in Scotland should use SHTM 08-01.(57)

For residential institution - long term stay assessments, where the criteria refer to the performance standards in building regulations, in Scotland, this is referring to Domestic Technical Handbook 2023 – Section 5, Noise.(58)

Wales
For residential institution - long term stay assessments, where the criteria refer to the performance standards in building regulations, in Wales, this is referring to Approved Document E 2003 edition, with amendments 2004 and 2010 – Resistance to the passage of sound.

Noise rating (NR) curves

Noise assessments based on NR curves are often used by building services consultants to predict internal noise levels due to mechanical ventilation systems. However, the BREEAM requirement uses the indoor ambient noise level, $L_{Aeq,T}$ which includes external noise transmitted via the façade as well as internal noise such as that from mechanical ventilation systems. In the absence of strong low frequency noise, $L_{Aeq,T}$ can be estimated from the NR value using the following formula: $L_{Aeq,T} \approx$ NR + 6 dB. Therefore, if the NR value is known, but not the sound pressure levels in the individual frequency bands, an estimate for the indoor ambient noise level $L_{Aeq,T}$ can still be determined from the NR value for the building services noise. The $L_{Aeq,T}$ for the external noise transmitted via the façade must then be combined with the $L_{Aeq,T}$ for the building services.

Scotland
The Scottish regulations do not account for Ctr acoustic metric and therefore the BREEAM uplift for Scotland does not need to account for Ctr either.

Hea 07 Safe and accessible design

(all buildings)

Aim

To recognise measures that provide safe and secure access to and in the building.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1 + 1 exemplary	None	1–4 (see ref 1.0 and 1.1)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Accessible design** Where accessibility features in Table 36 are not applicable to the assessed area, then the individual features can be filtered out, further described in M1. For example, if the assessment does not have car parking provision, the accessibility features 1.d and 1.e in Table 36 can be filtered out of the assessment. Justification for each exclusion must be made.
1.1	**Accessible design** A minimum of two features in four sections of Table 36 must be present to target this credit. See M1.1 for full details.

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
-	None

Assessment criteria

One credit – Accessible design

1 The asset must contain at least 50% of the applicable accessibility features in any four sections of Table 36.

OR

2 The asset achieves bronze level certification from Access4you or higher.

One exemplary credit – Accessible design

3 The asset must contain at least 50% of the applicable accessibility features in any six sections of Table 36.

OR

4 The asset achieves silver level certification from Access4you or higher.

Checklists and tables

Table 36: Standard accessibility features

	Accessibility features
1. Access to the asset	a. Step-free external access (i.e. level, gentle slope or ramp) from the site boundary to the main entrance(s) or alternative accessible entrance of the asset. b. Handrails to external stepped and ramped access routes to the main entrance(s) or alternative accessible entrance of the asset. c. Entrance doors that are accessible to all users, particularly persons who use wheelchairs and those with limited physical dexterity, and are wide enough when open to allow unrestricted passage for a variety of users, e.g. those in wheelchairs, people carrying luggage, people with assistance pets, and parents with pushchairs and small children.
2. Horizontal and vertical circulation	a. Corridors and passageways that are wide enough to allow all persons to pass through unimpeded or turn in a wheelchair. b. Internal doors that are easy to operate and wide enough to allow free passage for all persons, including those in wheelchairs. c. Handrails for internal stairs, steps and ramps. d. Accessible lift(s) or vertical and inclined lifting platforms that reach all accessible levels of the asset. e. Accessible horizontal and vertical emergency evacuation routes (e.g. in the event of fire) and facilities (e.g. evacuation chairs) or a strategy and plan for assisted evacuation.
3. Use of the asset's facilities	a. Power-operated entrance door(s) (e.g. via push pad or motion sensor). b. Controls and switches (e.g. door handles and locks, taps, activation devices, electric outlets and switches, etc.) that are easy to understand and operate, visible and at a suitable height. c. Where drinking water outlets are provided for asset users, outlets are accessible to persons with disabilities including those who use wheelchairs (a minimum of one per floor for regularly occupied areas). d. Where the asset contains audience and spectator facilities, e.g. lecture and conference facilities, entertainment facilities (e.g. theatres, cinemas, etc.) and sports facilities, accessible space and seating for persons who use wheelchairs, those with mobility and sensory impairment and their companions. e. Where sleeping accommodation is provided (e.g. hotels), a proportion of the accommodation is designed for use by persons who use wheelchairs.
4. Sanitary accommodation	a. Toilet(s) with an assistance alarm accessible by those who use wheelchairs, at least one of which is a gender-neutral facility. b. Where asset users include parents or carers with young children, baby changing facilities accessible for parents or carers regardless of their gender. c. Where showers, bathrooms or changing rooms are provided for asset users, accessible versions to accommodate persons who use wheelchairs, persons with limited mobility, etc.
5. Orientation and wayfinding	a. Well-planned layouts that clearly identify key elements such as entrances, reception areas, sanitary facilities, etc. b. Good lighting conditions with additional illumination at decision points such as access routes, entrances, staircases, lifts, etc. c. Clear information and signage that is legible and easily understood, including availability in different languages where appropriate to the asset's location. d. Use of visual contrast and colour to facilitate orientation and navigation, to provide warnings about potential hazards, and to facilitate reading of information and signs. e. Provision of tactile information, e.g. embossed signage, Braille signage, tactile walking surface indicators (TWSI), tactile maps, models and plans, changes in floor surface, changes in level, tapping rails. f. Audible communication and sounds, e.g. talking signs, announcement systems, audio descriptive way-finding information, changes in walking surface. g. Use of scents or smells to provide additional orientation cues.
6. Assistive technologies	a. Hearing enhancement system(s) (e.g. induction loop) at service or reception counters and in rooms and spaces used for meetings, lectures, classes, performances, spectator sport or

	Accessibility features
	films. b. Audible information systems. c. Visual alarm systems. d. Voice or touch screen operated controls.
7. Inclusive spaces	a. All-gender and/or family sanitary accommodation. b. A Changing Places (CP) facility. c. Resting places available at regular intervals along external and internal circulation routes. d. Quiet, wellness, prayer or meditation room(s). e. Lactation room(s). f. Assistance animal relief (toilet) area(s). g. Accessible and inclusive fitness spaces and equipment. h. Spaces that promote regular informal social interactions and information exchange with different asset users.

Methodology

M1: Accessibility

M1.1: Applicability of issue

All sections and features in Table 36 are applicable to each assessment, unless filtered out in line with Assessment type specific note 1.0 and M1.2.

Not every section and feature will be relevant to an assessment. If a section contains less than two applicable features, it cannot be used, as outlined in Assessment type specific note 1.1. If there are only two applicable features in the section, then both must be present for that section to count.

If there are less then four sections applicable to the project in Table 36, then this credit is not applicable and will be filtered out.

To meet compliance, 50% of applicable features in each section must be achieved, this must always be rounded up. For example, where three features apply, the 50% requirement is rounded up, meaning two features must be met in that case.

M1.2: Filtering of features

Accessibility features can take into account new as well as existing features. The intent is to encourage accessible design from the outset, ensuring that where influence can be made this is considered. In addition, where accessible design features cannot be influenced, projects are not negatively impacted by this, with the ability to filter out features, or where there is good accessible design then the existing features can be accepted.

Whether a feature is applicable or not depends on the ability to influence the final solution and the existing elements present. This is described in two scenarios. It is the assessor's responsibility to outline which features were deemed applicable or not and provide suitable evidence to support this. This may be in the form of drawings, reports or confirming the projects detail and scope as required.

Scenario 1 – A fit out assessment

In this example, the project scope includes the fit out of two office floors, it does not cover the shell of the building and the landlord areas such as the building entrance. In this case the project scope does not cover works to the asset entrance, but if step free access to the building entrance is already present, this can meet the accessibility feature 1.a. In addition, the layout of the corridors is already built and will not change, feature 2.a in Table 36 can therefore not be influenced. There are two options, either the existing corridors are assessed to meet the requirements and can be included, or if they do not, the feature can also be removed from the list of applicable features as it is outside the scope of the assessment.

M1.3: Access4you

Access4you International is an organization that evaluates, certifies, and qualifies the accessibility of the built environment. Their self-developed criteria system consists of 1000 aspects, which are based on the usability aspects of 8+1 stakeholder groups, including people with special mobility, visual, hearing, and cognitive needs. The rating system consists of Certified location, Bronze, Silver, or Gold qualifications.

Access4you has two schemes, the design scheme which is aligned with a new construction or major refurbishment project and the building scheme which is aligned with a fit out of an existing building. The most appropriate scheme, advised by Access4you should be used.

Compliance notes

None.

Evidence

Criteria	Interim design stage	Final post-construction stage
Accessible design		
1, 3	Design drawings (including a scaled site layout plan) highlighting accessibility features and dimensions. Where required, relevant sections of the building specification.	Final construction site layout plan or equivalent and assessor site inspection report and photographic evidence to confirm provision of compliant accessibility features.
Accessible design (Access4you)		
2, 4	Relevant section or clauses of the building specification or contract. A signed and dated letter of commitment to meet the relevant criteria. And evidence of communication with Access 4you. OR Pre-certification assessment completed by Access4you	Final certification from Access4you.

Definitions

Accessibility

Provision of buildings, parts of buildings, or outdoor built environments for people, regardless of disability, age or gender, to be able to gain access to them, into them, to use them and exit from them.

Inclusive design

Approach to the design of the environment, including buildings and their surrounding spaces, and managed and natural landscapes, to ensure that they can be accessed and used by everyone.

Universal Design

Design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design. Universal Design does not exclude the need of assistive devices for particular groups or persons with disabilities where relevant. Terms such as “Universal Design”, “accessible design”, “Design for All”, “barrier-free design”, “inclusive design” and “transgenerational design” are often used interchangeably with the same meaning.

Additional information

Best practice guidance for accessible design

Due to the variation in local legislation and design practices for accessibility, usability and inclusivity, the assessment criteria do not stipulate specific design requirements, dimensions or number of each type of feature within the asset. Therefore, compliance with the criteria must be determined by the Assessor’s best judgement on what constitutes a reasonable level of provision and design of features for the type, size and number of users of the asset. Assessors may base their judgement using the following best practice guidance:

- ISO 21542:2021 Building construction - Accessibility and usability of the built environment
- BS 8300-1:2018 Design of an accessible and inclusive built environment - Part 1: External environment - Code of practice
- BS 8300-2:2018 Design of an accessible and inclusive built environment - Part 2: Buildings - Code of practice
- EN 17210:2021 Accessibility and usability of the built environment - Functional requirements
- Building for Everyone: A Universal Design Approach, Centre for Excellence in Universal Design, 2012 (http://universaldesign.ie/Built-Environment/Building-for-Everyone/)
- Americans With Disabilities Act and Architectural Barriers Act Accessibility Guidelines, United States Access Board, 2004
- Architectural Barriers Act (ABA) Standards, Department of Defense, General Services Administration and U.S. Postal Service, 2015

Alternatively, the Assessor may base their judgment using local standards where these have similar requirements to the above standards.

Principles of Universal Design

The Principles of Universal Design were developed in 1997 by a working group of architects, product designers, engineers and environmental design researchers at the North Carolina State University, with the purpose “to guide a wide range of disciplines including environments, products and communications”. The seven principles "may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments”. The seven principles are:

- Principle 1: Equitable Use – The design is useful and marketable to people with diverse abilities.
- Principle 2: Flexibility in Use – The design accommodates a wide range of individual preferences and abilities.
- Principle 3: Simple and Intuitive Use – Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
- Principle 4: Perceptible Information – The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
- Principle 5: Tolerance for Error – The design minimises hazards and the adverse consequences of accidental or unintended actions.
- Principle 6: Low Physical Effort – The design can be used efficiently and comfortably and with a minimum of fatigue.
- Principle 7: Size and Space for Approach and Use – Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Energy



Summary

This category encourages the specification and design of energy efficient building solutions, systems and equipment that support the sustainable use of energy in the building and sustainable management in the building's operation. Issues in this section assess measures to improve the inherent energy efficiency of the building, encourage the reduction of carbon emissions and support efficient management throughout the operational phase of the building's life.

Assessment issues

Ene 01 Energy and carbon performance for regulated energy uses	up to 3 credits
Ene 02 Prediction of operational energy and carbon	up to 4 credits + 1 exemplary
Ene 03 Energy monitoring	-
Ene 04 Low carbon design	-
Ene 05 Energy efficient equipment	up to 5 credits
Ene 06 Energy efficient systems	up to 9 credits
Ene 07 Flexible demand response	up to 2 credits
Ene 08 Installed controls	-

Ene 01 Energy and carbon performance for regulated energy uses

(all buildings)

Aim

To minimise the energy consumption and carbon emissions from regulated energy uses.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 3	Excellent, Outstanding	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	Only assesses the energy performance improvement attributable to new and renovated building servicing systems that are included in the scope of the fit-out project. This issue will be filtered out where no building servicing systems are included in the scope of the fit out.

Assessment criteria

Up to three credits – Calculated energy performance improvement

1 Calculate the energy performance improvement attributable to new and renovated systems that provide regulated building services using the **Asset energy calculator**.

The percentage of available BREEAM credits awarded is given in Table 37 below.

Table 37: Ene 01 EPR_{RFO} performance scale

Percentage of available credits awarded	EPR_{RFO}	Minimum standard
33%	0.3333	-
42%	0.4167	Excellent
67%	0.6667	Outstanding
100%	1.000	

Methodology

Overview

This issue measures the improvement in energy performance attributable to new and renovated systems that provide regulated building services that are included in the scope of the fit-out project.

M1: Asset energy calculator – up to three credits available

The BREEAM asset energy calculator uses a simplified steady-state modelling approach to determine the energy performance of both the fit out building and the existing building prior to fit out compared to a version of the building that has building services specification that reflect the unimproved building stock. This is referred to as the reference building.

To assess the energy performance of the fitted-out building, the existing building prior to fit out system details must be entered for all newly installed and renovated energy using systems that are included in the scope of the fit out.

The number of credits available will be reduced in proportion to estimated energy consumption for the systems that are included from the scope of the fit out.

Note: The number of credits available are calculated and reported in the BREEAM Platform once the following information has been entered about the building:

- Building services that are present in the building.
- The building types included in the assessment scope and their respective floor areas.
- The percentage of assessed floor area that is mechanically ventilated.
- For each building service, the percentage of treated floor area that is treated by building servicing systems that are included in the scope of the fit out.

This calculation is carried out within the BREEAM Asset energy calculator based on the building location and the information entered on the building types and percentage of treated floor area that is provided by in-scope systems.

The details of the building servicing systems that fall within the assessment scope must be entered into the Platform.

Note: The Platform will only display questions that are relevant based on the assessment scope.

For any in-scope systems the following questions must be answered for both the fitted-out building and the existing building prior to fit out.

M1.1: Data entry requirements

The calculation will only run when all mandatory questions that are relevant for the assessment have been entered into the BREEAM Platform, and error messages will indicate where mandatory questions have not been answered.

For fit out projects where in-scope building servicing systems are installed where none were present previously, for example a cooling system is installed as part of the fit out where previously the floor area was not cooled, for the existing building prior to fit out, details must be entered for a servicing system that meets local energy performance requirements.

The BREEAM Platform will flag an error where the total treated floor area for each servicing system (space heating, space cooling, mechanical ventilation and hot water) in the fitted-out building does not match those in the existing building.

Data entry requirements – Scoping questions

The following data must be entered before the calculation can proceed.

Within the building details section:

- Composition of the asset – asset type(s) and floor area(s) – this determines the energy consumption for reference servicing systems.

Within Ene 01 (Energy and carbon performance for regulated energy uses), the following questions must also be answered:

- Building services present.
- Percentage of floor area mechanically ventilated.

These scoping questions determine the data entry requirements.

Data entry requirements – Space heating

For each in-scope space heating system in the fitted-out building:

- Floor area served by heating system, the main generator, the efficiency or COP of the heat generator, the fuel used, whether the system is central or local and whether heat is distributed around the building by air.

Where any of the heating systems have been improved during the fit out, data must also be entered for space heating systems in the existing building prior to fit out.

The heating system data entry requirements for the existing building prior to fit out are the same as for the fitted-out building:

- For in-scope systems that have been replaced or improved, the details must be for the system that was present in the building prior to fit out.

Data entry requirements – Space cooling

For each in-scope on-site space cooling system in the fitted-out building:

- Floor area served by cooling system, the main generator, the efficiency or EER of the cooling generator, whether the system is central or local and whether cooling is distributed around the building by air.

Where any of the cooling systems have been improved during the fit out, data must also be entered for space cooling systems in the existing building prior to fit out.

The cooling system data entry requirements for the existing building prior to fit out are the same as for the fitted-out building:

- For in-scope systems that have been replaced or improved the details must be for the system that was present in the building prior to fit out.

Data entry requirements – Mechanical ventilation

Where mechanical ventilation is in-scope, enter the following data for the fitted-out building:

- % of fans with variable speed drives, % of pumps with variable speed drives, specific fan power for air handling systems, whether ductwork tests for leakage have been carried out and appropriate remedial action taken, and whether the % heat recovery where fitted.

Where any of these have been improved data must also be entered for the existing building prior to fit out.

Data entry requirements – Hot water

For each in-scope hot water system in the fitted-out building:

- Floor area served by hot water system, the main generator, the efficiency or COP of the hot water generator, the fuel used and whether the system is central or local.

Where any of the hot water systems have been improved during the fit out, data must also be entered for hot water systems in the existing building prior to fit out.

The hot water system data entry requirements for the existing building prior to fit out are the same as for the fitted-out building:

- For in-scope systems that have been replaced or improved, the details must be for the system that was present in the building prior to fit out.

Data entry requirements – Lighting

Identify the in-scope lighting types present in the fitted-out building and the % of lit floor area they light.

Where relevant for the lighting type enter the following additional information:

- % fitted with local controls that increase the power output as the light output reduces (LEDs and fluorescent lamps).
- % fittings with diffusers or shades (all lighting types except LEDs).

— % fitted with high frequency ballasts (fluorescent lamps).

Note: The total in-scope lit floor area must always add up to 100%.

Determine the % of in-scope lit floor area that is daylit, and the % of this space that is fitted with photoelectric controls and whether these are dimmable.

Determine the % of in-scope lit floor area that is occasionally occupied and the % of this space that is fitted with presence detection and whether the controls are auto off (manual on) or auto on (manual off).

Once all of the required data entry has been completed in the BREEAM Platform, the number of credits available, the EPRs (Energy Performance Ratios), and the number of credits awarded are calculated.

The number of credits available is determined by the proportion of regulated energy use that is included in the scope of the assessment.

The EPR is calculated for two energy performance metrics: energy use intensity (EUI), and carbon intensity (CI), and the overall EPR_{RFO} is calculated as the mean (arithmetic average) of the EPRs for the two energy performance metrics. The number of credits awarded is determined based on the EPR_{RFO} in accordance with Table 37.

Compliance notes

Ref	Terms	Description
CN1	No existing system or first fit-out of a building	Where a particular system is to be installed as part of the fit out, but no existing system is present, a standard or average system performance value for a new system or component should be assumed for the existing system.

Evidence

Criteria	Interim design stage	Final post-construction stage
Calculated energy performance		
1	Confirmation from the project team that the energy performance of systems and components reflects the actual performance for both the systems in the fitted-out building and in the existing building prior to fit out along with the data sources and any assumptions used.	As per interim design stage but based on the as-built specification for the refurbished building.

Definitions

Operational energy

Energy consumption for all end uses present when the building is operational except for industrial scale process loads. Operational energy includes both regulated and unregulated energy consumption.

Reference building

A hypothetical building that has the same size, shape, orientation, internal layout as the building but with fabric and building service specifications that are typical for that building type.

The reference building assumes same standard occupancy assumptions for that building type.

Regulated energy

Building energy consumption resulting from the specification of fixed building services and fittings, including space heating and cooling, hot water, ventilation, fans, pumps, and lighting that are controlled through the applicable building regulations.

See also Unregulated energy and Operational energy.

Unregulated energy

Building energy consumption resulting from building services and fittings that are not addressed by applicable building regulations.

See also Regulated energy and Operational energy.

Additional information

None.

Ene 02 Prediction of operational energy and carbon

(all buildings)

Aim

This issue encourages prediction and measurement of operational energy consumption to generate a realistic prediction of operational energy consumption and carbon emissions in use to facilitate comparison with benchmarks.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 4 + 1 exemplary	Outstanding	All (see ref 3.0)

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	This issue may be filtered out for all fit out projects. The predictive energy modelling credit is filtered out where the project includes no new or renovated in-scope energy using systems or equipment. The minimum standard for "No fossil fuels in-scope" (criterion 7) still applies.

Assessment criteria

One credit – Predictive energy modelling

1 Identify changes to all new and renovated energy using systems and equipment that are likely to affect the buildings operational energy consumption.

2 Use metered energy consumption data for the existing building and simple energy modelling to predict the operational energy consumption of the building post fit out.

Up to three credits – Predicted operational energy performance score

3 Achieve the predicted energy modelling credit (criteria 1–2).

4 Credits are awarded based on the Operational Energy Performance score for Fit Out (OEP_{FT}) as shown in Table 38 on the next page.

Table 38: Credits awarded according to OEP_{FT}

Operational energy performance score, OEP_{FT}	Number of credits
0.25	1
0.50	2
0.75	3

One exemplary credit – Commitment to measure energy consumption in-use

5 Achieve the predicted energy modelling credit (criteria 1–2).

6 The client or building occupier commits funds to pay for the in-use energy consumption to be measured by a suitably qualified energy assessor once the building reaches the occupancy threshold (see M4).

Minimum standard – No fossil fuel use by in-scope building services and equipment

7 No fossil fuels will be used by in-scope building services and equipment (see M5).

Methodology

M1: Scope

This issue applies at the building level even when the assessment zone for the fit-out project only considers part of a building.

M2: Predictive energy modelling

M2.1: Prediction of operational energy consumption

M2.1.1: Predicting energy consumption

The predicted energy consumption for the refurbished building must be estimated based on metered energy consumption data for the existing building.

Identify energy using systems and equipment that will be new, replaced or renovated that are included in the fit out project.

- Energy use for lighting not covered by building regulations.
- Energy use for lifts and escalators.
- Energy use for small power.
- Energy use for catering.
- Energy use for server rooms.
- Energy use for domestic hot water.
- Energy use for any other types of unregulated plant and equipment – e.g., commercial refrigeration, medical equipment etc.
- Energy use for industrial process load.

For each systems and items of equipment included in the scope of the fit out the resulting change in energy consumption for the building must be estimated.

The primary data source when undertaking this route is metered data from the existing building. At a minimum, a year's worth of metered data is required to complete this route.

All energy equipment and systems being installed as part of the fit-out must be identified. The impact of these changes on the metered data should then be quantified via justified assumptions or simplified energy modelling approaches. E.g., be based on differences in typical benchmarks, simplified engineering calculations, data from similar projects, manufacturer's data, or on any other reasonable assumptions.

These calculations may be carried out by a member of the project team with previous experience or by a suitably qualified energy modeller.

The annual operational energy consumption of the refurbished building is calculated from metered energy consumption for existing building, plus the estimated energy consumption for all newly installed or refurbished systems, components and equipment, minus the energy consumption for all existing systems, components and equipment that are replaced or refurbished.

$$OEC_{refurb} = OEC_{existing\ metered} + \sum \text{annual energy consumption all new/refurbished systems} - \sum \text{energy consumption all existing systems replaced}$$

Where:

OEC_{refurb} = Operational energy consumption of the refurbished building

$OEC_{existing\ metered}$ = Operational energy consumption of the existing building based on metered data

Where the building occupancy patterns will change post fit out then the impact of these changes on the fitted out building must also be estimated.

This determines the annual operational energy consumption for the fitted out building.

M3: Predicted operational energy score

The operational energy performance metrics are then compared to BREEAM benchmark values for energy use intensity (EUI) in kWh/m² and carbon intensity (CI) in $kgCO_2e/m^2$ for the relevant building type.

M3.1: Calculating the predicted operational energy score

The annual predicted energy consumption for all operational energy uses in the building, except for industrial process loads, must be entered into BREEAM Platform for each of the following energy sources:

- Grid supply electricity
- Natural gas
- Burning oil/kerosene
- Gas oil
- Fuel oil
- Diesel
- Petrol
- LPG
- Other petroleum gas
- Coal
- Biodiesels
- Landfill gas
- Other biogas
- Wood
- Renewable heat source or renewable cooling source
- District heating
- District cooling
- Renewable electricity generated on site
- Renewable electricity generated on site and exported from the building

For buildings with district heating or cooling the carbon emission factor for the system must also be entered.

The energy use intensity (EUI) is calculated in the BREEAM Platform based on the energy consumption data entered and the floor area of the building. The EUI includes all energy sources used by the building, including renewable energy generated onsite. Net annual exports of renewable energy that are exported e.g., renewable electricity generated onsite and exported to the grid, may be excluded.

The carbon intensity (CI) is calculated in the BREEAM Platform using the appropriate carbon emission factors for each energy source and the floor area of the building.

An Operational Energy Performance score is determined relative the building benchmarks for both EUI (OEP_{EUI}) and CI (OEP_{CI}) for the building.

To account for different building use areas within a single building up to 5 building use types and floor areas may be entered into the BREEAM Platform. This is used to calculate a building specific benchmark within the BREEAM Platform.

The overall Operational Energy Performance score (OEP_{FT}) is calculated as follows:

$$OEP_{FT} = 0.5 \times OEP_{EUI} + 0.5 \times OEP_{CI}$$

M3.2: Calculating the carbon emission factor for district heating or cooling systems

The carbon emissions factor for district heating or cooling ($EF_{DH/DC}$) must be calculated on an annual basis as follows:

$$EF_{DH/DC} = (kgCO_2e_{generation} + kgCO_2e_{distribution}) / kWh_{heat/cooling}$$

Where:

- $kgCO_2e_{generation}$ = Annual carbon emissions from all energy sources used to generate heat or cooling. This is calculated from the energy used to the generate all heat or cooling multiplied by the respective emissions factors.
- $kgCO_2e_{distribution}$ = Annual carbon emissions from all energy sources used to distribute heat or cooling to final users. This is calculated from the energy used to distribute all heat or cooling multiplied by the respective emission factors.
- $kWh_{heat/cooling}$ = Annual kWh of heat or cooling delivered to all final users.

For existing systems this should be based on the most recent 12 month of operation and for new plant based on engineering calculations.

M3.3: Carbon emission factors for electricity and heat from combined heat and power

Electricity consumed by the building that is generated from combined heat and power is assigned the grid supply emission factor and should be entered into the BREEAM Platform as such.

The carbon emission factor for heating from a combined heat and power plant ($EF_{CHPheat}$) must be calculated on an annual basis as follows:

$$EF_{CHPheat} = ((kgCO_2e_{generation} + kgCO_2e_{distribution}) - (kWh_{electricity} \times EF_{electricity})) / kWh_{CHPheat}$$

Where:

- $kgCO_2e_{generation}$ = Annual carbon emissions from all energy sources used to generate heat and power calculated from the sum of energy used multiplied by their respective emissions factors.
- $kgCO_2e_{distribution}$ = Annual carbon emissions from all energy used to distribute heating to final users calculated from the energy inputs used to distribute the heat multiplied by their respective emission factors.
- $kWh_{electricity}$ = Annual kWh of electricity delivered to final users.
- $kWh_{CHPheat}$ = Annual heat delivered to all final users.
- $EF_{electricity}$ = Emission factor for grid supply electricity ($kgCO_2e/kWh$).

Where the calculation results in a negative emission factor an emission factor of zero must be entered into the BREEAM Platform.

For existing systems this should be based on the most recent 12 months of operation. For new plant this should be based on engineering calculations.

M4: Commitment to measure in-use energy consumption

The funding for in-use energy consumption measurement must be sufficient to cover monitoring of energy consumption for the first 12 months of normal occupancy (≥ 80% full occupancy) for all relevant end uses and compare these to the predicted energy consumption and any energy targets set for the building.

This could be demonstrated by undertaking a BREEAM In-Use assessment of operational energy.

Where the building will be sold or let a green lease agreement must include clauses that guarantee access to energy consumption data once the building is occupied.

M5: No fossil fuel use by in-scope building services and equipment

This applies to all building services and equipment that are included within the scope of the fit-out project. Fossil fuel for the following uses may be excluded:

- Industrial scale process loads.
- Emergency and life safety systems such as those for firefighting, evacuation, or back-up power for safety-critical systems and equipment, or within healthcare settings.
- Essential back-up systems serving buildings with functions where it is essential to maintain their continuous use, particularly in response to a disaster, for example hospitals, fire stations, police stations and emergency vehicle garages.
- Essential back-up systems serving data centres.
- Testing purposes within laboratory settings.

Compliance notes

None.

Evidence

Criteria	Interim design stage	Final post-construction stage
Predictive energy modelling		
1–2	A report containing: — Data showing energy use over a year's operation in the existing building. — A quantification of changes to regulated and unregulated energy uses as a result of the fit out and the justification for these numbers. — The predicted annual operational energy consumption in use by fuel type based on the results.	Updated report to account for any changes to the building specification, where required.
Predicted operational energy performance score		
4	Results of the predictive energy modelling confirming the predicted operational energy consumption for all energy uses. Where appropriate, calculations showing how the carbon emission factor for district heating and district cooling have been determined.	Updated energy modelling report to account for any changes to the building specification, where required. Where appropriate, calculations showing how the carbon emission factor for district heating and district cooling have been determined.
Commitment to measure energy consumption in-use		
6	Commitment from the client that funds will be available to pay for the in-use energy consumption to be measured by a suitably qualified energy assessor.	Confirmation from the client that funds have been committed and how the requirements will be met. Identify the assessor or assessment scheme that will be used. A signed contract for the scope of work with the person or organisation who will be carrying out the assessment. Evidence to support that the appointed person meets the definition of a suitably qualified energy assessor. Where applicable, clauses in the green lease agreement that guarantee access to in-use energy consumption data.
No fossil fuel use by in-scope building services and equipment		

Criteria	Interim design stage	Final post-construction stage
7	Design drawings, relevant section of the building specification, contract clauses or letter of confirmation from the project team which demonstrates that no fossil fuels will be used by services and equipment that is included in the scope of the fit-out project.	Final construction drawings or equivalent, assessor site inspection and photographic evidence or other supporting documentation to show that no fossil fuels are being used by services and equipment that is included in the scope of the fit-out project.

Definitions

Combined heat and power

The concurrent production of electricity or mechanical power and useful thermal energy (heating and/or cooling) from a single source of energy.

Green lease

A green lease is a contract that includes additional clauses which provide for the management and improvement of the environmental performance of a building by both owners and occupiers.

To be acceptable for BREEAM a green lease agreement must cover all relevant BREEAM requirements and must be signed by both the lessor and the lessee or, a where the lessee is unknown, a commitment must be provided by the client that the green lease agreement will be implemented when the building is occupied.

Industrial scale process loads

The energy used during manufacturing, production, waste treatment or other industrial processes (for example, chemical, physical, electrical, or mechanical processes during the production or manufacture of products).

The energy may be used for activities such as heating, cooling, mechanical work, chemical reactions, and other operations essential for the transformation of raw materials into finished products or goods.

Operational energy

Energy consumption for all end uses present when the building is operational except for industrial scale process loads. Operational energy includes both regulated and unregulated energy consumption.

Regulated energy

Building energy consumption resulting from the specification of fixed building services and fittings, including space heating and cooling, hot water, ventilation, fans, pumps, and lighting that are controlled through the applicable building regulations.

Suitably qualified energy assessor

An individual who:

— Has experience of carrying out energy audits or in-use energy performance assessments in accordance with legislation or voluntary measurement and reporting standards.

OR

— Has accreditation from a suitable and recognised scheme certifying that they are qualified to assess the energy efficiency of buildings.

Third party

"A person or body that is recognised as being independent of the parties involved, as concerns the issue in question" (BS EN 15804:2012+A1:2013).

The suitably qualified energy modelling engineer or accredited professional third-party verifier must be independent of the energy modeller who created the model and demonstrate impartiality (for general principles, see ISO 17029). To qualify as a third party, the verifier must belong to an organisation not involved in the project and must not provide advice to the project, as this could compromise their impartiality during verification.

Unregulated energy

Building energy consumption resulting from building services and fittings that are not addressed by applicable building regulations.

Additional information

None.

Ene 03 Energy monitoring

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Ene 04 Low carbon design

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Ene 05 Energy efficient equipment

(all buildings)

Aim

To recognise and encourage the procurement of energy efficient equipment to minimise energy consumption and carbon emissions in operation.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 5	None	All (see ref 3.0)

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	This issue is filtered out where there is no "in-scope" equipment present.

Assessment criteria

Up to five credits – Energy efficient equipment

1 Identify items of equipment in the project specification (in-scope equipment) that are users of unregulated energy (see M1).

2 Estimate the expected annual energy consumption by the in-scope equipment identified in criterion 1 (see M2).

3 Determine the ratio of in-scope unregulated energy use by equipment to regulated energy use to determine the number of credits available (see Table 39 below and M3).

Table 39: Energy efficient equipment credits available

In-scope unregulated energy use by equipment / regulated energy use (%)	Credits available
No in-scope equipment OR Energy consumption of in-scope equipment is not significant	Issue filtered out
< 10%	1
≥ 10% and < 20%	2
≥ 20% and < 30%	3
≥ 30% and < 40%	4
≥ 40%	5

4 Determine which in-scope equipment items are energy efficient (see M4).

The number of credits awarded is proportional to the percentage of energy use by in-scope equipment that uses energy efficient equipment as follows:

Number of credits = (% of in-scope equipment that is energy efficient × number of credits available) rounded to the nearest whole number.

Methodology

M1: Scope of unregulated energy using equipment

Any equipment that is newly installed, refurbished, or renovated that falls within the scope of the fit-out project is to be included in the assessment unless one or more of the following conditions apply:

1. They are part of an industrial process.
2. They provide temporary services e.g., external lighting for theatrical, stage, and local display installations.
3. They are only used when maintenance work is being carried out.
4. They are only used in an emergency.
5. There are overriding safety, security or accessibility requirements that prevent energy efficiency criteria being met by any relevant compliance routes.
6. Reused equipment (that was not previously used in the building) is used in place of new equipment (due to the reduction in embodied carbon).
7. The equipment is mobile and is likely to be used outside of the building (for example, laptop computers).
8. The equipment is a bespoke (unique) item that has been made specifically for the project and cannot be compared to standard equipment.

Energy using equipment **may** be excluded from the assessment where the additional cost of procuring more energy efficient equipment is expected to exceed the cost savings from reduced energy consumption over the lifetime of the equipment. This is more likely to be the case for items with low annual energy consumption. As a guide this is likely to occur where the expected annual energy consumption of equipment is lower than 100 kWh per year, which equates to a small domestic refrigerator.

All other in-scope energy using systems must be included in the assessment.

M2: Estimating energy use by in-scope equipment

Energy consumption estimates may be derived from simple energy modelling results, benchmarks, data for similar projects, engineering calculations (see simple example of an engineering calculation below), or other appropriate estimation methods. Where the system is an existing system, previous metered data can be used to determine the annual energy consumption for that system.

$$\text{kWh per year} = \text{kW rating} \times \text{Load factor} \times \text{Annual use hours}$$

where:

kW rating = Maximum power consumption of the equipment.

Load factor = Average power consumption when the equipment is in use/kW rating.

The estimated annual energy consumption for each type of in-scope equipment must be entered into the BREEAM Platform.

At the pre-assessment stage the number of credits available may be estimated by entering a rough estimate of the total energy consumption for all in-scope equipment. This must be replaced by estimates of the energy consumption for each item of equipment before the assessment is submitted.

M3: Determining the number of credits available

The methodology for calculating the annual energy consumption for in-scope energy using equipment is described in M2.

Regulated energy use should be estimated based on measured energy consumption data for the existing building, adjusted to take account of any change in energy consumption due to the refurbishment. Alternatively, energy modelling results e.g., for Ene 02 or estimates from data for similar projects or benchmarks may be used.

In all cases the annual regulated energy must be entered into the BREEAM Platform and is used to determine the ratio of in-scope equipment to regulated energy use as follows:

$$\frac{Annual\ energy\ consumption\ for\ all\ in-scope\ equipment}{Annual\ energy\ consumption\ for\ regulated\ end\ uses} \times 100\%$$

This is used to determine the number of credits available according to Table 39 on page 160.

M4: Demonstrating energy efficiency

There are two routes for demonstrating that equipment is energy efficient:

1. Where the equipment is more energy efficient than that of a standard item of equipment (see M4.1).
2. Where the equipment meets specific "deemed to comply" energy efficiency requirements (see M4.2).

Deemed to comply energy efficiency requirements are only provided for some types of equipment.

Where deemed to comply requirements exist, the energy efficiency compared to a standard version of the equipment may still be used to demonstrate compliance for this issue.

M4.1: Demonstrating energy efficiency compared to a standard version of the equipment

A standard version of equipment is defined as having an energy performance that is typical and only has energy efficient features that are common for that type of equipment.

The performance of a standard version of equipment might be determined based on a non-exhaustive search for products of the same type.

To demonstrate that the actual equipment procured is more energy efficient than the standard version of equipment, it must be demonstrated that the energy performance of the actual equipment achieves a meaningful reduction in energy consumption compared to the standard version.

Where technical data on both the actual and standard version of the equipment is readily available, this should be used to calculate the percentage reduction in energy consumption. This calculation, alongside justification for both the selection of the standard product and the acceptance of the achieved percentage reduction over the standard product as meaningful, should be provided in each case to demonstrate that a given item of equipment is energy efficient.

Note: The percentage reduction in energy consumption does not impact the number of credits awarded.

M4.2: Deemed to comply energy efficiency requirements for equipment

Energy labelling and listing schemes that are deemed to comply with the energy efficiency requirements for this issue are listed in Table 40 below.

Table 40: Deemed to comply requirements for energy labelling and listing schemes

Equipment	Labelling scheme or list	Requirement
All equipment types	ENERGY STAR® (United States Environmental Protection Agency)(1)	Certified
	Energy Technology List (UK Government)(2)	Listed
Fridges	EU Energy Efficiency Labelling Scheme (March 2021)(3)	E or above
	Energy Rating label (Australian Government)(4)	3.5 stars or above
Fridge freezers	EU Energy Efficiency Labelling Scheme (March 2021)	E or above
Freezers	EU Energy Efficiency Labelling Scheme (March 2021)	D rating or above
	Energy Rating label (Australian Government)	3.5 stars or above

1 https://www.energystar.gov/products

2 https://etl.energysecurity.gov.uk/products

3 https://eprel.ec.europa.eu

4 https://calculator.energyrating.gov.au

Equipment	Labelling scheme or list	Requirement
Washing machines	EU Energy Efficiency Labelling Scheme (March 2021)	B rating or above
	Energy Rating label (Australian Government)	4 stars or above
Washer dryers	EU Energy Efficiency Labelling Scheme (March 2021)	D rating or above
Tumble dryers	EU Energy Efficiency Labelling Scheme (March 2021)	D rating or above
Room air conditioners	EU Energy Efficiency Labelling Scheme (original)	B or above
Computer monitors	EU Energy Efficiency Labelling Scheme (March 2021)	D rating or above
	Energy Rating label (Australian Government)	6 stars or above
Dishwashers	EU Energy Efficiency Labelling Scheme (March 2021)	C rating or above
	Energy Rating label (Australian Government)	3.5 stars or above
TVs	EU Energy Efficiency Labelling Scheme (March 2021)	E rating or above
	Energy Rating label (Australian Government)	5 stars or above

M4.3: Other energy labelling schemes and energy efficiency list

Other energy labelling schemes and energy efficiency criteria are recognised where it can be demonstrated by the assessor that the scheme or criteria:

1. Are nationally or regionally recognised.
2. Effectively identify energy efficient products.
3. Are independently managed and operated by governments or other independent bodies.

Where other energy labelling schemes or energy efficiency criteria are used, the assessor must confirm that the labelling scheme or list meets these requirements.

M5: Determining the number of credits achieved

The total annual energy consumption of in-scope equipment is determined based on the estimated energy consumption data entered in the BREEAM Platform, as described in M2.

Where equipment is demonstrated to be energy efficient in accordance with M4 this should be indicated in the BREEAM Platform.

The number of credits achieved is calculated in the BREEAM Platform as follows:

$$\frac{\textit{Annual energy consumption by in-scope equipment that is energy efficient}}{\textit{Annual energy consumption from in-scope equipment}} \times \textit{Number of credits available}$$

Partial credits are rounded to the nearest whole number.

Compliance notes

Ref	Terms	Description
CN1	Design team lacks relevant specialist knowledge	Where the design team lack the relevant specialist knowledge, calculations and analysis may be carried out by specialist contractors, manufacturers, suppliers, or installers. The assessor must be satisfied that the analysis has been carried out correctly and compliant evidence provided.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Design drawings, relevant sections of the building specification, equipment schedules or other documentary evidence identifying all proposed in-scope equipment.	Updated documentation or correspondence identifying the unregulated energy using systems that are included within the project specification, assessor site inspection report, photographic evidence or other documentary

Criteria	Interim design stage	Final post-construction stage
	Where items with low annual energy consumptions have been excluded from the scope due to the cost of replacement, this must be stated and justified.	evidence to verify the unregulated energy using systems that have been installed. Where items with low annual energy consumptions have been excluded from the scope due to the cost of replacement, this must be stated and justified.
2	Calculations to show the estimated energy consumption for all in-scope equipment.	Updated calculations to account for any changes to the building specification.
3	Where not automatically calculated from Ene 02, supporting data to confirm regulated energy consumption values. Calculations used to determine the operational energy consumption for the building.	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
4	Where compliance demonstrated by comparison to a standard version of the equipment, acceptable evidence sources include: — Written justification for the selection and benchmarking of the standard product based on reasonable assumptions or basic market research. — Specific clauses from reports or manufacturer's literature relating to the energy performance of the actual product. — Specific clauses from reports or manufacturer's literature relating to the energy performance of the standard product. Plus: — Where available, calculations showing that the actual product is more energy efficient than the standard product. Where a percentage reduction in energy consumption has been accepted as signifying a meaningful reduction in energy efficiency, then this should be stated and justified. Where this is demonstrated by meeting the deemed to comply energy labelling schemes and lists, acceptable evidence sources include: — Relevant section of the building specification, equipment schedules or contract clauses. — Where products are specified, manufacturer's literature or copy of the energy rating label, indicating the energy labelling scheme and the rating achieved. AND In addition to the above, where this is demonstrated by meeting other energy efficient	Where compliance is demonstrated by comparison to a standard version of the equipment, acceptable evidence sources include: — Manufacturer' literature relating to the energy efficiency of the actual installed equipment. — Final construction drawings/equipment schedules or equivalent, assessor site inspection report and photographic evidence or proof of purchase to verify installed products or equipment. Plus: — Calculations showing that the actual product is more energy efficiency than the standard product. Where a percentage reduction in energy consumption has been accepted as signifying a meaningful reduction in energy efficiency, then this should be stated and justified. Where compliance is demonstrated by meeting the deemed to comply energy labelling schemes and lists, acceptable evidence sources include: — Final construction drawings/equipment schedules or equivalent, assessor site inspection report and photographic evidence or proof of purchase to verify installed products or equipment. — Manufacturer's literature or copy of the energy rating label, indicating the energy labelling scheme and the rating. AND In addition to the above, where this is demonstrated by meeting other energy efficient labelling schemes or energy efficiency listings, confirmation that the energy efficient labelling scheme or listing is:

Criteria	Interim design stage	Final post-construction stage
	labelling schemes or energy efficiency listings, confirmation that the energy efficient labelling scheme or listing is: — Nationally or regionally recognised. — Effectively identifies energy efficient products.	— Nationally or regionally recognised. — Effectively identifies energy efficient products.

Definitions

Energy using equipment

A standalone item of machinery that can perform its intended function without additional components or controls.

Energy using equipment is assessed in this issue (Ene 05).

Energy using system

Machinery that consists of multiple components that must be connected and configured to perform its intended function.

Energy using systems are assessed in Ene 06.

Regulated energy

Building energy consumption resulting from the specification of fixed building services and fittings, including space heating and cooling, hot water, ventilation, fans, pumps and lighting that are generally controlled through the applicable building regulations and are included in the scope of the Ene 01 assessment.

Unregulated energy

Building energy consumption resulting from building services and fittings that are not generally covered by building regulations and are not included in the scope of the Ene 01 assessment.

Additional information

Worked example of credits available and credits awarded

In-scope equipment are fridges, servers, and computer monitors.

Regulated energy consumption is 7000 kWh per year.

The estimated energy consumption for in-scope equipment is estimated to be:

— Fridges: 700 kWh per year

— Servers: 1400 kWh per year

— Computer monitors: 300 kWh per year

$$\frac{\textit{Unregulated energy use}}{\textit{Regulated energy use}} = \frac{2400}{7000} \times 100 = 34.29\% = 4\ \textit{credits available}$$

Of the in-scope equipment, the fridges and the computer monitors are deemed to be energy efficient, but the servers are not.

Percentage of energy consumption for in-scope equipment that meet the requirements is:

$$\left(\frac{700 + 300}{700 + 300 + 1400}\right) \times 100 = 41.66\%$$

0.4166 × 4 = 1.67 = 2 credits achieved (out of 4 credits available)

Note that this calculation procedure is provided for information only. The credits available and awarded will be determined within the BREEAM Platform based on data entered into the system.

Ene 06 Energy efficient systems

(all buildings)

Aim

To recognise and encourage the procurement of energy efficient systems to minimise energy and carbon emissions in operation.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 9	None	All (see ref 3.0)

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	This issue is filtered out where there are no "in-scope" systems present.

Assessment criteria

Up to nine credits – Energy efficient systems

1 Identify systems in the project specification (in-scope systems) that are users of unregulated energy (see M1).

2 Estimate the expected annual energy consumption by in-scope systems identified in criterion 1 (see M2).

3 Determine the ratio of in-scope unregulated energy used by systems to regulated energy use to determine the number of credits available (see Table 41 below and M3).

Table 41: Credits available

In-scope unregulated energy using systems / regulated energy use	Credits available
No in-scope equipment OR Energy consumption of in-scope systems is not significant	Issue filtered out
< 10%	1
≥ 10% and < 20%	2
≥ 20% and < 30%	3
≥ 30% and < 40%	4
≥ 40% and < 50%	5

In-scope unregulated energy using systems / regulated energy use	Credits available
≥ 50% and < 60%	6
≥ 60% and < 70%	7
≥ 70% and < 80%	8
≥ 80%	9

4 Determine in-scope systems that are energy efficient (see M4).

The number of credits awarded is proportional to the percentage of energy use by in-scope systems that uses efficient systems as follows:

Number of credits = (% in-scope systems that are energy efficient × number of credits available) rounded to the nearest whole number.

Methodology

M1: Identifying in-scope unregulated energy using systems

Any systems that are newly installed, refurbished, or renovated that fall within the scope of the fit-out project are to be included in the assessment unless one or more of the following conditions apply:

1. They are part of an industrial process.
2. They provide temporary services e.g., external lighting for theatrical, stage, and local display installations.
3. They are only used when maintenance work is being carried out.
4. They are only used in an emergency.
5. There are overriding safety, security or accessibility requirements that prevent energy efficiency criteria being met by any relevant compliance routes.
6. Reused systems and components (that were not previously used in the building) that are used in place of new systems (due to the reduction in embodied carbon).
7. The system is a bespoke (unique) item that has been made specifically for the project and cannot be compared to standard systems.

Energy using systems **may** be excluded from the assessment where the additional cost of procuring more energy efficient system is expected to exceed the cost savings from reduced energy consumption over the lifetime of the system. This is more likely to be the case for systems with low annual energy consumption.

All other energy using systems that fall within the scope of the assessment must be included.

M2: Estimating energy use by in-scope systems

Energy consumption estimates may be derived from simple energy modelling results (including NCM calculations), benchmarks, data for similar projects, engineering calculations (see equation below), or other appropriate estimation methods. Where the system is an existing system, previous metered data can be used to determine the annual energy consumption for that system.

$$\text{kWh per year} = \text{kW rating} \times \text{Load factor} \times \text{Annual use hours}$$

where:

kW rating = Maximum power consumption of the system

Load factor = Average power consumption when the system is in use/kW rating

The estimated annual energy consumption for each type of in-scope system must be entered into the BREEAM Platform.

At the pre-assessment stage the number of credits available may be estimated by entering a rough estimate for energy consumption for all in-scope systems but will need to be replaced by energy estimates for each in-scope system before the assessment is submitted.

M3: Determining the number of credits available

The methodology for calculating the annual energy consumption for in-scope energy using systems is described in M2.

Regulated energy use should be estimated based on measured energy consumption data for the existing building, adjusted to take account of any change in energy consumption due to the refurbishment. Alternatively, energy modelling results e.g., for Ene 02 or estimates from data for similar projects or benchmarks may be used.

In all cases the annual regulated energy consumption must be entered into the BREEAM Platform and is used to determine the ratio of in-scope systems to regulated energy use as follows:

$$\frac{\textit{Annual energy consumption for in - scope systems}}{\textit{Annual energy consumption for regulated end uses}} \times 100\%$$

This is used to determine the number of credits available according to Table 41 on page 167.

M4: Demonstrating energy efficiency

There are two routes for demonstrating that a system is energy efficient:

1. Where the system is more energy efficient than that of a standard version of the system (see M4.1).
2. Where the systems meet specific "deemed to comply" energy efficiency requirements (see M4.2).

Deemed to comply energy efficiency requirements are only provided for some types of systems.

Where deemed to comply requirements exist, the energy efficiency compared to a standard version of the system may still be used to demonstrate compliance for this issue.

M4.1: Demonstrating energy efficiency compared to a standard version of the system

A standard system is defined as being a system that:

1. Has energy using components with energy efficiency levels that are typical for the component types.
2. Has not been designed to optimise energy consumption.
3. Has only energy efficient features and controls that are typical for the system type.

The performance of a standard version of a system might be determined based on a non-exhaustive search for systems of the same type.

To demonstrate that the actual version of the system procured is more energy efficient than a standard version of the system, it must be demonstrated that the energy performance of the actual system achieves a meaningful reduction in energy consumption compared to a standard version.

Where technical data on both the actual and standard version of the system is readily available, this should be used to calculate the percentage reduction in energy consumption. This calculation, alongside justification for both the selection of the standard product and the acceptance of the achieved percentage reduction over the standard product as meaningful, should be provided in each case to demonstrate that a given system is energy efficient.

Note: The percentage reduction in energy consumption does not impact the number of credits awarded.

M4.2: Deemed to comply energy efficiency requirements for systems

This is an alternative compliance route that is available for the following types of system:

- External lighting
- Cold storage
- Lifts and escalators
- Swimming pools
- Commercial laundries
- Cooling systems in server rooms

These system types do not have to meet the deemed to comply requirements and, may instead demonstrate that the actual system is more energy efficient than a standard version of the system (see M4.1).

M4.2.1: External lighting systems

M4.2.1.1: Deemed to comply requirements for external lighting systems

The deemed to comply requirements for external lighting systems are set out in Table 42 below.

Table 42: Deemed to comply requirements for external lighting systems

Ref	Requirements for external lighting systems
1	The average initial luminous efficacy across all in-scope external lighting systems within the construction zone achieves ≥ 70 luminaire lumens per circuit watt.
2	All external light fittings are automatically controlled to prevent operation during daylight hours and are fitted with presence detection in areas of intermittent pedestrian traffic.

Average initial luminous efficacy is calculated as the individual luminous fluxes of all luminaires within the construction zone summed (in lumens), then divided by the total circuit watts for all the luminaires.

The luminous flux of a luminaire is calculated as follows:

$$\frac{\sum_{all\ luminares}(Luminous\ flux\ lamp \times Light\ output\ ratio\ luminare)}{\sum_{all\ luminares} Total\ circuit\ watts}$$

Note: LED lighting typically has integral luminaires.

M4.2.2: Cold storage systems

M4.2.2.1: Scope of cold storage systems

This covers freezer or cold storage rooms which are integral to the building and includes cooling systems that require commissioning and optimisation for the specific requirements of the cold storage space. This applies whether the cold storage space has a dedicated cooling system serving this space, or one which is connected to wider building cooling services.

Commercial-sized, but self-contained, off-the-shelf cold storage system units such as large freezers, fridges, or stand-alone self-contained walk-in cold storage units that are manufactured as a self-contained product, and contain their own integral cooling systems, that operate according to manufacturer pre-sets, and do not require commissioning of the cooling system should be assessed under Ene 05 Energy efficient equipment.

M4.2.2.2: Deemed to comply requirements for cold storage systems

The deemed to comply requirements for cold storage systems are set out in Table 43 below.

All relevant requirements must be met for the system to be deemed energy efficient.

Table 43: Deemed to comply requirements for cold storage systems

Ref	Requirements for cold storage systems
1	**Energy efficient components** Where the following components are included, they must meet with the requirements of independent external labelling or listing criteria: 1. Air-cooled condensing units 2. Cellar cooling system 3. Evaporative condensers 4. Packaged chillers 5. Refrigeration compressors 6. Refrigeration system controls Note: The energy technology list sets out energy efficiency criteria for these components (etl.energysecurity.gov.uk/products/refrigeration-equipment).
2	**Designed to minimise heat loss** Demonstrate the following: — High levels of insulation

Ref	Requirements for cold storage systems
	— Reduced air infiltration
3	**Controls to optimize temperature, humidity, and airflow management** This can be achieved by installing central automatic controls that include anti-tamper controls, automatic lighting controls, fixed set-point temperature and temperature dead bands.
4	**System will undergo commissioning and testing** The refrigeration system has been commissioned in compliance with criterion 7 in Man 04 Commissioning and handover. This does not require the 'Commissioning' credit to be awarded. Note: Documentation of the test and commissioning procedures relevant to the installation, such as pressure testing, leakage testing and validation to specification must be provided.

M4.2.3: Lifts and escalators

M4.2.3.1: Scope of lifts and escalator

This compliance route may be used for any lifting device with a rated speed > 0.15 m/s, inclusive of goods lifts, vehicle lifts, and passenger lifts.

M4.2.3.2: Deemed to comply requirements for lift and escalators

The deemed to comply requirements for lifts and escalators are set out in Table 44 below.

All relevant requirements must be met for the system to be deemed energy efficient.

Table 44: Deemed to comply requirements for lifts and escalators

Ref	Requirements for lifts and escalators
1	Undertake a transport analysis to determine the number and size of lifts, escalators or moving walkways that are needed to meet the expected transport demand and usage patterns has been determined and minimised.
2a	For lifts, the energy consumption for a standard system and the actual system have been estimated in accordance with ISO 25745 Energy performance of lifts, escalators and moving walks: — Part 2: Energy calculation and classification for lifts (elevators).
2b	For escalators and moving walkways, the energy consumption for a standard system and the actual system have been estimated in accordance with ISO 25745 Energy performance of lifts, escalators and moving walks: — Part 3: Energy calculation and classification for escalators and moving walks.
3a	The lifts have achieved energy efficiency class A under ISO 25745. OR The following measures are incorporated into the lifts where applicable: 1. Regenerative drives. 2. The lifts operate in a standby condition when the lift has been idle for a prescribed length of time. 3. All lift car lighting, digital signage, and electronic displays have an efficiency of ≥ 70 lamp lumens per circuit watt. 4. Drive controllers capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor or, other type of drive providing equivalent optimal energy efficiency.
3b	The escalators or moving walkways have achieved energy efficiency class A+++ under ISO 25745. OR The following measures are incorporated into the escalators or moving walkways where applicable: 1. Load sensing devices that synchronise motor output to passenger demand through a variable speed drive, with an inverter operating full-time to moderate output based on passenger demand. OR 2. Passenger sensing devices for automated operation (auto walk), so the escalator operates in standby mode when there is no passenger demand.
4	When following the “measures” route for 3a or 3b, a suitably qualified member of the project team must confirm the measures have been included in the specification or justify why they are not applicable. For example, because it not technically feasible, or because the additional cost or impact on embodied carbon is unlikely to pay back over the lifetime of the system.

M4.2.4: Swimming pools

The deemed to comply requirements for swimming pools are set out in Table 45 on the next page.

All relevant requirements must be met for the system to be deemed energy efficient.

Table 45: Deemed to comply requirements for swimming pools

Ref	Requirements for swimming pools
1	Pool pumps must have variable speed drives.
2	Pool heating systems must be energy efficient, for example using heat pumps or heat from on-site renewable energy sources.
3	Automatic or semi-automatic pool covers, or 'liquid' pool covers with an automatic dosing system, are fitted to entire pool surface area for ALL pools, including spa pools and hot tubs (if relevant).
4	The air temperature in the pool hall can be controlled so that it is 1°C above the water temperature.

M4.2.5: Commercial laundries

The deemed to comply requirements for commercial laundries which include commercial sized appliances are set out in Table 46 below.

All relevant requirements must be met for the system to be deemed energy efficient.

Table 46: Deemed to comply requirements for commercial laundries

Ref	Requirements for commercial laundries
1	Heat recovery from waste-water is fitted to all appliances.
2	Greywater is used for part of the washing process. This may be recycled from the final rinse and used for the next pre-wash.

M4.2.6: Cooling systems in server rooms

The deemed to comply requirements for cooling servers in server rooms are set in Table 47 below.

All relevant requirements must be met for the system to be deemed energy efficient.

Table 47: Deemed to comply requirements for cooling systems in server rooms

Ref	Requirements for cooling systems in server rooms
1	Cooling is provided by natural or forced ventilation. Active cooling may only be used when the internal temperature cooling in server rooms is designed to meet the widest allowable operating conditions as defined in the ASHRAE temperature classes (or local / national equivalent) to minimise cooling loads. These operating conditions must consider the type of servers which will be installed, and how they will be operated. A suitably qualified specialist justifies the operating conditions which are the most suitable.
2	There is a mechanism to achieve automatic power down of systems when not in use, including overnight.

M5: Determining the number of credits achieved

The total annual energy consumption of in-scope systems is determined based on the estimated energy consumption data entered in the BREEAM Platform, as described in M2.

Where systems are demonstrated to be energy efficient in accordance with M4 this should be indicated in the BREEAM Platform.

The number of credits achieved is calculated in the BREEAM Platform as follows:

$$\frac{\textit{Annual energy consumption by in} - \textit{scope systems that are energy efficient}}{\textit{Annual energy consumption from in} - \textit{scope systems}} \times \textit{Number of credits available}$$

Partial credits are rounded to the nearest whole number.

Compliance notes

Ref	Terms	Description
CN1	Design team lacks relevant specialist knowledge	Where the design team lack the relevant specialist knowledge, calculations and analysis may be carried out by specialist contractors, manufacturers, suppliers, or installers. The assessor must be satisfied that the analysis has been carried out correctly and compliant evidence is provided.
CN2	Fitting out part of an existing building	Where only part of an existing building is being fitted out and there is cold storage that will serve both the fitted out part and the unchanged part of the building, then this plant is within the scope of this issue and must meet the criteria in order to achieve any available credits.
CN3	Existing lift shaft retained	Where existing lift shafts are being retained, with a new lift system installed, all criteria for this issue can still be assessed and credits awarded accordingly, despite the limitations of the existing shafts. The transport analysis should still be carried out as this will inform the developer of any shortfall in capacity and may influence the design of the new lift system.
CN4	Extending a lift shaft	Where the scope of works regarding a lift only includes extending the lift shaft to other floors, then assessment of this lift is not appropriate. Where changes are made to the lift system, then assessment is required.
CN5	External lighting inside a wider building	'External lighting' that is inside of the wider building, for example a retail unit within a shopping centre, the lighting is external of the retail unit itself but inside of the wider shopping centre, criteria relating to the luminous efficacy should be applied as presented within the manual. For the criteria relating to controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic, however, instead of demonstrating that the lighting is not operational during daylight hours, it should be demonstrated that the lighting is not operational outside of the operational hours of the wider shopping centre.
CN6	Night-time operation – requirement for controls	Projects or areas of an asset which operate at night-time can adapt or omit the requirement to provide controls or presence detection to align with the building's hours of operation. This could, for example, include service yards or car parks.
CN7	Scope of the criteria for lifts – small service lifts (dumbwaiters)	Small service lifts, of the type typically used to transport prepared food and crockery in restaurants (sometimes referred to as 'dumbwaiters'), fall outside the scope of this assessment issue.
CN8	Presence detection – illuminated signs	The requirements for presence detection do not apply to illuminated signs.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Documentation or correspondence identifying the unregulated energy using systems that are included within the project specification. Where systems with low annual energy consumptions have been excluded from the scope due to the cost of replacement, this must be stated and justified.	Updated documentation or correspondence identifying the unregulated energy using systems that are included within the project specification, assessor site inspection report, photographic evidence or other documentary evidence to verify the unregulated energy using systems that have been installed. Where systems with low annual energy consumptions have been excluded from the scope due to the cost of replacement, this must be stated and justified.
2	Calculations to show the estimated energy	Updated calculations to account for any

Criteria	Interim design stage	Final post-construction stage
	consumption by each in-scope system.	changes to the building specification.
3	Calculations used to determine the operational energy consumption of the building.	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
4	Where compliance is demonstrated by comparison to a standard version of the system acceptable evidence sources include: — Written justification for the selection and benchmarking of the standard product based on reasonable assumptions or basic market research. — Specific clauses from reports or manufacturer literature relating to the energy efficiency of the specified actual system. — Design drawings. — Specific clauses from reports or manufacturer's literature relating to the energy performance of the standard product. Plus: — Calculations showing that the actual system is more energy efficiency than a standard system. Where a percentage reduction in energy consumption has been accepted as signifying a meaningful reduction in energy consumption, then this should be stated and justified. Where this is demonstrated by meeting the deemed to comply route as set out within M4.2, acceptable evidence sources are listed for each system type in the following rows.	Where compliance is demonstrated by comparison to a standard version of the system acceptable evidence sources include: — Manufacturer's literature relating to the energy efficiency of the actual installed system. — Final construction drawings or equivalent, Assessor site inspection report and photographic evidence or proof of purchase to verify installed products or systems. Plus: — Calculations showing that the actual system is more energy efficiency than a standard system. Where a percentage reduction in energy consumption has been accepted as signifying a meaningful reduction in energy consumption, then this should be stated and justified. Where this is demonstrated by meeting the deemed to comply route as set out within M4.2, acceptable evidence sources are listed for each system type in the following rows.
	External lighting	
	Relevant section of the building specification or contract clauses. OR Where available, design drawings such as external lighting layout or luminaire schedules. Where products are specified, manufacturer's literature for the proposed luminaires and calculations to show average initial luminous efficacy.	Assessor site inspection report and photographic evidence. Final construction or equivalent external lighting layout drawings or luminaire schedules. Manufacturer's literature for the installed luminaires and calculations to show average initial luminous efficacy.
	Cold storage	
	Design drawings, relevant section of the building specification or contract clauses. Where specific systems are specified: Evidence of the ETL listing for the specific product or evidence to show they are on equivalent list.	Final construction drawings or equivalent and assessor site inspection report and photographic evidence. Evidence of the ETL listing for the specific product or evidence to show they are on equivalent list. Refrigeration plant commissioning record.

Criteria	Interim design stage	Final post-construction stage
	Lifts and escalators	
	Transport analysis. Energy consumption calculations. Relevant section of the building specification or contract clauses confirming energy efficient measures. Where specified, manufacturer's product specifications.	Final construction drawings or equivalent and assessor site inspection report and photographic evidence. Manufacturer's product data.
	Swimming pools	
	Relevant section of the building specification or contract clauses. Where products are specified, manufacturer's product data.	Final construction drawings or equivalent and assessor site inspection report and photographic evidence. Manufacturer's product data. Confirmation of room and pool temperatures.
	Commercial laundries	
	Relevant section of the building specification or contract clauses. Where products are specified, manufacturer's product data.	Final construction drawings or equivalent and assessor site inspection report and photographic evidence confirming installed systems. Manufacturer's technical data on the installed systems to demonstrate they are compliant.
	Cooling systems in server rooms	
	Relevant section of the building specification or contract clauses. Confirmation from a suitably qualified specialist of the most suitable operating conditions.	Final construction drawings or equivalent and technical data on the installed systems to demonstrate they are compliant.

Definitions

Energy using equipment

A standalone item of machinery that can perform its intended function without additional components or controls.

Energy using equipment is assessed in Ene 05.

Energy using system

Machinery that consists of multiple components that must be connected and configured to perform its intended function.

Energy using systems are assessed in this issue (Ene 06).

Regulated energy

Building energy consumption resulting from the specification of fixed building services and fittings, including space heating and cooling, hot water, ventilation, fans, pumps and lighting that are generally controlled through the applicable building regulations and are included in the scope of the Ene 01 assessment.

Unregulated energy

Building energy consumption resulting from building services and fittings that are not generally covered by building regulations and are not included in the scope of the Ene 01 assessments.

Additional information

Worked example of credits available and credits awarded

In-scope systems are a commercial scale laundry, a swimming pool, and lifts.

Regulated energy consumption is 110 MWh per year.

The estimated energy consumption for in-scope systems is estimated to be:

- Commercial scale laundry: 3 MWh per year
- Swimming pool: 20 MWh per year
- Lifts: 15 MWh per year

$$\frac{\textit{Unregulated energy use}}{\textit{Regulated energy use}} = \frac{38}{110} \times 100 = 34.54\% = 4\ \textit{credits available}$$

The swimming pool and the commercial scale laundry meet the energy efficiency system requirements, but the lifts do not.

Percentage of energy consumption for in-scope systems that meet the requirements is:

$$\left(\frac{3+20}{3+20+15}\right) \times 100 = 60.52\%$$

0.6052 × 4 = 2.42 = 2 credits achieved (out of 4 credits available)

Note that this calculation procedure is provided for information only. The credits available and awarded will be determined within the BREEAM Platform based on data entered into the system.

Exclusion of laboratory systems from this issue

Laboratory systems are classed as industrial processes and are no longer included for BREEAM Fit Out assessments.

Ene 07 Flexible demand response

(all buildings)

Aim

This issue recognises installed battery storage and rewards electrical building systems which have the capability to automatically modify their electricity consumption patterns in response to signals from the electricity supplier. This allows consumption patterns to be aligned with the availability of renewable energy and so reduce carbon emissions from grid supply electricity.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 2	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Up to two credits – Flexible demand response

1 Identify electrical systems within the scope of the assessment and determine their flexible demand response capability.

2 The number of credits awarded is based on the number of credits available and the percentage of flexible demand response points awarded (see Table 48).

Table 48: Number of credits awarded

Points awarded	1 credit available	2 credits available
≥ 1% of available points	1 credit awarded	1 credit awarded
> 33% of available points	1 credit awarded	2 credits awarded

Methodology

M1: Flexible demand response

All in-scope electrical systems that are newly installed, refurbished, or renovated as part of the fit-out project must be included for this issue.

The number of credits available is determined by the number of flexible demand response points available for all in-scope systems (see Table 49).

Table 49: Number of credits available

Number of flexible demand response points available	Number of credits available
0	0
1–3	1
> 3	2

The percentage of flexible demand response points awarded is calculated as follows:

$$\frac{Number\ of\ flexible\ demand\ response\ points\ awarded}{Number\ of\ flexible\ demand\ response\ points\ available} \times 100$$

where:

The number of flexible demand response points available is determined by the in-scope electrical systems (see Table 50).

The number of points awarded is determined by the flexible demand response capability of each in-scope system (see Table 50).

Table 50: Flexible demand side response points available and points awarded

Systems present	Points available	Flexible demand capability	Points awarded
Electric space heating	1	Operation can be optimised based on signals from the electricity supplier or local renewable sources.	1
Electric space cooling	1	Operation can be optimised based on signals from the electricity supplier or local renewable sources.	1
Electric domestic hot water	1	Operation can be optimised based on signals from the electricity supplier or local renewable sources.	1
Electric vehicle charging points	2	Charging with **one-way control** based on signals from the electricity supplier or local renewable sources.	1
		Charging with **two-way control** based on signals from the electricity supplier or local renewable sources.	2
Other systems or equipment with flexible demand capability	1	Installed.	1
Battery energy storage	3	Installed battery energy storage with no flexible demand response capability.	1
		The installed battery energy storage system is only capable of charging based on signals from the electricity supplier or local renewable sources.	2
		The installed battery energy storage system is only capable of feeding electricity back into the grid.	2
		The installed battery energy storage system is capable of both charging and feeding electricity back into the grid, based on signals from the electricity supplier or local renewable source.	3

The types of electrical systems within the scope of the assessment and their flexible demand response capabilities must be entered in the BREEAM Platform. This will calculate the number of points available and awarded and hence the number of credits available and awarded.

Compliance notes

None.

Evidence

Criteria	Interim design stage	Final post-construction stage
All	For new systems: Design drawings, relevant section or clauses of the building specification or contract. Where products are specified, manufacturer's product details confirming the flexible demand capability of specified systems. Manufacturer's technical data confirming the flexible demand capability of the installed systems	Final construction drawings or equivalent or assessor site inspection report and photographic evidence showing installed systems. Manufacturer's technical data confirming the flexible demand capability of the installed systems.

Definitions

One-way control

Flexibility demand response capability for electric vehicle chargers that allows the vehicle battery to be charged by the grid based on signals from the electricity supplier or local renewable sources.

Two-way control

Flexibility demand response capability for electric vehicle chargers that allows the vehicle battery to be charged and discharged back into the grid based on signals from the electricity supplier or local renewable sources.

Additional information

Worked example of credits available and credits awarded

A building has electric heating and cooling systems with no flexible demand response and EV charging points with one-way control based on signals from the electricity supplier.

Step 1

Refer to Table 50 to determine the relevant electrical systems present, the number of flexible demand response points available, and the number of points scored:

- Electric space heating system – 1 point available – 0 points scored
- Electric domestic hot water – 1 point available – 0 points scored
- Electric vehicle charging point – 2 points available – 1 point scored

Total points available = 4

Total points scored = 1

Step 2

Refer to Table 49 to determine how many credits are available based on the number of points available:

Total points available = 4

Number of credits available = 2

Step 3

Refer to Table 48 to determine the number of credits awarded:

1 of 4 available points scored = 25%

Number of credits achieved = 1

Note that this calculation procedure is provided for information only. The credits available and awarded will be determined within the BREEAM Platform based on data entered into the system.

Ene 08 Installed controls

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Transport



Summary

This category encourages better access to sustainable means of transport for building users. Issues in this section focus on the accessibility of public transport and other alternative transport solutions (cyclist facilities, provision of amenities local to a building) that support reductions in car journeys and, therefore, congestion and CO_2 emissions over the life of the building.

Assessment issues

Tra 01 Transport assessment and travel plan	2 credits
Tra 02 Sustainable transport measures	8 credits

Tra 01 Transport assessment and travel plan

(all buildings)

Aim

To enhance awareness of existing local transport and identify opportunities for sustainable transport improvements.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Two credits – Transport assessment and travel plan

1 Conduct a site-specific transport assessment focused on the intended occupier's requirements during the Design stage; see M1.

2 Develop a site-specific travel plan that addresses the tenant's organizational travel patterns and following the transport assessment recommendations during the Design stage; see M3.

3 Demonstrate that the travel plan can guide the appropriate implementation of sustainable transport measures within the project scope. Confirm that it is supported by both tenant management and the building's management during operation.

Methodology

M1: Transport assessment

Compliance with criterion 1 can be achieved by either a transport assessment or a transport statement. For Fit Out projects, a transport statement is typically sufficient unless the fit-out involves a significant change in occupancy density or use type.

a. **Transport assessment:** a comprehensive evaluation is required where the project is expected to impact the transport network significantly. This is generally where there will be a change of use, e.g. from an office to a hotel.

b. **Transport statement:** a less detailed report suitable when the project is expected to have limited impact and will implement minimal sustainable transport measures from Tra 02.

The transport assessment or statement must cover the following elements as a minimum:

1. **Development description:** An overview of the project, including its size, type, location, and intended use.
2. **Existing transport infrastructure:** An analysis of current transport infrastructure and services to identify relevant constraints and opportunities. This must include the travel patterns of existing building users in relation to:
    a. Walking infrastructure: sidewalks, paths and crossings.
    b. Cycle infrastructure: cycling lanes and cycle parking.
    c. Public transport: the site's connectivity to public transport services.
3. **Inclusive design:** Evaluation of transport infrastructure for people with disabilities, such as mobility, visual, and age-related requirements.
4. **Accessible amenities:** The number and type of existing accessible amenities within 500 m of the site. The distance to an amenity must be measured via a safe pedestrian route from the main building entrance. See Definitions and Table 51.
5. **Public Transport Accessibility Index (PTAI):** Calculate the existing PTAI, see M2.
6. **Future travel patterns:** Predicted travel patterns and transport impacts of future building or site users.
7. **Stakeholder engagement:** Consultation with local authorities, building users, and the surrounding community to ensure the travel plan aligns with local needs.

When certain elements may not be applicable or relevant, a brief justification can be provided for each consideration, explaining why it is not relevant to the project's scope or scale.

For further guidance on transport assessment and travel plans, it is essential to consult the relevant local transportation authorities, as regulations and guidelines can vary at federal, state, national, and local levels.

Table 51: Amenities in proximity to the site

Amenities
Appropriate food outlet
Access to an ATM (cash)
Access to a suitable outdoor open space
Access to a recreation or leisure facility for fitness or sports
Publicly available postal facility
Community facility
Dispensing pharmacy
Public sector doctor's surgery or general medical centre
Childcare facility or school

M2: Public Transport Accessibility Index (PTAI)

The Public Transport Accessibility Index (PTAI) is calculated as part of the transport assessment. Its value relates to the site location and informs transport-related design decisions. The PTAI must be based on current information, including any planned and publicly notified changes during the transport assessment, and should be used as the benchmark for the assessment.

Where unforeseen changes to public transport availability are later implemented before post-construction certification, the PTAI should not be updated at the post-construction stage.

M2.1: Calculating the PTAI

Enter the following information into the BREEAM Platform to determine the PTAI of the assessed building:

1. Public transport type (bus, rail, tube/metro, tram, other services).
2. Distance (m) from the main building entrance to each compliant public transport node.
3. Average number of services per hour at each node during the building's operating hours.

Compliant public transport node criteria:

a. A bus stop within 650 m or a railway station (or other transport service) within 1000 m of the main entrance, measured via a safe pedestrian route.

b. The service must connect to an urban centre, major transport node, or community focal point (e.g., school, library, doctor's surgery).

c. Only local services are assessed; national services are excluded unless they function as local commuter routes.

M2.2: Calculating the average number of services for PTAI

Follow the steps below to calculate the average number of services:

1. For each public transport node (e.g., bus stop, train station), count the total number of services stopping during the identified operating hours.
2. Determine the building's operating hours: Identify the building's peak arrival and departure times or its typical daily operating hours (e.g., 08:00–19:00, a total of 11 hours). If the building operates 24/7 or the hours are unknown, use Table 52 below.
3. Calculate the average number of services per hour: Divide the total number of stopping services by the total operating hours.
4. Repeat this calculation for each public transport node associated with the assessment project

Example calculation

— Operating hours: 08:00–19:00 (11 hours)

— Stopping services: 35 services during this period

— Average services per hour: 35/11 = 3.2 services per hour

Table 52: Default hours of operation by building type for a typical day

Building type	Default hours
Education: Preschool, school, sixth form college	07:30–10:00, 15:00–17:30
Education: Further education and higher education institutions	08:00–19:00
Healthcare	07:00–20:00 (encompassing visiting hours and the typical daytime shift pattern)
Retail: Shopping centre	09:00–19:00
Retail: Supermarket	08:00–22:00
Retail: Retail services	08:00–18:00
Retail: Convenience store	07:00–22:00
Retail: Retail park or warehouse	08:00–20:00
Retail: Retail store	08:30–17:30
Residential	08:00–19:00
Government services: Law court	08:00–19:00
Prison (UK only)	07:00–20:00 (encompassing visiting hours and the typical daytime shift pattern)
Other	08:00–19:00 *Or use any of the above hours, as appropriate to the building type.*
24-hour building	07:00–20:00

M2.3: On-demand public bus services

Demand-based bus services operated by public transport providers can be included in the PTAI calculation. The project team must determine an average number of stops per hour to allow input into the BREEAM Platform.

These can be recognised as follows:

— The location of the transport node should be determined as the nearest available pick-up point to the assessed building.

— The frequency of the service should be considered as the published maximum wait time (or actual average wait time if the service is established and this data is available).

— Such services, while serving multiple destinations, should be considered as a single route.

— It must be demonstrated that information on the availability and how to access the service is made available to building users.

This is limited to on-demand bus services, which are operated as public transport with multiple pick-up and drop-off points. It does not extend to private hire, taxis, or other similar operations.

M2.4: Multiple services

Services that operate from more than one node within proximity of the building must be considered only once, at the node closest to the building. Different services at the same node count as separate services.

M2.5: Bi-directional routes

Routes may be bi-directional; however, for the purpose of calculating the index, consider only the direction with the highest frequency.

M3: Travel plan measures

A travel plan should demonstrate how the transport assessment has influenced its development, outlining the specific outcomes, targets, and measures required, and setting out plans for future monitoring and management. It guides the implementation of sustainable transport measures during the design, construction, and occupancy stages. It is also intended to be a live document adopted by building management to support an ongoing sustainable transport strategy.

Key considerations
When developing the travel plan, the following considerations must be addressed at a minimum:

1. Engaging with local authorities, building users, and the surrounding community to ensure the travel plan aligns with local needs.
2. Considering all types of users, ensuring equitable access and inclusivity.
3. Negotiating with public transport companies to increase the local service for the development.
4. Providing a public transport information system in a publicly accessible area.
5. Providing electric vehicle charging infrastructure.
6. Providing priority parking spaces for car sharers.
7. Designating priority parking spaces for individuals with disabilities.
8. Reducing parking spaces or implementing parking charges.
9. Consulting with the local authority on the state of, and improvements to, the local cycling network.
10. Providing a pedestrian and cyclist-friendly environment. This includes providing:
    a. Cycle lanes.
    b. Safe crossing points.
    c. Direct routes.
    d. Appropriate tactile surfaces.
    e. Landscaping and shelter for public transport waiting areas.
    f. Good lighting, signposting to other amenities, public transport nodes, and adjoining off-site pedestrian and cycle routes.
11. Providing dedicated and convenient cycle storage.
12. Providing cyclists' facilities.
13. Identifying existing amenities and assessing potential enhancements.
14. Providing suitable taxi drop-off or waiting areas.
15. Ensuring rural buildings have appropriate access to transport to serve the local community adequately.

Consider the following scenarios regarding the building occupiers:

Building occupier is known

— Confirm that the building occupier has been actively involved in developing the travel plan.
— Ensure that the building owner agrees to implement the travel plan to support their transport strategy.

Building occupier is unknown

— A travel plan is still required, even if the end-user or occupier is unknown.
— The developer must confirm that the travel plan will be handed over to the building owner or future occupier.
— Include provisions in the handover documentation to ensure the travel plan can be implemented by the future occupier (e.g. responsibilities, required measures, and review arrangements).

When certain measures may not be applicable or relevant, a brief justification can be provided for each consideration, explaining why it is not relevant to the project's scope or scale.

Evidence of the implementation of specific travel plan measures is not required for Tra 01 (this is addressed under Tra 02).

Compliance notes

Ref	Terms	Description
CN1	Transport assessment included in the travel plan	The transport assessment can be incorporated into the travel plan instead of a separate report. Relevant information must be distinctly identified between the transport assessment and the travel plan document. The travel plan must effectively showcase how the transport/travel assessment has informed the strategic elements of the plan.
CN2	Travel plan – Existing travel plan	An up-to-date organisational travel plan can be used to demonstrate compliance, provided it meets the requirements of M3. The plan must cover all building users of the assessed building and account for any additional travel generated.
CN3	Accessible amenities and PTAI – Main building entrance to consider for a site with multiple buildings	For assessments on sites with multiple buildings (e.g. education campus, business or industrial parks): — Distances to amenities and public transport nodes can be measured from the site's main entrance if ≥80% of buildings are within 1000 m. Otherwise, use the assessed building's main entrance, and in cases, where multiple buildings are included, calculations must always be based on the worst-case scenario (the entrance furthest from the node or amenity). — Where the site has more than one main entrance, either entrance may be used for the calculation.
CN4	PTAI – Community transport schemes in rural areas	In rural areas, where scheduled public services may be limited, community transport schemes, including 'on-demand services', should be noted in the 'Transport assessment and travel plan'; however, unscheduled services cannot be accounted for when calculating the PTAI.
CN5	PTAI – Future transport nodes	Where a transport node is currently inactive but will become active soon after project completion, it can be included when calculating the existing PTAI. To demonstrate this, the appropriate public transport authority or company must confirm the start of service date and frequency.
CN6	PTAI – Park and Ride services	Park-and-ride bus services run from one or more car parks to a city centre or other destination. They allow travellers to park their cars at a convenient location and complete their journey by bus. These generally stop at transport nodes *en route* to allow passengers to board or alight. In such cases, where appropriate, this can be considered as contributing to the PTAI.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	A copy of the transport assessment or statement. Justification of why transport statement was chosen over transport assessment (if applicable).	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
	Submit the PTAI calculation inputs to the BREEAM Platform. — Scale map highlighting the location of the building and all public transport nodes in the proximity of the building via a safe pedestrian route; updated digital	When web-based maps are outdated, the Assessor's site inspection and photographic evidence are needed to confirm: — Location of public transport nodes. — Location of key local amenities. — Key areas of safe pedestrian route.

Criteria	Interim design stage	Final post-construction stage
	sources such as online mapping services may be used. — Timetables for each service at each public transport node. — Calculations to show average services per hour for each node. — When applicable, information about the on-demand bus service. To-scale maps or drawings to show the location and type of key local amenities present and their distance from the assessed development via a safe pedestrian route; digital sources such as online mapping services may be used.	
2	A copy of the travel plan.	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
2, 3	Where the building occupier is known, documentation confirming the building occupier's involvement in the travel plan. Where the building user is not known, documentation confirming that the travel plan will be handed by the developer to the building owner.	Written agreement from the building owner to implement the travel plan to support their transport strategy. Handover documentation to ensure the travel plan's future implementation.

Definitions

Accessible amenities

Amenities are accessible via safe pedestrian routes. All listed amenities must be open during typical working hours for the asset type and when employees benefit from them.

— **Appropriate food outlet:** a fixed asset that caters to the day-to-day needs of most building users — for example, a café, take-away, restaurant or food shop. A vending machine can qualify as a food outlet if it consistently offers a variety of items that reasonably meet the needs of building users and is confirmed to be a permanent fixture. A food truck or mobile catering service would not be sufficient to meet the criteria for this issue.

— **Access to an ATM (cash):** this refers to the availability and convenience of reaching an Automated Teller Machine (ATM) to access cash. Building users should have access to cash at all relevant times of the day. An ATM inside a building is acceptable as long as its operating hours are convenient for building users.

— **Suitable outdoor open space:** a space that allows building users to sit outside and take a break. This could be an open-air courtyard or external space within the site, a pedestrianised public piazza, or a local park. The space must be suitably sized for the number of people likely to use it and must not form part of the public highway. Where a compliant outdoor open space also meets the criteria for 'Outside space' in Hea 07, it can be considered under both issues.

— **Recreation or leisure facility:** a building that allows building users to exercise and maintain a healthy lifestyle. Examples include a local leisure centre, tennis courts, or a gym.

— **Publicly available postal facility:** a publicly accessible facility that enables the general public to send postal items. This includes staffed facilities offering postal services, traditional post boxes, and multicarrier smart lockers that support outbound services for multiple independent operators. Single-carrier lockers or collection-only points are excluded.

— **Community facility:** a space facilitating community activities for the assessed building's users. Examples include a community centre or hall, collaborative work areas, recreational zones, shared gardens, or allotments. Note that

suitability depends on the building's purpose and the needs of its occupants.

- **Dispensing pharmacy:** an accessible pharmacy that provides prescribed medicines for building users. If services are confirmed, an internal pharmacy within a hospital or an on-site controlled medical dispensary may be acceptable.
- **Public sector doctor's surgery or general medical centre:** a healthcare facility or general medical centre providing general practitioner services and basic medical care to the community.
- **Childcare facility or school:** a dedicated facility or institution that provides child support for potential building users, such as nurseries or schools.

Building users

This can be any of the following, as appropriate to the building type:

1. Staff (commuter journeys and business travel)
2. Pupils and students
3. Visitors
4. Patients
5. Customers
6. Community users
7. Delivery workers, contractors, or service providers who regularly work at or access the building
8. Residents.

Main building entrance

The main building entrance is the entrance to the assessed building, which is directly connected to the main building reception, circulation routes, lifts, or stairs. It is available to most of the building's staff and visitors on arrival. It is not the site entrance (unless the site entrance is also the building entrance, e.g., a building with a boundary on a public highway). In the context of campus-style developments, the site entrance may serve as the building entrance (see CN3 on page 187).

For prison or military site assessments (UK only), the main entrance should be taken as the gatehouse entrance.

Operating hours in a typical day

Operating hours refer to the period during which a building is in use on a typical day. In choosing a typical day, the assessor should check that timetabled information for that day is, within reason, representative of the public transport provision for the entire operating week. In most cases, the building's normal operating hours can be used.

Where shift patterns see most building users (≥ 80%) arriving or leaving during a certain period, that period can be used as an alternative to the operating hours of the building.

For example, this could be an office building where most office workers arrive between 08:00 and 10:00. This accounts for some building types that operate a 24-hour day and on shifts.

During late night hours, when there is little public transport, such periods do not need to be accounted for when assessing this issue.

Public Transport Accessibility Index (PTAI)

An indicator of the accessibility and density of the public transport network at a point of interest (the BREEAM-assessed building). The BREEAM PTAI is adapted from the Public Transport Access Level method. The index is influenced by the proximity and diversity of the public transport network and the frequency of services at the accessible nodes. The greater the number of compliant nodes, services, and their proximity to the building, the higher the PTAI.

Safe pedestrian route

Safe pedestrian routes include pavements, paths, and safe crossing points. The distance must not be measured in a straight line but along an actual walking route.

Transport assessment

Transport assessments and transport statements evaluate potential transport impacts of development and may propose measures to promote sustainable development. To be effective, they must be carried out during the early design stages to influence time-critical aspects of the design.

Travel plan

A travel plan is a strategy for managing all travel and transport within an organisation. It contains physical and behavioural measures to increase sustainable travel choices to a site or development. It must be developed at the early design stage closely collaborated with, and informed by, a transport assessment or statement.

Additional information

None.

Tra 02 Sustainable transport measures

(all buildings)

Aim

To maximise the potential for people to choose public, active and lower-emission private transport by providing the site with convenient, sustainable options.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	8	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Prerequisite – Transport assessment and travel plan

1 Complete a transport assessment and travel plan in line with Tra 01.

Up to eight credits – Transport options implementation

2 Calculate the credits as follows:

2.a Refer to the score given in the Public Transport Accessibility Index (PTAI) as calculated in Tra 01. This score will be used to weight the points awarded in Tra 02.

2.b Award points where sustainable transport measures are available to the building occupants, including measures newly implemented or already in place as part of the development, in accordance with Table 53 below.

2.c Use Table 54 on the next page to convert the number of points achieved for sustainable transport measures into credits, as weighted by the PTAI score.

Table 53: Summary of sustainable transport measures and points

Option	Sustainable transport measures	Points
Public transport measures		
1	The existing PTAI calculated as per Tra 01 is worth one point if it is: a. ≥ 4 for prison or military sites (UK only), rural location buildings, and further and higher education buildings. b. ≥ 8 for all other building types.	1
2	Improve the existing PTAI by at least 1.00 – any successful intervention receives the full three points.	3

Option	Sustainable transport measures	Points
	For example: — *Negotiating with local public transport companies to increase service provision for the development.* — *Providing a diverted bus route, a new bus stop, or similar.* — *Providing a dedicated transport service, such as a bus route.*	
3	Provide up-to-date local public transport information in a convenient, accessible area to help building users plan journeys by public transport.	1
Private transport measures		
4	Provide electric vehicle charging infrastructure, ≥ 7 kW EV charging points and associated cable routes, see M1.	1 or 2
5	a. Set up a car sharing group or facility to promote car sharing among building users. b. Actively market the car sharing scheme and provide communication channels that make it easy to join and use. c. Provide priority spaces for car sharers, allocating ≥ 5% of the total staff car parking capacity. d. Ensure that car share spaces are placed near the building entrance as the requirements of other types of priority parking (disabled, etc.) allow.	1
Active travel measures		
6	a. Engage with the local authority at the earliest (brief) stage to review public cycle and pedestrian routes. b. Agree on possible improvements to the local active travel network that supplement existing plans and are relevant to the site/project. c. Select at least one such improvement and carry it out.	2
7	Install at least the minimum number of cycle storage spaces as set out in Table 58 (see M2).	1
8	Having supplied cycle storage space as per Option 7 above, provide building users with at least two of the following facilities: — Showers — Changing facilities — Lockers — Drying spaces. *Where facilities are combined – e.g. showers and changing facilities – it must be possible for different people to use them at the same time if they are to count as more than one facility.*	1
9	**Existing amenities:** Ensure at least three relevant amenity types within ≤ 500 m of the building entrance (see M4).	1
10	**New (additional) amenities:** Provide new amenities that are relevant and accessible within ≤ 500 m of the building entrance (see M4).	2 or 3
Alternative transport measures		
11	Carry out one site-specific improvement measure in line with the travel plan not listed as an option in Tra 02. Submit this for BRE review.	1 to 3

Use Table 54 below to calculate how many credits to award for the points achieved from implementing a selection of Options 1–11 in Table 53 above.

Table 54: Credits awarded based on PTAI and the number of points achieved for sustainable transport measures

Number of points achieved for sustainable transport measures			Credits awarded
PTAI < 25	25 ≤ PTAI < 40	PTAI ≥ 40	
1	1		1
2		1	2
3	2		3

Number of points achieved for sustainable transport measures			Credits awarded
PTAI < 25	25 ≤ PTAI < 40	PTAI ≥ 40	
4		2	4
5	3		5
6	4	3	6
7	5		7
8 or more	6 or more	4 or more	8

Example

- Options 1, 2, 7 and 8 have been successfully implemented = 1 + 3 + 1 + 1 = 6 points for sustainable transport measures.
- The PTAI score for the site is 30.
- For a site with a PTAI score between 25 and 40, 6 points are worth 8 credits.

Methodology

M1: Electric vehicle charging infrastructure

Option 4 (up to 2 points) from Table 53 on page 191

- **1 point:** Minimum requirements for EV charging infrastructure have been met (see below).
- **2 points:** Minimum requirements have been met, and the EV charging score is 20 or above, as calculated using all EV charging infrastructure combined (i.e. active and passive). OR, 30% of the total parking spaces must have active EV charging points providing a minimum capacity of 7 kW.

Minimum requirements
EV charging infrastructure requirements apply exclusively to the parking spaces associated with the assessed building. At least 30% of total parking spaces must have EV charging infrastructure comprising:

- **At least 10% active EV charging:** A minimum of 10% of the total parking spaces must have fully operational EV charging points providing a minimum capacity of 7 kW.
- **Remaining 20% as passive EV charging:** The remainder of the 30% requirement must have the necessary infrastructure (e.g., cable routes, electrical supply) to support future demand.

EV charging places must be accessible to all building users. The design team should consider designating a proportion of EV charging spaces to priority parking.

Calculation method
The EV charging score is calculated as follows:

$$EV\ charging\ score = \frac{\sum(PS \times PST)}{TS} \times 100$$

Where:

PS = Provision score (see Table 55 below)

PST = Number of parking spaces with the same provision score

TS = Total number of parking spaces associated with the assessed development

Table 55: Provision score for EV charging infrastructure

Provision	Provision score
Active EV charging infrastructure (≥ 7 kW)	0.5
Active EV charging infrastructure (≥ 22 kW)	1
Passive EV charging infrastructure	0.5

Example calculation

For 2 points:

As stated above, a result of ≥ 20 is needed to achieve the maximum 2 points available for providing EV charging infrastructure. This example shows how a building with 100 parking spaces would achieve a result of 20 using the EV calculation method (see Table 56 and Table 57).

Table 56: Example of the provision score for EV charging infrastructure

Example 1	Qty	% total space allocated
Parking spaces	100	-
Active EV charging infrastructure (≥ 7 kW)	0	0%
Active EV charging infrastructure (≥ 22 kW)	10	10%
Passive EV charging infrastructure	20	20%

Table 57: Example score calculation for EV charging infrastructure

Provision	Calculation	Subtotal
Active EV charging infrastructure (≥ 7 kW)	0 × 0.5 =	0
Active EV charging infrastructure (≥ 22 kW)	10 × 1 =	10
Passive EV charging infrastructure	20 × 0.5 =	10

EV charging score = (20 / 100) × 100 = **20**

The assessed building meets the minimum requirement that 30% of its parking spaces have EV charging infrastructure, comprising at least 10% active and 20% passive EV charging. Therefore, it receives **2 points**.

M1.1: Communal car parking and site-wide campus

Where the assessed building uses a communal car park or is part of a campus:

- The provision for EV charging infrastructure is calculated based solely on the parking spaces (existing and new) associated with the assessed building.
- Where the overall parking area(s) are shared with other buildings, the proportion of communal parking spaces associated with the assessed building should be calculated pro rata. For this calculation, use the building's occupancy relative to the occupancy of the entire site. If occupancy is unknown, use the building's relative floor area.
- The EV charging spaces must be conveniently located near the building and managed to ensure availability for its users.
- Where visitor parking spaces are designated for short-term use only (a maximum of 15 minutes), such as for order collection or drop-off at retail outlets, they can be excluded from the calculation for EV spaces. Other scenarios may be considered where appropriately justified.

M1.2: Phased development

Where phases of a project are assessed at different times:

- Calculations relating to EV charging provision should be based on the spaces associated with the assessed building.
- Pro-rata calculations can include EV infrastructure completed in the current and previous phases, provided it aligns with the phasing plan.

— EV infrastructure from future phases may count if a binding contract ensures delivery, with clear timelines and alignment with the phasing plan.

M1.3: Extensions

Where parking is integrated with the main building:

— EV requirements must be based on the total parking demand associated with the project, including both existing associated spaces and any new spaces created.

— Proportional allocation formula:

Determine the project's share of the total site parking using either GIA or occupancy.

— Allocated project parking = Total site parking × (Project GIA ÷ Total GIA), OR

— Allocated project parking = Total site parking × (Project occupancy ÷ Total occupancy)

— Apply this proportion to the total parking provision (new and existing) to determine the number of spaces associated with the extension.

— Use this number of spaces to determine the EV infrastructure requirements based on the relevant criteria.

M2: Cycle storage spaces and cyclists' facilities

Option 7 (1 point) and Option 8 (1 point) from Table 53 on page 191

Table 58 sets out the **minimum number of cycle storage spaces** required for each type of building. See compliant cycle storage in Definitions. The principle is that staff cycle storage determines the need for facilities, while visitor storage is provided separately but does not generate additional facility requirements.

1. The number of **cyclist facilities** is determined only by the number of **staff** cycle storage spaces. Storage provided for visitors, clients or patients does not affect this calculation (e.g. visitors arriving by bicycle are not expected to require showers or changing facilities).
2. All calculations must be **rounded up** to the nearest whole number. For example, a calculated requirement of 5.3 cycle spaces means that 6 spaces must be provided.
3. Once the calculation (including rounding) has been completed, the following **absolute minimum provision** must still be met:
    a. At least **4 cycle spaces** for all building types.
    b. At least **10 cycle spaces** for large retail assets.
4. These minimums apply **regardless of any reductions** permitted under M2.3 (high PTAI), M2.4 (rural location), or M2.5 (sliding scale).

Table 58: Cycle storage spaces required for each type of building (Option 7)

Building type	Number of spaces	Unit of measure	Notes
Type A	1 per	10 staff	A building predominantly occupied by staff or employees with occasional business-related visitors, e.g. office, industrial, fire station, police station. This includes hospitality, where visitors typically stay for less than one month.
Type B	1 per	10 building users (staff **and** visitors)	A building occupied by core staff or employees with consistently frequent visitors or users (either residents or non-residents). This includes cafés, restaurants, culture and entertainment, sports and leisure and secure accommodations. Compliant cyclists' facilities are required for staff only.
Specific building types			

Building type	Number of spaces	Unit of measure	Notes
Retail			
Large retail	1 per	10 staff **and**	For staff calculation, use the maximum number of staff at any one time or shift. Provide a minimum 10 cycle spaces for building users.
	1 per	20 public car parking spaces	
Small retail	4	In total	Spaces are publicly accessible within proximity of a main building entrance. Compliant cyclists' facilities are required for staff only.
Education			
When an educational facility consists of buildings in more than one category (e.g. nursery and primary school), select the dominant building type in the BREEAM Platform. Calculate the requirement separately for each user group and combine the results. For instance, a combined preschool and primary school will need to meet both 1 space per 10 staff and 5 spaces per class in year group requirements.			
Preschool	1 per	10 staff	-
Primary school	5 per	Class in the largest year group	Where the number of classes varies across year groups. For example, a primary school with five classes in its biggest year group would provide 25 cycle storage spaces for the whole school.
Secondary school or higher education	1 per	10 staff **and**	Secondary school covers education from ages 11–18. Higher education: all students accounted for: — Undergraduates — Post-graduates — PhD students — Post-doctorates
	1 per	10 students	
Healthcare			
All healthcare building types	1 per	10 staff **and**	For staff, use the maximum number at any time or shift.
	1 per	2 consulting rooms **or** 10 beds	Use the largest unit of measure for the building type. For example: — Use beds for a hospital. — Use consulting rooms for a doctor's surgery. For special healthcare buildings (e.g. chemotherapy centres, maternity wards), cycle spaces for patients/visitors may be excluded.
Residential institution			
Student accommodation (Halls of residence), key worker accommodation, military barracks, local authority secure residential accommodation	1 per	10 staff **and**	-
	1 per	2 residents	
Residential care home, sheltered housing	1 per	10 staff **and**	-
	1 per	10 visitors or beds	
Sliding scale of compliance Where the number of building users (based upon the unit of measure) exceeds 200, the sliding scale of compliance can be used to identify the appropriate number of cycle spaces required (see M2.5).			

M2.1: Estimating provision – Unknown building occupancy

If building occupancy is unknown, estimates must be based on either:

- Default occupancy rates (see Table 61 on page 206), or
- Rates from a comparable building type and size

Justifications must be included in the assessor's report.

M2.2: Cyclists' facilities requirements

Cyclists' facilities (e.g., showers, lockers, drying spaces, changing rooms) must be provided based on the number of staff cycle storage spaces. Visitors, clients, and patients are excluded from this calculation.

Facilities must meet the specifications outlined in the Definitions section for compliant facilities.

M2.3: Adjustment for high Public Transport Accessibility Index (PTAI)

Where the site achieves a high PTAI score (i.e. meets the threshold set in Option 1, Table 53 on page 191), the number of required cycle storage spaces and associated cyclist facilities may be reduced by 50%.

Note: This reduction cannot be combined with those in M2.4 (rural location) or M2.6 (public bicycle sharing systems).

M2.4: Adjustment for Rural locations

Cycle storage and associated facility requirements are reduced for rural sites, based on their distance from the nearest urban centre. The applicable reductions are shown in Table 59 below.

Table 59: Rural location distance to reduce the number of cycle storage spaces and cyclists' facilities

Distance to nearest urban location	Cycle storage and cyclist facility requirement adjustment
> 15 km	Reduced by 50%
> 30 km	Reduced by 70%
> 50 km	Reduced by 90%

M2.5: Adjustment for large user assets – Sliding scale

Option 7 from Table 53 on page 191

Where the number of building users exceeds 200, a sliding scale can be used to reduce the required number of cycle storage spaces, as set out in Table 60 below.

This scale applies up to 5,000 users. Beyond 5,000 users, no further cycle storage is required.

The sliding scale of compliance **does not** apply to the following building types:

- Large retail
- Primary schools
- Residential institutions and military residential buildings

Table 60: Sliding scale of compliance – multiplier based on number of users

Number of users	Multiplier for standard unit of measure
1–200 users	× 1.0
201–300 users	× 1.5
301–400 user	× 2.0
401+ users	× 2.5

Example calculation

For example, an office building with 800 users:

- *1–200 users @ 1 space per 10 users = 20 spaces*
- *201–300 users @ 1 space per 15 users (unit of measure × 1.5) = 6.7, rounded up to 7 spaces*
- *301–400 users @ 1 space per 20 users (unit of measure × 2) = 5 spaces*
- *401+ users @ 1 space per 25 users (unit of measure × 2.5) = 16 spaces*

Total compliant cycle storage spaces required = 48 spaces.

M2.6: Public bicycle sharing systems – Partial compliance option

Public bicycle sharing systems and cycle storage

Up to 50% of the required cycle spaces may be provided by a public bicycle-sharing system if the system is:

1. Implemented by the local government through a public-private partnership.
2. Open to casual users who wish to use it for one-way rides.
3. Available at unattended urban locations throughout the city.
4. Supplied with service terminals at maximum 500 m (on average) distance from each other in inner city areas.
5. Available within 500 m of the main building entrance.

Unlike all other cycle storage spaces referred to in this issue, the bicycle terminals of a public cycle sharing system do not need to be compliant as described in the Definitions.

Cyclists' facilities and public bicycle-sharing systems

Using public bicycle-sharing systems to supply cycle spaces does not reduce the requirement for cyclists' facilities. This is still based on the total number of spaces, including public cycle spaces.

M3: Cycle storage spaces and cyclists' facilities on sites with multiple buildings

Option 7 (1 point) and Option 8 (1 point) from Table 53 on page 191

Where:

- A new or infill building is constructed on an existing site. OR
- Multiple new buildings are to be constructed on the same site.

Compliance can be assessed either for one building or for the whole site, depending on the configuration and location of the proposed cycle storage and associated facilities. Whichever approach is chosen, the assessor must justify this choice in their report.

M3.1: Standalone approach

The guidance for calculating the cycle storage requirement and associated facilities for a building on a multi-building site is the same as for any single building.

In this case, the location, signage and access must make clear that the cycle spaces assigned to users of the assessed building are for their specific use.

M3.2: Site-wide approach

Where a group of buildings are on a site sharing cycle storage spaces and/ or facilities, the requirement can be calculated based on all site users.

Cyclists' facilities may be located in designated areas to ensure easy access and usability, and existing compliant facilities can be included in the calculation. However, the route to the cycle storage and facilities must be within 500 metres of the main entrance of the assessed buildings, measured along a safe and convenient path.

For sites with strict security protocols, where all staff are required to pass through a centralized facility (e.g., staff room or security checkpoint) before proceeding to their work areas, it is acceptable to calculate the distance only between the cycle storage and the centralized cyclist facilities. Evidence should include a site plan and confirmation of staff movement through the centralized location.

M3.3: Combination of the two approaches

Where appropriate, cycle storage can be provided based on a site-wide assessment, with facilities provided on a building-by-building basis.

In the opposite instance, where cycle storage spaces are provided for a single building, but associated facilities are shared by buildings across the site, the number of facilities must be based on the number of site users rather than on cycle spaces for the single building. Such facilities must be close to cycle storage for all users.

M3.4: Provision for extensions

When assessing an extension to a building, partial refurbishment, or a stand-alone building that extends an existing facility for the same building users, the site-wide approach can be used to determine the number of cycle spaces required.

M3.5: Phasing or pending demolition works

Where cycle storage cannot be installed at the construction stage due to phasing or pending demolition works, compliance can still be shown, provided that:

- Context and justification are given for why the storage is unavailable.
- A written contractual agreement is in place to provide BREEAM-compliant storage within a clear and justifiable time scale, accounting for related works that could reasonably delay the final installation of facilities related to the development.
- In the meantime, alternative storage is provided that allows bikes to be easily stored, removed and locked securely against a fixed structure.

These temporary measures apply to cycle storage spaces only. Provision of cyclists' facilities must be assessed in the usual way.

M4: Existing and new amenities

Option 9 (1 point) and Option 10 (2 or 3 points) from Table 53 on page 191

To achieve points under Option 9 or Option 10, the building must have access to relevant accessible amenities. All amenities, whether new or existing, must be within 500 m of the assessed building's main entrance via a safe pedestrian route. The relevant types of amenities are listed below and apply to all building types:

1. Appropriate food outlet
2. Access to an ATM (cash machine)
3. Access to an outdoor open space (public or private, provided suitably sized and accessible to building users)
4. Access to a recreation or leisure facility for fitness or sports
5. Publicly available postal facility
6. Community facility
7. Dispensing pharmacy
8. Public sector doctor's surgery or general medical centre
9. Childcare facility or school

Notes:

1. An amenity can be provided by the assessed building itself if that is its function, for example, it is a food shop or a pharmacy.
2. Amenities may be inside an assessed building or on-site, for example as part of a campus, retail or business park or centre.
3. Amenities may be part of a masterplan where this has been produced by a single developer, and such amenities may be assessed as new, rather than existing for building-level assessments on the site.
4. More than one amenity may be provided at a single location, for example, an ATM and a pharmacy within a supermarket development could be considered as three amenities.

M4.1: Existing amenities

Option 9 (1 point) from Table 53 on page 191

One point can be awarded for providing at least three accessible types of amenities ≤ 500 m via a safe pedestrian route.

M4.2: New (additional) amenities

Option 10 (2 or 3 points) from Table 53 on page 191

Two or three points can be awarded for providing new amenities ≤ 500 m via a safe pedestrian route.

If new amenities duplicate the services provided by existing amenities, this is still recognised. This is because these duplicate amenities still offer additional choices to users in terms of services and location.

— **2 points:** at least one new (additional) amenity type.

— **3 points:** two or more new (additional) amenity types.

Compliance notes

Ref	Terms	Description
CN1	Existing sustainable transport measures	Existing sustainable transport measures may be considered where they are BREEAM-compliant, appropriately located, and available to all relevant users of the refurbishment project.
CN2	PTAI calculation – Changes to public transport services during the assessment	The PTAI is calculated as part of the design stage transport analysis described in Tra 01. It serves as a benchmark from that time and should not be updated at the post-construction certification stage.
CN3	More onerous requirements	Where the local authority's requirements are more onerous than BREEAM (e.g., number of electric charging points or cycle storage spaces), these must be met for credits to be awarded.
CN4	Cycle spaces – Public realm provision	Where it is not possible to locate short-term visitor or customer cycle storage spaces within the assessment boundary, these may be provided in a suitable and convenient location within the public realm. The assessor must be satisfied that there is a legal agreement and a long-term commitment to maintain these spaces. Overhead covering may be waived if justified. Existing public spaces do not count toward compliance.
CN5	Cycle spaces – Specialist education assessments	For specialist educational institutions (for example, non-acute SEN facilities) assessors should use their judgment on how to base their cycle storage calculations. Supporting evidence needs to be provided, along with the assessor's comments or notes, to clarify the calculations used to demonstrate compliance.
CN6	Cyclists' facilities – Education: Primary schools	Additional facilities for pupils can include adequate cloakroom space for storing outdoor clothing and cycle helmets. For staff, facilities should include 1 locker per 10 staff members and 1 shower per 10 lockers, with at least one shower provided. Primary school pupils are not expected to have private showers or cycling facilities.
CN7	Cyclists' facilities – Education: Secondary schools	In secondary schools with sports facilities, compliance is met for **students** by providing lockers, as showers and changing spaces are assumed to be included with the sports facilities and do not need separate assessments. For **staff**, separate showers and changing facilities must be provided. While locker facilities can be shared with students if appropriately located, staff lockers should be conveniently situated near other staff facilities. The number of showers for staff should be based on the total number of staff, with a minimum of one shower for every 100 staff members.
CN8	Cyclists' facilities – Residential institution (long term stay)	Where there is a BREEAM requirement for residents, compliant facilities within their accommodation can be considered as cyclists' facilities. Separate facilities for staff must be provided as required to achieve compliance.
CN9	Cycle facilities – Shell only or shell and core assessments	Developers must provide all aspects of additional cyclists' facilities within their scope of work and enable future completion of any remaining aspects. For example: if core areas lack facilities such as showers, drying space, or internal walls to tenanted areas, these must be noted on design drawings, with necessary services provided for future installation by tenants. Developers must show that they are enabling future installation of BREEAM compliant facilities within their scope of work. Where internal walls are within scope, a compliant changing area must be provided, however for lockers, compliance can be achieved by providing a design drawing showing that there is an adequately sized and suitably located space for the required

Ref	Terms	Description
		number of compliant lockers.
CN10	Limiting or restricting car parking capacity	Compliance typically relies on external requirements such as site constraints, planning restrictions, or nearby public parking, which are not active efforts to reduce private car reliance. Restricting parking is not generally an alternative sustainable transport measure, except when meeting specific criteria: — The travel plan recommends the absence of standard parking. — The development has an Public Transport Accessibility Index ≥ 25. — There is adequate site access, but parking has been deliberately omitted to promote alternative transport. Please submit this as assessment Option 11 for BRE to review.
CN11	Phased developments	Where new sustainable transport measures will be provided but at a later stage than the completion of the assessed building, they can still count toward BREEAM compliance provided there is a formal commitment (e.g. within the General Contract Specification) to deliver them within the shorter of: — When 25% of all phases are complete and occupied. OR — Within 25% of the total build time for the phase of the assessed building (measured from that phase's completion). Importantly, if these transport measures will not be available within five years of the building's occupation, they cannot be considered for compliance.
CN12	Accessible amenities and PTAI – Main building entrance to consider for sites with multiple buildings	For assessments on sites with multiple buildings (e.g. education campus, business or industrial parks): — Distances to amenities and public transport nodes can be measured from the site's main entrance if ≥80% of buildings are within 1000 m. Otherwise, use the assessed building's main entrance, and in such cases, where multiple buildings are included, calculations must always be based on the worst-case scenario (the entrance furthest from the node or amenity). — Where the site has more than one main entrance, either entrance may be used for the calculation.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	A copy of the transport assessment or statement. A copy of the travel plan.	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
2	Documentary supporting evidence to verify how the assessment options have been or will be achieved. Evidence may include: — Design drawings — Clauses of building specifications — Contracts — Commitment letters See individual options for more details.	Robust post-construction evidence to verify measures have been implemented. See individual options for more details.
Sustainable transport options		
Option 1	— Submit the PTAI calculation inputs to the BREEAM Platform. — Scale map highlighting the location of the building and all public transport nodes in the proximity of the building. — Timetables for each service at each public transport. — Calculations to show average services	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.

Criteria	Interim design stage	Final post-construction stage
	per hour for each node. — Where applicable, information about on-demand bus services.	
Option 2	— Documentary supporting evidence showing how the PTAI improvement will be achieved i.e. meeting minutes, correspondence with local public transport companies or contractual agreements. — PTAI calculations demonstrating the improvement over the existing PTAI.	— Final PTAI calculations confirming improvement. — Updated evidence, including public transport services, timetables, and maps, submitted for final assessment.
Option 3	— Specifications for the public transport information system (e.g., digital displays or online tools). — Proposed location and accessibility plan for the information system.	— Assessor's site inspection report and photographic evidence of the installed public transport information system. — Documentation showing the system is fully operational and provides real-time updates.
Option 4	— Design drawings showing the planned EV charging parking spaces (passive and active) and total number of parking spaces provided. — Specifications for the EV charging points (e.g., ≥ 7 kW). — Submit the calculation inputs to the BREEAM Platform. — Contractual agreements or purchase orders for EV charging infrastructure.	— Assessor's site inspection report and photographic evidence of the EV charging infrastructure. — Final construction drawings or equivalent showing the location of EV charging parking spaces (passive and active) and total number of parking spaces provided. — Confirmation of installation of EV charging points (minimum 7 kW) such as manufacturer's data sheets and electrical capacity verification.
Option 5	— Car sharing group or policy evidence (e.g., documentation, meeting minutes). — Marketing or communication materials. — Marked-up site plan showing priority spaces for car sharers and total number of parking spaces provided.	— Final policy confirmation, including final car sharing scheme. — Assessor's site inspection report and photographic evidence showing car share spaces in place. — Final construction drawings or equivalent showing the priority spaces for car sharers and total number of parking spaces provided.
Option 6	Correspondence, meeting minutes, or contractual agreements showing consultation with the local authority on cycling and pedestrian routes.	Assessor's site inspection report and photographic evidence confirming the implementation of agreed cycle or pedestrian route improvements. Final construction drawings or equivalent where required.
Option 7, Option 8	— Assumptions and calculations used to determine the number of building users for cycle storage and facilities required. — Design drawings, relevant sections of the building specifications or contract clauses to confirm compliant cycle storage and facilities will be provided.	Assessor's inspection and photographic evidence confirming the installation of compliant cycle storage and associated cyclist facilities (e.g., showers, changing facilities, lockers). Final construction drawings or equivalent showing the installed cycle storage and facilities.
Option 9, Option 10	Marked-up site plan or web-based map viewer highlighting:	Assessor's site inspection and photographic evidence confirming:

Criteria	Interim design stage	Final post-construction stage
	— Building location — Location and type of amenities — Route to amenities — Plan/map scale. For amenities under development, a letter from the client or developer confirming: — Location and type of amenities — Timescale for development	— The existence of local amenities. — Route and distance to amenities. OR Updated and dated marked-up site plan or a web-based navigation map viewer highlighting: — Current location and type of local amenities. — Current route and distance from the building via a safe pedestrian route. — Plan or map scale. OR Where amenities are under development, evidence such as the developer's letter outlining progress and timescale for amenities being available.
Option 11	Submitted proposal and confirmation from BRE.	Will be dependent on the proposed improvement measures. General requirements might include: — Assessor's site inspection and photographic evidence. — Final construction drawings or equivalent.

Definitions

Accessible amenities

Amenities are deemed as accessible if they can be reached via **safe pedestrian routes** during typical working hours for the type of building. Amenities that are unavailable when appreciable numbers of site users would like to use them are not considered accessible.

— **Appropriate food outlet:** a fixed asset that caters to the day-to-day needs of most building users — for example, a café, take-away, restaurant or food shop. A vending machine can qualify as a food outlet if it consistently offers a variety of items that reasonably meet the needs of building users and is confirmed to be a permanent fixture. A food truck or mobile catering service would not be sufficient to meet the criteria for this issue.

— **Access to an ATM (cash machine):** refers to the availability and convenience of reaching an Automated Teller Machine (ATM) to access cash. The building users should have access to cash at all relevant times of the day. An ATM inside a building is acceptable as long as its operating hours are convenient for building users.

— **Suitable outdoor open space:** a space that allows building users to sit outside and take a break. For example, an open-air courtyard or external space within the site, a pedestrianised public piazza or a local park. The space must be suitably sized for the number of people likely to use it and must not form part of the public highway.

— **Recreation or leisure facility:** a building that allows building users to exercise and maintain a healthy lifestyle. Examples include a local leisure centre, tennis courts, or a gym.

— **Publicly available postal facility:** a publicly accessible facility that enables the general public to send postal items. This includes staffed facilities offering postal services, traditional post boxes, and multicarrier smart lockers that support outbound services for multiple independent operators. Single-carrier lockers or collection-only points are excluded.

— **Community facility:** a space that facilitates community activities for the assessed building's users. For example, a community centre or hall, collaborative work areas, recreational zones, shared gardens, or allotments. Note that the suitability depends on the building's purpose and the needs of its occupants.

— **Dispensing pharmacy:** an accessible pharmacy that provides prescribed medicines for building users. If services are confirmed, an internal pharmacy within a hospital or an on-site controlled medical dispensary may be acceptable.

- **Public sector doctor's surgery or general medical centre:** a healthcare facility or general medical centre providing general practitioner services and basic medical care to the community.
- **Childcare facility or school:** a dedicated facility or institution that provides child support for potential building users, such as nurseries or schools.

Building user

Building users are those who will utilize the cycle storage and facilities. Depending on the type of building being assessed, this includes specific groups based on the building's function, such as office staff, commercial staff and visitors, or school staff and students.

Car sharing group

Car sharing refers to a coordinated initiative established, promoted and overseen by asset management to assist building users in sharing private car journeys to and from work. The primary goal is to reduce overall reliance on individual cars for commuting; they differ from vehicle rental or loan schemes. Car sharing must be accessible to all building users who regularly commute by private car. The designated spaces for car sharing must be distinct from customer or visitor areas in the development.

Compliant cycle storage spaces

Cycle storage must be secure, protected, conveniently located, safe to use and sufficiently spacious to manoeuvre. The cycle storage spaces must meet the following criteria:

1. Cycle storage spaces must provide with the means to secure one or more cycles with fixings that allow both the wheel and frame to be locked securely. Cycle spaces must be set in or fixed to a permanent structure (building or hardstanding) and covered overhead. Alternatively, they may be located in a locked structure fixed to, or part of, a permanent structure with appropriate surveillance.
2. The distance between each cycle rack, and between cycle racks and other obstructions such as walls, must allow cyclists to access storage easily.
3. Cycle storage spaces must be in a prominent location that is easily seen, either from an occupied building or from the main access to a building. Where cycle storage spaces are within the building, prominent signage should indicate their location to building users.
4. The cycle storage spaces must have adequate lighting, demonstrated by meeting the lighting criteria in Hea 02 Electric light. Shell only to demonstrate evidence of future provision.
5. Lighting must be controlled to avoid out-of-hours use and operation during daylight hours when natural light suffices.
6. Cycle storage that is only suitable for folding bicycles or scooters is not compliant.

> BREEAM is not prescriptive about the cycle storage dimensions and type required to demonstrate compliance. The assessor is expected to exercise their professional judgement to determine whether the cycle parking spaces meet the aims of Tra 02 and the requirements listed.
>
> BREEAM is used to certify buildings, not products. Therefore, cycle parking systems are not inherently 'BREEAM compliant'. These must be assessed in the context of their location and intended user profile.

Compliant changing facilities

Compliant changing facilities are defined as those that meet the following:

1. Changing areas must be appropriately sized for the likely or required number of users. The assessor should judge whether the changing area is sufficient based on the number of showers or number of cycle storage spaces provided.
2. Private spaces (not toilets or showers – see 4 below) must be provided for cyclists of any gender to change.
3. Changing areas must include adequate space and facilities to hang or store clothing and equipment while changing or showering, e.g. bench seat or hooks.
4. Toilet or shower cubicles cannot be counted as changing facilities

Compliant drying spaces

A compliant drying space is defined as one that is specifically designed and designated for this purpose. It should have suitable finishes, adequate heating and ventilation, and the facility to hang wet clothes with sufficient air movement around them to dry effectively.

Examples of non-compliant spaces include:

— Plant rooms: their use as a drying space may create a health and safety hazard.

— Coat hooks in cloakrooms or staff changing areas are unlikely to provide adequate ventilation to dry clothing effectively.

Compliant lockers

Compliant lockers are defined as:

1. Sized appropriately for the storage of cyclists' equipment.
2. Adjacent to compliant changing rooms, where provided.
3. The number of lockers is at least equal to the number of cycle spaces required.

Compliant showers

Compliant showers are defined as follows:

1. One shower is provided for every 10 cycle storage spaces, subject to a minimum of one. Any building with eight or more showers complies regardless of the number of cycle storage spaces provided.
2. Showers must cater for both male and female users. Either separate showers within gender-specific facilities (required split 50:50) or single shower cubicles and mixed-use changing spaces. The assessor can consider a deviation from the 50:50 split guidance if justified by occupancy data, or if design teams want a flexible shower arrangement for all users.
3. The showers do not need to be dedicated to cyclists and can be shared with other users or uses.

Dedicated transport service

A dedicated transport service, such as a dedicated bus, coach, or minibus, provided or managed by the building owner or management, can be considered for any building type with a fixed usage pattern. The dedicated transport must provide a transfer to the local population centre or public transport interchange, or it may be a door-to-door service.

Generally, a dedicated service must be available to all regular building users. However, for primary and secondary schools, a dedicated service available to students only can be considered compliant.

Electric vehicle charging infrastructure (EV charging infrastructure)

EV charging infrastructure refers to the network of facilities and equipment designed for charging EVs. This includes:

1. **Active EV charging infrastructure:** specifically designated locations within a parking space with fully installed and functional EV charging points.
2. **Passive EV charging infrastructure:** parking spaces that have the necessary groundwork in place, including cable routes, electrical conduits, and electrical supply capacity in the distribution system to accommodate the future installation of cables and EV charging points.

Large retail

This refers to large retail developments, such as shopping centres, retail parks and supermarkets, which typically will have covered or uncovered parking, or external areas, and therefore scope to provide their own dedicated cyclists' storage.

Safe pedestrian route

Safe pedestrian routes include pavements, paths, and safe crossing points. The distance must not be measured in a straight line but along an actual walking route.

Priority spaces

Priority spaces are parking spaces designated for users with specific needs, such as people with disabilities, parents with young children, or others who require enhanced accessibility and convenience.

Rural location

This includes any building type for which a rural population has a demonstrable social or economic local need. A rural location is defined as an area outside an urban cluster. Sparse settlements and low population density commonly characterise these areas. Rural locations may face challenges due to limited infrastructure and transportation options. People living in rural areas may be content with longer travel distances and limited access to services and amenities, necessitating greater distances for essential needs.

You may refer to the local government's guidance on classifying rural locations.

Small retail

Smaller retail units or shops that may form part of a wider retail or business district, city or town centre, or mixed-use sites, and typically do not have the scope to provide their own dedicated cyclists' storage.

Additional information

Default occupancy rates by building type

Table 61 below provides default occupancy rates for various building types if the number of building occupants commuting to the development cannot be confirmed (see M2.1). Select the most appropriate.

Table 61: Default occupancy rates by building type

Building type and function area	Occupant density
Business	
Office area (including reception areas)	0.111
Food preparation area (staffed)	0.108
Small workshop or category lab space	0.050
Industrial	
Food preparation area	0.213
Industrial process area	0.050
Laboratory	0.050
Reception	0.110
Warehouse storage	0.050
Generic office area	0.108
Hospitals, care homes	
Reception	0.152
Post-mortem facility	0.050
Food preparation area	0.161
Physiotherapy studio	0.200
Bedroom unit	0.105
Laundry	0.117
24-hours consulting or treatment areas	0.07
Assembly areas or halls	1.000
Hydrotherapy pool hall	0.100
Industrial process area	0.124
Laboratory	0.080
Operating theatre	0.125
Classroom	1.000
Diagnostic imaging	0.100
Generic ward	0.175

Building type and function area	Occupant density
Office and consulting area	0.195
Primary healthcare	
Reception	0.110
Office and consulting areas	0.082
Further and higher education	
Residents bedroom	0.120
Classroom	0.203
Food preparation area	0.096
Hall, lecture theatre or assembly area	0.202
Computer laboratory	0.231
Laboratory	0.106
Laundry	0.105
Reception	0.112
Workshop – small scale	0.068
Office and consulting areas	0.103
Hotels	
Bedroom	0.050
Food preparation area	0.108
Reception	0.105
Generic office area	0.106
Secure residential institution	
Cell	0.190
Reception	0.121
Hall, lecture theatre or assembly area	0.183
Eating and drinking area	0.141
Workshop – small-scale	0.048
Laundry	0.086
Classroom	0.183
Office and consulting areas	0.093
Food preparation area	0.111
Libraries, museums, galleries	
Reception	0.095
Food preparation area	0.176
Hall, lecture theatre or assembly area	0.150
Laboratory	0.098
Workshop – small-scale	0.062
Display and public areas	0.150
Generic office area	0.099
General assembly and leisure, clubs, theatres	
Dry sports hall	0.047
Fitness studio	0.132
Fitness suite or gym	0.170
Food preparation area	0.131
Hall, lecture theatre or assembly area	0.175
Auditorium	0.341
Ice rink	0.225
Performance area (stage)	0.049
Public circulation areas	0.241
Reception	0.126
Sales area – general	0.102

Building type and function area	Occupant density
Swimming pool	0.163
Workshop – small-scale	0.067
Generic office area	0.116
Community or day centres	
Reception	0.108
Dry sports hall	0.047
Food preparation area	0.143
Workshop – small scale	0.064
Hall, lecture theatre or assembly area	0.169
Office and consulting areas	0.106
Other	
Data centre	0.096
Server room	0.096
Heavy plant room	0.096

Notes

1. The net floor area for each function must be multiplied by the equivalent occupant density to determine an overall occupancy for the function area.
2. Not all potential building areas are listed, only those required to reflect estimated building occupancy for the building type. For example, an office building may have a canteen but it will be the staff that predominantly use the canteen. The office staff numbers will be estimated using the default occupancy rate for the office area; therefore to include the canteen would result in double counting of occupancy.
3. If a building type is not listed, occupancy rates for a similar building type or function area may be used.
4. The above occupancy rates have been sourced from the activity database of the Simplified Building Energy Model (SBEM), v.5.4a.
5. If the occupancy rates produced are unrealistic, please refer to the alternative option to provide the number of occupants (see M2.1).

Water



Summary

This category encourages sustainable water use in the operation of the building and its site. Issues in this section focus on identifying means of reducing potable water consumption (internal and external) over the lifetime of the building and minimising losses through leakage.

Assessment issues

Wat 01 Water consumption	up to 2 credits
Wat 02 Water monitoring	-
Wat 03 Water leak detection and prevention	1 credit
Wat 04 Water efficient equipment and systems	1 credit
Wat 05 Prediction of operational water consumption	-

Wat 01 Water consumption

(all buildings)

Aim

To reduce the operational water consumption for sanitary uses in buildings by installing water efficient components and rainwater collection and water recycling systems.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	up to 2	Good, Outstanding	All (see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	This issue is filtered out where there will be no in-scope water-using components included in the fit out.

Building type specific notes

Ref	Building type specific note
2.0	**Healthcare buildings** Water-using components in clinical areas do not need to be assessed. Components in non-clinical areas may also be excluded where they are not appropriate for the needs of patients or may adversely affect the incidence and propagation of infections, where justified by an appropriate health professional. Where all water fittings are excluded from assessment the minimum standard is not applicable.

Assessment criteria

Up to two credits – Water consumption

1 Determine the water efficiency of all in-scope water-consuming components that are installed or renovated as part of the fit out.

2 Determine the amount of recycled water expected from approved blackwater, greywater, and rainwater systems that are installed as part of the fit out.

3 The number of credits available is determined by the percentage of the building's water consumption that is included in the scope of the assessment and the credits awarded is determined by the percentage improvement in potable water use in litres per person per day for replaced water-consuming compared to baseline components as shown in Table 62 below.

Table 62: Water consumption credits

Percentage total building water consumption	Credits available	Percentage improvement over baseline	Number of credits	Minimum standard
> 0%	1	≥ 15%	0	Good
		≥ 30%	1	Outstanding
≥ 20%	2	≥ 15%	0	Good
		≥ 30%	1	Outstanding
		≥ 50%	2	-

Methodology

M1: In-scope water-consuming components

Identify which of the following sanitary water-consuming components are included in the fit-out project:

- WCs/toilets
- Urinals
- Taps/faucets (on wash-hand basins, kitchen sinks and waste disposal units)
- Showers
- Baths
- Dishwashers (domestic and commercial-sized)
- Washing machines (domestic and commercial sized)

For any of the above water fittings that are installed or renovated, information on the types of water-using components present and the number of each type of water-using component should be entered into the BREEAM Platform. For components that are replaced or upgraded in the project specification, the water efficiency of each component type should be entered. Where the water efficiency is not known, the baseline water efficiencies will be assumed.

M1.2: Out of scope water-consuming components

Where one or more of the following conditions apply to any water-consuming component, they may be excluded from the scope of this Issue:

1. They are used for a process related function, scrub-up taps, cleaners' sinks etc.
2. They are specialist water components, e.g. specialist assisted baths.
3. They are used in religious practices, e.g, low level ablution taps.

M2: Data requirements

M2.1: Data requirements for water-consuming components

The data required for each type of water-consuming component is shown in Table 63 below.

Table 63: Data requirements for each type of water-consuming component

Water-consuming component	Data requirements
WCs/toilet	Full flush and, where applicable, reduced flush volume in litres per use
Urinal	Flush volume in litres/bowl/hour
Washbasin taps/faucet	Maximum flow rate in litres per minute, including any reduction achieved with flow restrictors [note 1]
Shower	Maximum flow rate in litres per minute, including any reduction achieved with flow restrictors
Kitchen tap	Maximum flow rate in litres per minute, including any reduction achieved with flow restrictors
Bath	Capacity to overflow in litres [note 2]
Dishwasher – domestic sized	litres/cycle
Dishwasher – commercial sized	litres/rack
Washing machine – domestic sized	litres/use (based on a typical wash cycle)
Washing machine – commercial sized	litres/kg
Waste disposal unit	Flow rate in litres per minute

Notes

1. The flow rate of a tap or shower will vary depending on the water pressure:
   - For high pressure supply systems, test measurements should be undertaken at 3 ± 0.2 bar (0.3 ± 0.02 MPa).
   - For low pressure supply systems, test measurements should be undertaken at 0.1 ± 0.02 bar (0.01 ± 0.002 MPa).

2. The calculation of water consumption for baths assumes 40% of the capacity to the overflow. This is to reflect that:
   - Users tend not to fill the bath to overflow.
   - The displacement effect the user has on the actual volume of water required for a bath.

M2.2: Calculating flow rates for push and automatic shut-off taps

The water consumption of push and automatic shut-off taps using the following steps:

1. Calculate the water consumption per person per use. If a tap runs for less than 20 seconds per activation, assume it will be activated twice per person for the timed duration.

   For example, for a tap with a flow rate of 9 litres/min and a 15 second usage duration, the water consumed per person would be: 9 × (15/60) × 2 = 4.5 litres/min.

   If a tap runs for 20 seconds or more per activation, assume one activation per person for the timed duration.

   For example, for a tap with a flow rate of 9 litres/min and a 20 second usage duration, the water consumed per person would be: 9 × (20/60) × 1 = 3 litres/min.

2. Multiply the water consumption figure per person by 1.5 and enter this figure into the calculator tool.

   Multiplying by 1.5 adjusts the consumption figure to compensate for the typical non-timed tap use of 40 seconds that has already been taken into account in the tool. Taking the first example above, 4.5 litres/min multiplied by 1.5 gives 6.75 litres/min. When this is used in the tool as the flow rate specification, the consumption is 4.57 litres/person/day which more closely reflects the true level of water consumption for the push tap.

M2.2.1: Flow rate for a mixture of taps

Where there is a mixture of taps used, whichever is the higher of the 'average flow rate' or the 'proportionate flow rate' should be used within the BREEAM Platform.

M2.2.2: Flow rate for a shower with multiple heads

To calculate the water use of a shower with more than one shower head, one of the following should be done:

— If all of the shower heads can be turned on at once, the flow rates should be added up.

— If the shower heads can only be used one at a time, the highest flow rate should be used.

M2.2.3: Calculation of litres/bowl/hour for urinals

A flushing frequency of two flushes per hour is used in the BREEAM Platform and should be applied when calculating the volume of water dispensed by urinals and compared against the water efficient consumption levels by component type for the Wat 01 issue. This method should be applied to calculate litres/bowl/hour.

For example, a 13.5 litre cistern feeding 3 bowls which is flushed 2 times per hour:

(13.5 litres / 3 bowls) × 2 times an hour = 9 litres/bowl/hour

M2.2.4: Calculating flow rates for showers and taps where use is physically time-limited

Where a timer is used to physically limit the use of showers or taps within a set period of time, this can be used as the basis for calculating a reduced flow rate.

For example, where use is limited to 2 minutes, 4 times per hour, for a shower or tap with a flow rate of 8 litres per minute, the flow rate can be calculated as follows:

8 litres/min × 8 min/hour = 64 litres/hour = 1.07 litres/min

M2.3: Data requirements for blackwater, greywater, and rainwater systems

Where blackwater, greywater, and rainwater systems are installed as part of the fit-out the following information must be entered into the BREEAM Platform:

For blackwater and greywater systems:
The percentage volume of wastewater collected (and reused) from the following where relevant: wash-hand basins, showers, kitchen sinks, dishwashers, baths, washing machines and sources of wastewater from non-domestic components.

For rainwater systems:
Either

— Horizontal projection of the collection area (m²)
— Surface yield co-efficient (%)

- Hydraulic treatment efficiency co-efficient (%)
- Annual local rainfall (mm/year)

OR

- Daily rainfall collection (litres)

Daily rainfall collection (litres) must be calculated in accordance with credible and verifiable national or local data, e.g. a regional, national or international meteorological organisation, data source or equivalent.

M3: Calculating water performance credits

The water consumption of the building is calculated in litres per person per day based on the data inputs for water-consuming components based on a default occupancy pattern determined by the building type.

Fittings that are added, replaced or upgraded should use the actual performance data for each fitting.

Where the assessment consists of multiple building types, a tailored occupancy pattern is generated for the building based on the floor area for up to five different building types.

Where blackwater, greywater, or rainwater systems are included in the fit-out scope, their yield is used to offset non-wholesome water demand from components that would otherwise be from water supplied via public or private networks and/or abstracted from local water sources.

The baseline building has the same number of each type of water-consuming component present as the actual building. The baseline building is taken to have the same occupancy assumptions as the actual building, no waste-water systems installed, and with water-consuming components with baseline performance levels set as follows in Table 64 below.

Table 64: Baseline performance levels for water-consuming components

Water consuming component	Baseline performance level
WCs/toilet	6.0 litres effective flush volume
Urinal	8.75 litres/bowl/hour
Washbasin taps/faucet	10 litres/minute
Shower	12 litres/minute
Kitchen tap	10 litres/minute
Bath	200 litres
Dishwasher – domestic sized	17 litres/cycle
Dishwasher – commercial sized	8 litres/rack
Washing machine – domestic sized	90 litres/use
Washing machine – commercial sized	14 litres/kg
Waste disposal unit	17 litres/minute

The water performance (litres/person/day) for the actual building and the baseline building are calculated within the BREEAM Platform which also determines the number of credits awarded in accordance with Table 62 on page 210. Where water-consuming components have a worse performance than the baseline level, the baseline as specified in Table 64 above should be entered into the BREEAM Platform.

Compliance notes

Ref	Terms	Description
CN1	Flow rate for click taps	The flow rate for click taps shall be taken as the maximum flow rate, as quoted by the manufacturer, of the lower range before the water break or 'click'.
CN2	Washer dryers	Where a washer dryer is specified, the water consumption figure for the wash and dry cycle should be used. The drying cycle of a washer dryer is taken into account because it usually uses water during this drying process (e.g. for cooling during the drying cycle) and in some cases, this water usage can be significant.

Evidence

Criteria	Interim design stage	Final post-construction stage
All	The relevant sections or clauses of the building specification, design drawings or schedules confirming the number, specification and water consumption of all water-consuming components. Where specific products are specified, manufacturer's literature, EU Energy Label or European Unified Water Label information must be provided to support the water consumption values used. Technical details for blackwater, greywater, or rainwater collection systems, where specified. Calculations e.g., relating the flow rate for push and automatic shut off taps or for blackwater, greywater, or rainwater collection systems.	Final construction drawings or sanitaryware schedule to confirm the number and type of water-consuming components installed. Assessor site inspection report with photographic evidence or proof of purchase such as purchase orders to confirm that the fittings have been installed as specified. Copy of the manufacturer's product details, EU Energy Label or European Water Label to confirm water consumption for all installed products. Technical details and calculations for installed blackwater, greywater or rainwater collection systems.

Definitions

Blackwater recycling

The appropriate collection, treatment and storage of wastewater discharged from kitchen and utility sinks, urinals and toilets to meet a non-wholesome water demand in the building, e.g. WC flushing, or other permissible non-wholesome water use on the site of the assessed building.

Click taps

Taps where the flow volume has more than one pre set level rather than permitting continuous adjustment.

Clinical areas

Areas of the building in which medical functions are carried out that require specific restricted environmental conditions, affecting factors such as such as humidity, daylighting, temperature etc. (e.g. X-ray, operating department, delivery room etc.).

Effective flush volume

The effective flush volume of a single flush WC is the volume of water used for one flush. The effective flush volume of a dual flush WC is the ratio of full flush to reduced flush. This is taken to be one full flush for every three reduced flushes for non-domestic buildings and one full flush for every two reduced flushes in domestic (residential) buildings or areas. The effective flush volume can therefore be calculated as follows, using a 6/4 litre dual flush volume WC as an example:

- Non-domestic: {(6 litre × 1) + (4 litre × 3)}/4 = 4.5 litre effective flushing volume (for a 6/4 dual flush WC)
- Domestic: {(6 litre × 1) + (4 litre × 2)}/3 = 4.67 litre effective flushing volume (for a 6/4 dual flush WC).

The differing ratio between non-domestic and domestic buildings reflects the different patterns of user behaviour between these building types.

Where buildings have both domestic and non-domestic function areas, conduct the calculations accordingly for the WCs specified in the relevant spaces. For example, in a hotel building, for WCs in hotel rooms use the 'domestic' effective flush volume calculation and for WCs in staff areas use the 'non-domestic' calculation.

Greywater recycling

The appropriate collection, treatment and storage of wastewater discharged from baths or showers, laundry rooms and similar to meet non-wholesome water demand in the building, e.g. WC flushing, or other permissible non-wholesome use on the site of the assessed building.

Hydraulic filter efficiency

This recognises the efficiency of the hydraulic filter. Where the coefficient for the system is not known a default value of 90% may be used.

Proportionate flow rate

The proportional flow rate can be calculated for multiple tap that takes account of the expected usage of each tap type.

Rainwater recycling

The appropriate collection and storage of rainwater run-off from hard outdoor surfaces to meet a non-wholesome water demand in the building, e.g. WC flushing, or other permissible non-wholesome water use on the site of the assessed building.

Surface yield coefficient

This recognises that some rainwater is lost due to splashing, evaporation, leakage, overflow and other factors and will vary depending on the surface from which the rainwater is collected. Where the coefficient for the system is not known a default value of 90% may be used.

Wholesome water

Water suitable for human consumption that meets the requirements of Section 67 (Standards of Wholesomeness) of the Water Industry Act 1991 is referred to as 'wholesome water'.

Additional information

Limitations of water consumption calculation

The building water use calculation uses default usage and occupancy rates to provide a benchmark of the typical consumption based on the specified fittings (in litres/person/day and m^3/person/year). Due to differences between the actual user behaviour and occupancy rates compared to the default values, the results of the method will not reflect the actual water use during building operation. Therefore, the results from the methodology should not be used to predict actual water consumption from a non-domestic building.

European Unified Water Label

The European Unified Water Label is a scheme initiated by bathroom manufacturers across the globe and it provides a database of bathroom products of different levels of water efficiency. It includes products by multiple European bathroom manufacturers and can help project teams identify products appropriate for their specifications. Find out more at: uwla.eu

Wat 02 Water monitoring

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Wat 03 Water leak detection and prevention

(all buildings)

Aim

To reduce the impact of water leaks that may otherwise go undetected.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All (see ref 2.0, 2.1, 2.2, and 3.0)

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
2.0	**Healthcare** Flow control devices criteria are not applicable to toilet facilities in clinical areas.
2.1	**Residential institution** The credit for the specification of flow control devices in WC areas or facilities does not apply to ensuite facilities in residential areas. For example: ensuite facilities in individual private bedrooms and a single bathroom for a collection of individual private bedrooms in halls of residence, key worker accommodation or sheltered accommodation.
2.2	**Short term stay residential institutions (such as hotels)** The credit for the specification of flow control devices in WC areas in hotel rooms can be achieved through providing the required flow control devices to groups of 10 rooms, rather than to each individual room.

Issue specific notes

Ref	Issue specific note
3.0	Where the scope of the fit out does not include any new or refurbished WC areas, the whole issue is filtered out.

Assessment criteria

One credit – Flow control devices

1 Flow control devices that regulate the supply of water to each WC area or facility according to demand are installed.

Methodology

M1: Flow control devices

For Part 2, criterion 1 only applies to WC areas in common areas, whilst for Part 3, criterion 1 only applies to WC areas in other areas of the building.

The criteria are applicable to the cold water supply only and include cold taps, WCs and urinals. Any solution implemented to achieve compliance with this issue should effectively mitigate the risk of hot-water scalding in showers, in the event that the cold water supply is shut off.

Flow control systems may control combined WC areas, such as male and female toilets within a core; they are not required for each individual sanitary appliance. However, all WCs must have either individual or block and group flow controls. The criteria are set to encourage the isolation of the water supply to each WC block when not in use.

The flow control criterion for this issue does apply to facilities which have only a single WC (potentially within smaller or low occupancy buildings). In these instances shut-off could be provided via the same switch that controls the lighting (whether proximity detection or a manual switch).

The following types of flow devices meet the criteria:

- A time controller, i.e. an automatic time switch device to switch off the water supply after a predetermined interval.
- A programmed time controller, i.e. an automatic time switch device to switch water on or off at predetermined times.
- A volume controller, i.e. an automatic control device to turn off the water supply once the maximum pre-set volume is reached.
- A presence detector and controller, i.e. an automatic device that switches water on and off, depending on the detection of occupancy or movement.
- A central control unit, i.e. a dedicated computer-based control unit for the overall management of a water control system, utilising some or all the types of control elements listed above.

Compliance notes

Ref	Terms	Description
CN1	Building safety-critical systems, such as sprinklers and fire hydrants	For building safety-critical systems, such as sprinklers and fire hydrants, it may not be possible to fully meet the criteria. Where this is confirmed by an appropriate project team member, alternative approaches can be used. These must show how they meet the aim of the issue by detecting and alerting building management to major leaks.

Evidence

Criteria	Interim design stage	Final post-construction stage
All	The relevant sections or clauses of the fit out specification or contract. Design drawings or metering schematics. Where available, manufacturer's product details.	Assessor's site inspection report and photographic evidence. Final construction drawings or equivalent. Manufacturer's product details.

Definitions

Clinical areas

Areas of the building in which medical functions are carried out that require specific restricted environmental conditions, affecting factors such as humidity, daylighting, temperature etc. (e.g. X-ray, operating department, delivery room etc.).

WC areas or facilities

WC areas or facilities refers to cold water supply to taps, WCs, and urinals. The water supply system must not allow the cold water to automatically switch off in the showers while the hot water is still running to avoid scalding from hot water.

Additional information

None.

Wat 04 Water efficient equipment and systems

(all buildings)

Aim

To recognise and encourage the procurement of water efficient equipment and systems for applications other than sanitary use in buildings to reduce water consumption in operation.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All (see ref 3.0)

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	This issue will be filtered out where there are no new or renovated water using systems and equipment that use significant amounts of water for non-sanitary purposes included within the scope of the assessment included within the scope of the fit out.

Assessment criteria

Up to two credits – Water efficient equipment and systems

1 Identify systems and equipment that use significant amounts of water for non-sanitary uses that are included in the scope of assessment fit out (see M1).

2 Demonstrate installed non-sanitary water-using systems and equipment are water efficient (see M2).

3 Demonstrate that the percentage of non-sanitary water demands that are provided by water efficient equipment is > 50%.

Methodology

M1: Scope of non-sanitary water-using systems and equipment

The scope of water-using systems and equipment to be considered for this issue are those that are not assessed under Wat 01 Water consumption.

This includes but is not limited to:

- Swimming pools
- Recreational hot tubs and hydrotherapy pools
- External planting
- Water features
- Vehicle wash stations
- Cooling towers
- Systems that use water for cooling or heating
- Other systems and water-using components with an estimated water consumption of 1000 litres per year or more

Unless one or more of the following conditions apply:

1. They are part of an industrial process.
2. They provide temporary services.
3. They are only used when maintenance work is being carried out.
4. They are only used in an emergency.
5. There are overriding safety, security or accessibility requirements that prevent water efficiency criteria being met by any relevant compliance routes.
6. The equipment or system is a bespoke (unique) item that has been made specifically for the project and cannot be compared to standard equipment or systems.

Any water using equipment and systems that are included as part of the fit out must be included in the scope of the assessment

Water-using systems and equipment for non-sanitary water uses may be excluded from the assessment where the additional cost of procuring water efficient systems or equipment is expected to exceed the cost savings from reduced water consumption over the lifetime of the system or equipment.

This is more likely to be the case for items with low annual water consumption.

M2: Estimating non-sanitary water used by in-scope systems and equipment

Water consumption estimates may be derived from engineering calculations, data for similar projects, benchmarks or other approximate estimation methods, or metered water consumption. For existing systems and equipment that fall within the scope of the assessment metered data may be used directly. Where systems or equipment have been replaced or refurbished metered data should be adjusted based on justified assumptions about the reduction in water consumption.

For example, a simple engineering calculation for a swimming pool might take account of the surface area of the pool and the evaporation rate, which will be determined by the difference between the water temperature and the air temperature and the ventilation rate.

The estimated annual water consumption for each in-scope system or type of equipment must be entered in the BREEAM Platform.

At the pre-assessment stage, the number of credits available may be estimated by entering a rough estimate of the total water consumption for all in-scope systems and equipment. This must be replaced by estimates of the water consumption for each system or item of equipment before the assessment is submitted. Where metered data is used, water consumption may be entered for multiple systems and equipment items.

M3: Demonstrating water efficiency

There are two routes for determining whether an item of equipment or system is water efficient:

1. Where the equipment or systems are more water efficient than that of a standard version of the equipment or system (see M3.1).

   OR

2. Where the equipment or system meets specific "deemed to comply" water efficiency requirements (see M3.2).

Deemed to comply water efficiency requirements are only provided for some types of systems and equipment.

Where deemed to comply requirements exist, the water efficiency compared to a standard version of the system or equipment may be used to demonstrate compliance with this issue.

M3.1: Demonstrating water efficiency compared to a standard version of the system or equipment

The reduction in water consumption must be calculated based on the expected annual water consumption for the actual system or item of equipment compared to annual water consumption of a standard system or item of equipment. In both instances, the system or item of equipment must meet the same water service demand.

A standard item of equipment is defined as having a water efficiency that is typical for that type of equipment. This means that it has:

- Water-using components with water efficiency that is typical for the component types.
- Water efficient features and controls that are typical for the system type.
- Not been designed to optimise water consumption.

The performance of a standard version of a system or equipment type might be determined based on a non-exhaustive search for systems or products of the same type.

To demonstrate that the actual equipment or system procured is more water efficient than the standard version, show that the performance of the actual equipment or system achieves a meaningful reduction in water consumption compared to the standard version.

Where technical data on both the actual and standard version of the system is readily available, this should be used to calculate the percentage reduction in water consumption. This calculation, alongside justification for both the selection of the standard product and the acceptance of the achieved percentage reduction over the standard product as meaningful, should be provided in each case to demonstrate that a given system is water efficient.

Note: The percentage reduction in water consumption does not impact the number of credits awarded.

M3.2: Deemed to comply requirements for water-using systems and equipment

Deemed to comply requirements for specific non-sanitary water-using systems and equipment are listed in Table 65 below.

Table 65: Deemed to comply requirements for non-sanitary water-using systems and equipment

Type of system or equipment	Requirements
Swimming pools	Automatic or semi-automatic pool covers, or 'liquid' pool covers with an automatic dosing system, are fitted to the entire pool surface area. AND For indoor pools: The air temperature in the pool hall can be controlled so that it is 1°C above the water temperature. OR For outdoor pools: Wind barriers, such as fencing, rocks, or shrubbery are used to reduce evaporation.
Recreational hot tubs and hydrotherapy pools	Automatic or semi-automatic pool covers, or 'liquid' pool covers with an automatic dosing system, are fitted to the entire pool surface area.
Planting and landscaping	Watering is by a controlled irrigation system that uses local weather data or soil moisture sensors. OR Reclaimed or recovered water from a rainwater collection or waste-water recovery system with appropriate storage, i.e. greywater collection from building functions or processes that use potable water, e.g. vehicle wash, sanitary facilities, irrigation etc. is used in preference to other water sources. OR External landscaping and planting that relies solely on precipitation, during all seasons of the year once the planting has been established (see CN1).
Water features such as decorative fountains	Automatic switch off during unoccupied hours. OR Wind barriers, such as fencing, rocks, or shrubbery are used to reduce evaporation.
Vehicle wash stations	Fitted with a water recycling system. OR Uses rainwater or waste-water.

Type of system or equipment	Requirements
Cooling towers	Automatic blowdown control which regulates when blowdown is discharged. OR Fitted with a windbreak, floating covers, or other types of enclosure.
Systems that use water for cooling or heating	Uses a closed loop water circulation system.

Compliance notes

Ref	Terms	Description
CN1	Temporary irrigation systems	Temporary watering arrangements set up purely to allow plant species or a green roof to establish are acceptable for plants relying on natural precipitation during all seasons of the year. Where this is the case, the ecologist's report must confirm the plant species and the expected time for recommended plant species to establish themselves i.e. time period for temporary watering arrangements.
CN2	Manual watering	Where the design team can justify that manual watering provides a reduction in unregulated water consumption, this can be considered as an acceptable method for reducing unregulated water use.
CN3	Using water from natural underground sources to offset water consumption	Water from natural underground sources (for instance aquifer water accessed via boreholes) cannot be used to offset water consumption. A significant amount of water used for public consumption is already drawn from aquifers. Private boreholes may be drawing water from the same sources as public utility companies.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Design drawings, relevant sections of the building specification, schedules or other documentary evidence identifying all water demands from uses other than domestic scale drinking and sanitary use components, as per M1. Where items with low annual water consumptions have been excluded from the scope due to the cost of replacement, this must be stated and justified.	Final construction drawings or equivalent, assessor site inspection report and photographic evidence or other documentary evidence to verify all water demands from uses other than domestic scale drinking and sanitary use components, as per M1, that have been installed. Where items with low annual water consumptions have been excluded from the scope due to the cost of replacement, this must be stated and justified.
2	Calculations and data sources used to demonstrate the estimated annual water consumption of systems and equipment, as per M2 and M3.	Final calculations and data sources used to demonstrate the estimated annual water consumption of installed systems and equipment, as per M2 and M3.
3	Where compliance demonstrated by comparison to a standard version of the system or equipment, acceptable evidence sources include: — Written justification for the selection and benchmarking of the standard product based on reasonable assumptions or basic market research. — Specific clauses from reports or manufacturer's literature relating to the	Where compliance demonstrated by comparison to a standard version of the system or equipment, acceptable evidence sources include: — Manufacturer's literature relating to the water consumption of the actual installed systems or equipment — Final construction drawings / equipment schedules or equivalent, assessor site inspection report and

Criteria	Interim design stage	Final post-construction stage
	water consumption of the actual product. — Specific clauses from reports or manufacturer's literature relating to the water consumption of the standard product. Plus: — Where available, calculations showing that the actual product is more water efficient than the standard product. Where a percentage reduction in water consumption has been accepted as signifying a meaningful reduction in water efficiency, then this should be stated and justified. Where this is demonstrated by meeting the deemed to comply requirements within Table 65, acceptable sources of evidence include: — Relevant sections of the building specification, systems or equipment schedules or contract clauses. — Where products are specified, manufacturer's product details confirming they meet the deemed to comply requirements.	photographic evidence or proof of purchase to verify installed systems or equipment. Plus: — Calculations showing that the actual product has a lower water consumption than the standard product. Where a percentage reduction in water consumption has been accepted as signifying a meaningful reduction in water efficiency, then this should be stated and justified. Where compliance is demonstrated by meeting the deemed to comply requirements, acceptable evidence sources include: — Final construction drawings / equipment schedules or equivalent, assessor site inspection report and photographic evidence or proof of purchase to verify installed systems or equipment. — Manufacturer's literature showing the equipment includes the deemed to comply requirements.

Definitions

Non-sanitary water uses

All operational water uses within the curtilage of the building **except** for:

- WCs/toilets
- Urinals
- Taps/faucets (on wash-hand basins, kitchen sinks, and waste disposal units)
- Showers
- Baths
- Dishwashers (domestic and commercial-sized)
- Washing machines (domestic and commercial sized)

Vehicle wash station

A commercial-scale automatic, semi-automatic, or manual system for washing vehicles. This includes wheel and chassis wash, fixed gantry and screen wash systems using brushes, spray or handheld jet hoses.

Additional information

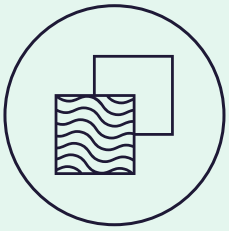
None.

Wat 05 Prediction of operational water consumption

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Materials



Summary

This category encourages steps taken to reduce the impact of construction materials through design, construction, maintenance and repair. Issues in this section focus on the procurement of materials that are sourced in a responsible way and have a low embodied impact over their life including extraction, processing and manufacture, and recycling.

Assessment issues

Mat 01 Building life cycle assessment	5 credits + 2 exemplary
Mat 02 Environmental product declarations	1 credit
Mat 03 Responsible sourcing of construction products	4 credits + 1 exemplary
Mat 05 Material efficiency	1 credit

Mat 01 Building life cycle assessment

(all buildings)

Aim

To optimise the use of materials and reduce the environmental burden of construction products over the life cycle of the building.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	5 + 2 exemplary	Excellent, Outstanding	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Two credits – Design stage LCA and embodied carbon reporting

1 Carry out a design stage LCA calculation from the materials that the project incorporates into the fit out. The LCA must:

1.a Meet the requirements for tools and scope given in M1.

1.b Include relevant options appraisals, including a baseline assessment. There are no requirements to carry out a specific number of options appraisals for the project.

1.c Be used as a basis for choosing design solutions and materials with the aim of achieving a low environmental impact. If an alternative solution with a lower environmental impact has not been chosen, then this must be justified.

2 From the design LCA results (criterion 1), report the embodied carbon emissions from materials used in the fit out. Results must be reported using the BREEAM Platform. To ensure consistency follow the requirements in M2.

One credit – Technical design LCA and embodied carbon reporting

3 Carry out a technical design phase LCA calculation from the materials that the project incorporates into the fit out. The LCA must:

3.a Meet the requirements for tools and scope given in M1.

3.b Include at least one assessment showing the evolving design and specification at technical design.

4 From the technical design LCA results (criterion 3), report the embodied carbon emissions from materials used in the fit out. Results must be reported using the BREEAM Platform. To ensure consistency follow the requirements in M2.

Two credits – Post-construction LCA and embodied carbon reporting

5 Carry out a post-construction phase LCA calculation from the materials that the project incorporates into the fit out. The LCA must:

5.a Meet the requirements for tools and scope given in M1.

5.b Include as-built specification at post-construction.

6 From the post-construction LCA results (criterion 5), report the embodied carbon emissions from materials used in the fit out. Results must be reported using the BREEAM Platform. To ensure consistency follow the requirements in M2.

One exemplary credit – Third party verification

7 A suitably qualified third party verifies the LCA work. The suitably qualified third party must:

7.a Produce a report describing how they have checked that the LCA work accurately represents the designs under consideration for the:

7.a.i Design phase, and

7.a.ii Technical design phase, and

7.a.iii Post-construction phase (only relevant if criteria 5 to 6 have been targeted)

7.b Itemise in the report the checks made for each LCA option. As a minimum, this must include the quality requirements shown in Table 66 in M3.

7.c Include in the report details of their relevant skills and experience and a declaration of their third-party independence from the project client and design team.

8 Any recommendations in the third-party verification report must be resolved and evidenced.

One exemplary credit – Embodied carbon public data disclosure

9 For each project phase where an LCA has been conducted, submit the LCA or carbon results and data to a relevant publicly available LCA or carbon database. If suitable local or national options are not available, submit to the Built Environment Carbon Database (BECD).

Methodology

M1: LCA and embodied carbon methodology and scope

The following sets out the minimum requirements and the scope of the LCA and embodied carbon calculations. For further guidance on the information below, please refer to Guidance Note 51.

M1.1: Tools

The project must use an LCA tool recognised by BREEAM. A list of these can be found in KBCN1118. These are LCA tools that are technically evaluated and deemed suitable for carrying out building LCA for this issue. Where a project team is considering using a building LCA tool that is not yet recognised by BREEAM, the assessor shall contact BRE as soon as possible to initiate the evaluation process. This process requires time and a fee, as well as the involvement and evidence from the tool owner.

To apply for a new tool to be evaluated, please contact: breeam@bregroup.com.

M1.2: Environmental indicators

Results must be submitted for all core environmental impact indicators that the tool or data permits. Indicators specified in EN 15978[59] and EN 15804[60] must be used. All BREEAM recognised LCA tools comply with EN 15978 and EN 15804 and offer a suitable range of indicators for reporting. There is no requirement for this to be submitted in a specific format as long it includes all the relevant indicators.

M1.3: Life cycle stages

The following life cycle modules must be covered (based on EN 15978):

— Modules A1–A5: Product sourcing and construction stage.

— Modules B1–B5: Use stage (excluding B6–7).

— Modules C1–C4: End-of-life stage.

— Module D: Considering benefits and loads beyond the system boundary. This is required unless EN 15804:2019+A2 EPD data is not available for used products.

M1.4: Building elements

All building elements as set out in the BREEAM Platform that are within the scope of the assessment type must be included in any compliant LCA, whatever the project phase. The elemental breakdown structure of building elements is derived from RICS NRM 1 classification system level 2 and aligns with RICS Whole Life Carbon Assessment Standard, 2nd Edition. All BREEAM-recognised LCA tools automatically produce outputs aligned with the correct building elements' structure.

M2: Embodied carbon reporting

To ensure consistency in reporting, embodied carbon data must be completed in the BREEAM Platform as follows:

— Modules A1–A5, B1–B5, C1–C4 must be reported.

— Submit results in kilograms of CO_2e per square metre ($kgCO_2e/m^2$).

— For area measurements, use the Gross Internal Area (GIA) in square metres (m^2).

— Modules A1–A3 may be reported together.

— When possible, and if the tool used allows for it, report biogenic carbon from construction products (negative value) separately.

— Module D is required unless EN 15804:2019+A2 EPD data is not available for used products.

M3: Third party verification

For each LCA option, itemise in the report the checks made by the suitably qualified third party including, as a minimum, the quality requirements shown in Table 66 below. Additionally, the report should include an executive summary of the third-party verification findings.

The recommended best practice would be to conduct the third-party LCA verification at the end of each project stage, however this is not mandatory. It is, for example, acceptable for these to be verified as a single exercise, following post-construction. The third-party verification exemplary credit can still be achieved if the post-construction credits are not targeted (criteria 5 to 6). In this instance, verification only needs to be done at early design and technical design phase.

Table 66: LCA quality requirements

Item	Early design	Technical design	Post-construction
1. Elemental construction quantities	Estimates based on elemental benchmarks or design documents at early design stage.	Calculated quantities shown in design documents at technical design stage.	As-built quantities.
2. LCA or EPD data type	Generic or manufacturer specific data if specified.	In order of preference, the selection should go like this: 1. Product EPD from the manufacturer of the specific product you are planning to use, if available. 2. Generic data.	In order of preference, the selection should go like this: 1. Product EPD from the manufacturer of the specific product you used, if available. 2. Generic data.
3. Product quantities (mass per unit of elemental construction)	Typical or generic values. Generic (non-project specific) elemental constructions may be used.	± 10% of quantities shown in design documents at technical design stage. All elemental constructions shall be created from individual products.	As built quantities.
4. Product		Typical or generic values. Project-	Actual transport distances.

Item	Early design	Technical design	Post-construction
transportation distances		specific distances may be used where known.	
5. Product service lives		Typical or generic values or a reasonable estimate for the actual installation scenario.	Prediction of scenarios based on specific as-built data.
6. Site wastage	Typical or generic values.	Typical or generic values or a reasonable estimate.	Actual site wastage.
7. Site energy/water	Typical or generic values.	Typical or generic values or a reasonable estimate.	Actual site energy and water quantities.
8. Completion	Ensure all materials captured in the modelling are within the site red line boundary and EN 15978 / EN 15941 cut-off rules are applied (missing items must not add to more than 5% of the mass)		
9. Study period	Fit out project dependant	Fit out project dependant	Fit out project dependant
10. Recommendations	Ensure that the design team has provided feedback on design options and that these are documented.		-
11. Assumptions	Ensure that assumptions are clearly documented, including any data proxies, quantity and calculation assumptions and exclusions.		
12. Comparison with benchmark	Check that the benchmark comparison seems reasonable, large deviations from the benchmarks could be a sign of modelling errors, with under or over estimations.		
13. Outputs from LCA report	Results must be reported separately for each environmental indicator included. Modules A1–A5, B1–B5, C1–C4 must be reported (modules A1–A3 may be reported together). There is no requirement for the third-party LCA verification report to be submitted in a specific format as long it includes all the relevant information.		
14. GIA	Check modelled GIA is as referenced/calculated in design documentation. For offices, net internal area (NIA) can also be used as a secondary normalisation metric.		
15. Timing	Ensure that the LCA was completed at the correct time for the relevant life cycle stage.		

Compliance notes

None.

Evidence

Criteria	Interim design stage	Final post-construction stage
LCA and embodied carbon reporting		
1, 3	A copy of the LCA results or output report from the tool including all the requirements specified in M1. For the early design phase: Relevant options appraisals and baseline assessment. Evidence to demonstrate how the LCA has influenced the design.	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
2, 4	In the BREEAM Platform, report and submit the embodied carbon data for the early design phase and the technical design phase.	No further actions required post-construction; no additional evidence is required other than that listed for the design stage.
5	Relevant section or clauses of the Employer's Requirements, contract documentation or a letter of commitment from the client or developer to complete a LCA on the as-built specification at post-construction.	A copy of the LCA results or output report from the tool including all the requirements specified in M1.
6	Relevant section or clauses of the Employer's Requirements, contract documentation, or a	In the BREEAM Platform, report and submit the embodied carbon data for the post-

Criteria	Interim design stage	Final post-construction stage
	letter of commitment from the client or developer to report the embodied carbon at post-construction.	construction phase.
Third-party verification		
7, 8	Third-party report including all the requirements as per M3 with early design phase and technical design phase data. Evidence to confirm it was completed by a suitably qualified third party. Relevant section of the building specification or contract clauses or letter of commitment to carry out a third-party verification of the LCA at post-construction, and for early design phase and technical design phase LCAs where relevant.	Third-party report including all the requirements as per M3 with post-construction phase data, and early design phase and technical design phase data where completed post-construction. Evidence to confirm it was completed by a suitably qualified third party.
Embodied carbon public data disclosure		
9	Confirmation of registration and data submission from the relevant database for the early design phase and the technical design phase. Relevant section or clauses of the Employer's Requirements, contract documentation or a letter of commitment from the client or developer to register and submit data for the post-construction phase.	Confirmation of registration and data submission from the relevant database for the post-construction phase.

Definitions

Baseline assessment

A baseline LCA provides an initial assessment for comparison with subsequent assessments, facilitating the effective tracking of the project's environmental impacts as it advances through different phases.

Embodied carbon

The 'embodied carbon' emissions of an asset are the total GHG emissions and removals associated with materials and construction processes throughout the whole life cycle of an asset (Modules A1-A5, B1-B5, C1-C4).

Environmental Product Declaration (EPD)

For BREEAM compliance, an independently verified environmental label (i.e. ISO Type III label) according to the requirements of ISO 14025[61].

Options appraisals

Options appraisals or optioneering involves evaluating potential options to determine the most favourable solution, particularly during the early design phase. Partial LCAs can be conducted at this stage, focusing on major elements like structural components, to compare environmental impacts before final decisions are made. It is also important that a full project LCA is done during the early design phases to see where further improvements can be found at a strategic level while the design is still sufficiently flexible.

RICS New Rules of Measurement (NRM)

A standard set of measurement rules and guidance for the cost management of construction projects and maintenance works. For more information, visit www.rics.org.

Suitably qualified third party

For third-party verification, the verifier must demonstrate the following expertise and experience:

1. Knowledge of LCA sector including the following standards:
    a. EN 15978 *Sustainability of construction works. Assessment of environmental performance of buildings.*
    b. ISO 14040/14044

    This can be demonstrated by completing an appropriate training course. Examples of some available training courses are provided in Additional information below.
2. Completion or verification of five different LCAs for paying customers in the last 2 years.
3. Knowledge of LCA data and EPDs.
4. Knowledge of regulations surrounding LCA and embodied carbon.

The verifier must include a CV demonstrating their experience and knowledge against the above requirements.

Third party

"A person or body that is recognised as being independent of the parties involved, as concerns the issue in question" (BS EN 15804:2012+A1:2013).

The third-party verifier must be independent of the LCA assessor and demonstrate impartiality (for general principles, see ISO 17029). To qualify as a third party, the verifier must belong to an organisation not involved in the project and must not provide advice to the project, as this could compromise their impartiality during verification.

Additional information

Additional guidance on LCA and whole life carbon

UK:

- RICS Whole life carbon assessment (WLCA) for the built environment, 2nd Edition
- LETI Embodied Carbon Primer
- UK Net Zero Carbon Building Standard
- Overbury (2024) Counting the upfront carbon in Cat B office fit out - Part 1
- Overbury (2024) Counting the upfront carbon in Cat B office fit out - Part 2

France:

- Réglementation environnementale RE2020

USA:

- Embodied Carbon Harmonization and Optimization (ECHO) Project
- AIA-CLF Embodied Carbon Toolkit for Architects
- AGC PLAYBOOK on Decarbonization & Carbon Reporting in the Construction Industry (PDF)

Global:

- WGBC Bringing embodied carbon upfront (PDF)

Examples of relevant LCA training courses

- CIBSE Lifecycle Carbon Assessment (LCA) Foundation Training
- Circular Ecology: Life Cycle Assessment (LCA) Training Course
- MIT Professional Education: Life Cycle Assessment
- One Click LCA: Construction LCA Bootcamp
- RICS: Certificate in Whole Life Carbon Assessment Training Programme

Mat 02 Environmental product declarations

(all buildings)

Aim

To encourage availability of robust and comparable data on the impacts of construction products through the provision of environmental product declarations (EPD).

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

One credit – Product specification

1 Specify construction products with EPDs that achieve a total EPD points score of at least 20, according to M1.

2 Enter the details of each EPD in the BREEAM Platform, including the material category classification. The EPD points score and the number of credits achieved will be calculated automatically.

Methodology

M1: Total EPD points score methodology

In the BREEAM Platform, the total EPD points score shall be calculated as follows:

1. For each EPD, find and select the applicable material classification for the construction product as per Table 68 on the next page. If a construction product comprises more than one material, select the material category classification representing most of the construction product (by volume).
2. For each EPD that is applicable to a specified construction product, select the relevant EPD type as shown in Table 67 on the next page.
3. The BREEAM Platform will add together the EPD points calculated for each material classification to obtain the total EPD points score.

Table 67: EPD points for different types of EPD

Recognised types of EPD	Validity	EPD points
EPD applicable to more than one product in the same product category, and more than one manufacturer.	— EPD unexpired at the point of specification. — Product installed in the building by the end of construction. — EPD issued or registered by an ISO 14025 compliant programme operator. — For products covered by the Construction Product Regulations, the EPD must have been generated using product category rules based on BS EN 15804.	0.5
EPD applicable to more than one product in the same product category, and a single manufacturer.		0.75
EPD applicable to a single product*, and a single manufacturer (the product may be manufactured in more than one location) *Or variations of a single product that only differ in terms of colour or pattern.		1.5

Table 68: Material classification

Ref	Material category	Uniclass 1.4 codes (for information)
1	Timber or timber-based products	P5
2	Concrete or cementitious	P2*
3	Metal	P4
4	Stone or aggregate	P1, P3*
5	Clay-based	P33
6	Gypsum	P232
7	Glass	P314
8	Plastic, polymer, resin, paint, chemicals and bituminous	P7, P34
9	Animal fibre or skin, cellulose fibre	P6
10	Other	P8
*Except subsets listed separately. For example, P2 generally relates to 'Concrete or cementitious' except for the subset P232 which relates to 'Gypsum'.		

Compliance notes

Ref	Terms	Description
CN1	EPD for systems of products always installed together	Where an EPD is for a system of products from the same manufacturer that are always installed together, this system of products shall be considered a single product for the purposes of assessment in BREEAM. Examples of this include: — a flooring system of products comprising of the floor finish and an adhesive.
CN2	EPDs' validity	EPDs which have expired or are pending verification at the time of specification cannot score points. However, it is not necessary that they are valid at the time of the design or post-construction stage submissions. BREEAM is primarily trying to encourage designers to take EPDs into consideration when specifying products.
CN3	EPDs – Products containing multiple materials	Construction products can comprise of either a single material, or multiple materials. Where a product (with an EPD) is comprised of more than one material, the assessor should decide which material category classification should be used for classifying the EPD at their own discretion, and in accordance with the categories listed in Table 68 above. To do this, the assessor should base the EPD classification on the material that represents most of the product's volume in accordance with the categories listed in Table 68 above. For example, if a product comprises 0.8 m^3 of metal and 0.6 m^3 of glass, then the

Ref	Terms	Description
		classification to use for the EPD is "Metal". Other reasonable approaches may be used. Whatever approach is used, it must be applied consistently across all EPD classifications.

Evidence

Criteria	Interim design stage	Final post-construction stage
All	Relevant section of the building specification or schedule confirming materials or products which will have EPDs. Where products are specified at design stage, copies of EPD certificates to be provided.	Updated schedule to confirm products specified with EPDs. Copies of all EPD certificates and robust post-construction evidence to confirm the specified materials have been installed. Robust post-construction evidence to verify proof of purchase for all materials with EPDs such as delivery tickets, invoices, purchase orders, confirmation from suppliers or site photographs.

Definitions

Construction product

A product with a manufacturer reference number that is specified by the designer (e.g. architect, engineer, interior designer, quantity surveyor, landscape architect etc.) or selected by the constructor (principal or sub-contractor), and installed on the project.

For further information on the definition of a 'construction product' in Mat 02, see KBCN1142.

Environmental Product Declaration (EPD)

For BREEAM compliance, an independently verified environmental label (i.e. ISO Type III label) according to the requirements of ISO 14025.

Additional information

None.

Mat 03 Responsible sourcing of construction products

(all buildings)

Aim

To ensure construction products that end up in the completed asset minimise negative environmental, economic, and social impacts across their supply chain.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	4 + 1 exemplary	Pass	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Prerequisite – Legally harvested and traded timber

1 All timber and timber-based products used on the project are Legally harvested and traded timber.

One credit – Enabling sustainable procurement

2 A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must:

2.a Be in place before the end of Concept Design.

2.b Include sustainability aims, objectives, and strategic targets to guide procurement activities. Targets do not need to be achieved for the credit to be awarded at post-construction stage but justification must be provided for targets that are not achieved.

2.c Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible.

2.d Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan.

2.e The documented policy and procedure must be disseminated to all relevant internal and external personnel and included within the construction contract to ensure that they are enforceable on the assessed project.

In addition, if the plan is applied to several sites or adopted at an organisational level it must:

2.f Identify the risks and opportunities of procurement against a broad range of social, environmental, and economic issues following the process set out in ISO 20400:2017.

Up to three credits (plus one exemplary credit) – Measuring responsible sourcing

3 In the BREEAM Platform, use the Mat 03 calculator and follow M1 to determine the number of credits achieved for the construction products. Credits are awarded in proportion to the number of points achieved, as set out in Table 69 below as well as the route of assessment (see M1).

Table 69: BREEAM credits available for percentage of points achieved

Credits achieved	% of available points required, per assessment route	
	Assessment Route 1	Assessment Route 2
1 credit	≥ 13%	≥ 8%
2 credits	≥ 23%	≥ 18%
3 credits	≥ 33%	≥ 28%
3 credits + 1 exemplary credit	≥ 53%	≥ 48%

Each recognised RSCS scheme corresponds to a point score between 1-10 as per Guidance Note 18. The points achieved is equal to the average of these scores.

Methodology

M1: Assessment process for the Mat 03 calculator

In the BREEAM Platform, the Mat 03 calculator can be completed in two ways:

— Route 1: Where at least some material quantities are not available.

— Route 2: Where material quantities are available for all products being assessed, this methodology will proportionally weight the individual product scores to give a more representative assessment.

To assess this issue there are up to two types of data needed for each product:

— Responsible sourcing certification scheme (RSCS) or environmental management system (EMS) certifications. A list of BREEAM-recognised RSCS and EMS schemes and applicable point scores can be found in Guidance Note 18.

— Product or material quantities (Route 2 only).

The following data should also be entered for non-scoring purposes:

— Product location category within the RICS New Rules of Measurement (NRM) classification

— Product name

— Material type

— Product manufacturer

— RSCS certification number

To determine the number of credits that are achieved for responsible sourcing of construction products, the Mat 03 calculator must be completed with all the relevant information. Each construction product must be entered in the calculator individually (unless it is below the relevant cut-off threshold as per M6).

In the BREEAM Platform, the following principles apply to the Mat 03 calculator:

— The quantity of a product has not been worked out (Route 1).

— The quantity of a product has been worked out (Route 2).

— Where construction products or materials are subject to a performance specification and a specific manufacturer and certificate reference cannot be provided, the missing details should be completed as 'tbc'.

The following steps outline the process to be followed to determine the number of credits achieved for responsible sourcing using the Mat 03 calculator:

1. Based on the scope of assessment parts, identify the in-scope construction products according to the Mat 03 location areas as shown in M2 and exclude any construction products that are below the cut-off thresholds (as given in M6).
2. Obtain and identify any relevant BREEAM-recognised responsible sourcing certification scheme (RSCS) or environmental management system (EMS) certifications for each product. If there is more than one material within a product, identify all materials until you cover most of the product (≈80% by volume). A list of BREEAM recognised RSCS and EMS schemes and applicable point scores can be found in Guidance Note 18. The score is zero if a construction product has no certification, is non-compliant with broken chain requirements, or has a certification type that is not listed in Guidance Note 18.
3. Select whether Route 1 or Route 2 will be targeted for the assessment.
4. For each product, enter the data into the Mat 03 calculator. The Mat 03 calculator points will be added based on the RSCS scheme for each product and the quantity of each product.
5. The Mat 03 calculator collates all scores and shows the credits awarded.

Additional guidance on demonstrating compliance with the criteria in Mat 03 can be found in Guidance Note 24.

M2: Scope of assessment

The tables below indicate the RICS New Rules of Measurement (NRM) classifications that must be included in the scope of the fit out assessment parts. All construction products that are installed as part of one or more of these relevant building elements are in-scope and must be included in the BREEAM Mat 03 calculator. In some cases, products associated with a given RICS NRM classification may be associated with multiple fit out assessment parts.

Table 70: In-scope building elements for Local services

In-scope (based on New Rules of Measurement (NRM) classification system)		
5 Services	5.5 Heat source	5.5.1 Heat source
	5.6 Space heating and air-conditioning	5.6.2 Local heating
		5.6.4 Local cooling
		5.6.6 Local heating and cooling
		5.6.8 Local air-conditioning
	5.7 Ventilation	5.7.2 Local ventilation
		5.7.3 Smoke extract or control
	5.9 Fuel installations and systems	5.9.1 Fuel storage
		5.9.2 Fuel distribution systems

Table 71: In-scope building elements for Interior design

In-scope (based on New Rules of Measurement (NRM) classification system)		
2 Superstructure	2.7 Internal walls and partitions	2.7.1 Walls and partitions
	2.8 Internal doors	2.8.1 Internal doors
3 Internal finishes	3.1 Wall finishes	3.1.1 Finishes to walls
	3.2 Floor finishes	3.2.1 Finishes to floors
		3.2.2 Raised access floors
	3.3 Ceiling finishes	3.3.1 Finishes to ceilings
		3.3.2 False ceilings
		3.3.3 Demountable suspended ceilings
4 Fittings, furnishings and equipment	4.1 Fittings, furnishings and equipment	4.1.1 General fittings, furnishings and equipment
		4.1.2 Kitchen equipment
		4.1.3 Specialist fittings, furnishings and equipment

For each New Rules of Measurement (NRM) classification, the respective location category in the Mat 03 calculator is provided in Table 72 below. The calculator will automatically assign the location category based on the NRM classification chosen.

Table 72: BREEAM location categories

New Rules of Measurement (NRM) classification	Equivalent BREEAM location category
2.7 Internal walls and partitions	Internal partition or internal walls (including finishes)
2.8 Internal doors	Door or window
3.1 Wall finishes	Internal partition or internal walls (including finishes)
3.2 Floor finishes	Floor (including floor finishes)
3.3 Ceiling finishes	Ceiling (including ceiling finishes)
4.1 Fittings, furnishings and equipment	Fittings, furnishings and equipment
5.5 Heat source	Building services
5.6 Space heating and air-conditioning	Building services
5.7 Ventilation	Building services
5.9 Fuel installations or systems	Building services

M3: Material categories

For the BREEAM Mat 03 calculator every construction product must be classified according to one of the material categories in Table 73 below. Where unclear, choose the closest matching category.

Table 73: Material categories

Ref	Material category
1	Timber or timber-based products
2	Concrete or cementitious
3	Metal
4	Stone or aggregate
5	Clay-based
6	Gypsum
7	Glass
8	Plastic, polymer, resin, paint, chemicals and bituminous
9	Animal fibre or skin, cellulose fibre
10	Other

M4: Approach to building services

BREEAM recognises that obtaining responsible sourcing information on building services can be more complicated and more difficult than with other construction products.

A simplified approach for construction products used in building services has been set out in Guidance Note 24 (GN24).

M5: Broken chain

There will be situations where a product or material specified by the design team (or chosen by the constructor) is certified at the manufacturing stage, but is supplied by one or more organisations that have no relevant certification. This is known as a broken chain. For example, this applies where a fabricator, without certification, is using material from a certified source or where a certified product or material is supplied to site by a non-certified supplier.

To recognise responsible sourcing certification where it does exist in the supply chain, while reducing the risks associated with a broken chain, it is permissible to use the upstream certification score in the Mat 03 calculator where the downstream risk to responsible sourcing is considered to be low.

Specifically, all organisations without responsible sourcing certification must show that they:

1. Only handle or transport materials, or
2. Only fabricate, assemble, or install materials, and
    a. Have a recognised quality management system that ensures there is no mixing or substitution of certified material with uncertified material.

b. Are operating in jurisdictions that can demonstrate relatively robust and well enforced environmental, social and economic controls such as:

    i. Countries that are EU members.

    ii. States that have declared adherence to the OECD Guidelines for Multinational Enterprises.

For more guidance on broken chains, see Guidance Note 24 (GN24).

M6: Cut-off thresholds

Any construction product with a volume less than the cut-off threshold shown in Table 74 below is excluded from the assessment for Mat 03. The volume considered should be taken as the construction product's overall external dimensions, including any internal voids and air spaces.

Minor fixings (brackets, nails, screws, etc.), adhesives, seals and ironmongery would normally fall below these thresholds. For further guidance, see M7.

Construction products that are below the cut-off volume do not need to be listed in the Mat 03 calculator.

Table 74: Cut-off thresholds for products and materials in Mat 03

Location category	Cut-off volume
Internal partition or internal walls (including finishes)	Any product less than 0.33 m^3 per 1000 m^2 of gross internal area (GIA)
Ceiling (including ceiling finishes)	Any product less than 0.33 m^3 per 1000 m^2 of GIA
All other location categories	Any product less than 1 m^3 per 1000 m^2 of GIA

M7: Quantities precision

The degree of tolerance accepted for estimating quantities is ±20% of the final installed quantity. This allows estimates to be made quickly and without calculations.

The assessor does not need to submit calculations to justify estimates – this applies to both in-scope construction products, and to cut-off volume estimations.

Compliance notes

Ref	Terms	Description
CN1	Limitations on using Route 2	Route 2 for a material can only be used when all the materials in that classification (e.g. all timber, all metal etc): — All have quantity information available AND — All quantity information is measured in consistent units that allow weighting (they are all by volume, or all by weight).
CN2	Scope of the issue	This issue excludes any materials used to help with construction, but do not become part of the finished building. This means the issue excludes materials that make up: — Temporary structures. — Temporary scaffolding, site hoarding, formwork etc.
CN3	Legally harvested and traded timber – USA and Canada	For projects in the USA and Canada, compliance with the prerequisite (legally harvested and traded timber) can be demonstrated using the ASTM D7612-21 standard.

Evidence

Criteria	Interim design stage	Final post-construction stage
Prerequisite – Legally harvested and traded timber		
1	Relevant section of the building specification or contract clauses.	Where certified materials were used, copies of all relevant certificates or chain of custody evidence.

Criteria	Interim design stage	Final post-construction stage
		Robust post-construction evidence to verify proof of purchase such as delivery tickets, invoices, purchase orders, confirmation from suppliers or site photographs.
Enabling sustainable procurement		
2	A copy of the Sustainable Procurement Plan. Evidence to show the plan forms part of the construction contract. Relevant section of the building specification, contract clauses or letter of commitment to confirm how the plan will be disseminated to all relevant internal and external personnel.	Evidence demonstrating the effective implementation of the Sustainable Procurement Plan.
Measuring responsible sourcing		
3	Relevant sections of the building specification, summary or schedule confirming all materials within the project, those to be responsibly sourced and to what level. Where products are specified at design stage, copies of responsible sourcing certificates to be provided.	Updated schedule to confirm materials used within the building. Copies of responsible sourcing certificates. Robust post-construction evidence to verify proof of purchase for all materials responsibly sourced such as delivery tickets, invoices, purchase orders, confirmation from suppliers or site photographs.

Definitions

BREEAM Mat 03 calculator

An online calculator used to determine the number of BREEAM credits achieved for this issue.

BREEAM-recognised responsible sourcing certification schemes (RSCSs)

Third party schemes recognised under BREEAM. For information on how schemes are evaluated and recognised, refer to Guidance Note 18 (GN18).

Construction product certificates are used to confirm compliance to the requirements. Where a valid certificate is not available from the manufacturer, claims may be confirmed via the relevant responsible sourcing scheme provider. Many certification scheme organisations list companies and construction products that have been certified against their standards, including the scope of the certification. Some schemes will provide downloadable copies of the certificate which can be used as evidence of compliance for this issue.

Constituent product

A manufacturer-specific product (i.e., with a manufacturer reference number) that is not specified by the designer or the constructor but is used in the manufacture of another specified product.

Construction product

A manufacturer-specific construction product (i.e., with a manufacturer reference number) that is specified by the designer (e.g., architect, engineer, interior designer, quantity surveyor, landscape architect etc.) or selected by the constructor (principle or sub-contractor) and installed on the project.

Legally harvested and traded timber

For all countries except UK:

Legally harvested timber and wood-derived products are those that originate from a forest where the following criteria are met:

1. The forest owner or manager holds legal use rights to the forest
2. There is compliance by both the forest management organisation and any contractors with local and national legal criteria including those relevant to:
    a. Forest management
    b. Environment
    c. Labour and welfare
    d. Health and safety
    e. Other parties' tenure and use rights
    f. All relevant royalties and taxes are paid
3. There is full compliance with the criteria of CITES.

Legally traded means timber or products derived from Legally harvested timber were:

1. Exported in compliance with exporting country laws governing the export of timber and timber products, including payment of any export taxes, duties or levies.
2. Imported in compliance with importing country laws governing the import of timber and timber products, including payment of any import taxes, duties or levies.
3. Traded in compliance with legislation related to the convention on international trade in endangered species (CITES), where applicable.

UK only:

BREEAM follows the UK government's definition of legal and sustainable timber, as outlined in the Central Point of Timber (CPET) 5th Edition of the UK Government Timber Procurement Policy (TPP). At the time of writing, the policy requires all timber and wood-based products to be covered by at least one of the following (but the webpage below should be checked for changes):

1. Third party, independent forest certification schemes – Category A (e.g. FSC or PEFC).
2. Evidence on a case-by-case basis in line with the Framework for Evaluating Category B evidence – Category B.

For the avoidance of doubt, 100% of the timber and timber-based products must be compliant.

Further information on the UK Government's TPP and compliant responsible sourcing certification schemes is available from: www.gov.uk/guidance/timber-procurement-policy-tpp-prove-legality-and-sustainablity.

New Rules of Measurement (NRM)

A standard set of measurement rules and guidance for the cost management of construction projects and maintenance works. For more information visit: www.rics.org.

Responsible sourcing

The act of applying and managing sustainable development principles in the specification, procurement, and tracing of construction products. In BREEAM, this is demonstrated through auditable third-party certification schemes. For an up-to-date table of BREEAM-recognised RSCSs, refer to Guidance Note 18 (GN18).

Responsible sourcing certification scheme point scores

A graded scale to reflect the rigour of the RSCS. Used for awarding credits in this issue. For an up-to-date table of BREEAM-recognised RSCSs, refer to Guidance Note 18 (GN18).

Route 1

A route that does not measure the quantities of each construction product for the Mat 03 calculator. Compared to Route 2, this results in a potentially lower score. For further details, see M1.

Route 2

A route that measures the quantity of each construction product within a material category in the Mat 03 calculator. The improvement in rigour means a potentially higher score than Route 1. For further details, see M1.

Sustainable procurement plan

A plan that sets out a clear framework for the responsible sourcing of construction products to guide procurement throughout a project, for everyone involved in this process. The plan may be prepared and adopted at an organisational level or be site or project specific.

Additional information

None.

Mat 05 Material efficiency

(all buildings)

Aim

To avoid unnecessary materials use arising from over specification without compromising structural stability, durability or the service life of the building.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

One credit – Material efficiency

1 At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials within the fit out scope. This must be done for each of the following stages (see Table 75 on the next page):

- 1.a Preparation and Brief
- 1.b Concept Design
- 1.c Developed Design
- 1.d Technical Design
- 1.e Construction

2 Develop, record, and implement measures to improve material efficiency, consistent with the targets set earlier (see Table 75 on the next page), during:

- 2.a Developed Design
- 2.b Technical Design
- 2.c Construction

3 At project completion, report the targets, strategies, and actual material efficiencies achieved across all stages.

Methodology

M1: Material efficiencies

Examples of how material efficiency can be considered at each work stage are provided in Table 75 below. The table is based on the principles set out in Parts 1 and 2 of the BS 8895 series of standards.[62], [63] As a minimum, the measures listed in the 'evidence' rows must be met to show compliance with the issue.

Table 75: Material efficiency strategy

Work stages and efficiencies	
Preparation and Brief	
Objective	To set requirements that inform decisions throughout the design and construction of the project.
Participants	Client or client's agent with input from the design team if appointed.
Action	Assess the site, the likely project scale, and the client's functional and aesthetic requirements to set material efficiency objectives for the project.
Evidence	Dedicated report that sets out a clear framework to guide material efficiency activities throughout the design and construction of the project. The report should set out aims, objectives, targets, performance indicators, opportunities, constraints and responsibilities to guide material efficiency activities.
Concept Design	
Objective	Develop strategies to implement or action the materials efficiency requirements set under the Preparation and Brief stage.
Participants	Design team including at least: — Architect — Structural Engineer — Building Services Engineer
Action	Hold workshops with the project team to identify design opportunities to reduce or optimise materials use through design, specification, construction techniques etc.
Evidence	Minutes of the workshops held. Documentation demonstrating how the feedback from the workshop has been incorporated in the concept design of the project, for example: outline specification for materials selection, report on approximate predicted reductions in material quantities.
Developed Design and Technical Design	
Objective	Develop design proposals based on learning from the concept design.
Participants	All relevant members of the design team.
Action	Incorporate material efficiency measures and strategies identified in concept design into architectural, structural and building services design as appropriate. Review performance against previous stages and identify deviations.
Evidence	Report on deviations from previous stages and additional actions to be taken. Documentation demonstrating the incorporation of the outcomes from the concept stage and additional actions, for example: design drawings or specifications demonstrating materials efficiency measures undertaken.
Construction	
Objective	Implement material efficiency measures in construction.
Participants	Principal contractor.
Action	Implement material efficiency measures and strategies identified in previous stages in building construction and identify deviations. Identify further efficiencies as appropriate for this stage.
Evidence	Report on deviations from previous stages. Documented evidence of activity to further identify efficiencies at this stage, for example: meeting minutes, training events, waste reduction documentation etc.

Compliance notes

None.

Evidence

Criteria	Interim design stage	Final post-construction stage
All	For design stage actions (criteria 1.a to 1.d and 2.a to 2.b): The evidence required to demonstrate compliance will vary according to the work stage. Examples of how material efficiency could be considered together with the **minimum** evidence requirements to be provided, at each project stage, are set out in Table 75 on the previous page. For construction stage actions (criteria 1.e and 2.c): Relevant section of the building specification or contract clauses or letter of commitment to report material efficiencies at post-construction.	Examples of how material efficiency could be considered together with the **minimum** evidence requirements to be provided at post-construction are set out in Table 75 on the previous page.

Definitions

Material efficiency

The process of undertaking a building project to enable the most efficient use of materials over the life cycle of the building and its components. This includes using fewer materials, reusing existing demolition and strip-out materials and, where appropriate, procuring materials with higher levels of recycled content. It may also include the adoption of alternative means of design or construction that result in lower materials usage and lower wastage levels including off-site manufacture and use of pre-assembled service pods.

Relevant parties

All parties (as relevant to the project stage) involved in the design, specification or construction of the building should be consulted. This includes, but is not limited to, the following:

1. Client or developer
2. Cost consultant
3. Architect
4. Structural or civil engineers
5. Building services engineers – mechanical, electrical
6. Principal contractor
7. Demolition or strip-out contractor
8. Environmental consultant
9. Project management consultant
10. Materials or component manufacturers or suppliers

Additional information

None.

Resilience



Summary

This category does not apply to fit out assessments.

Assessment issues

Rsl 01 High level climate and natural hazard exposure screening	-
Rsl 02 Climate-responsive natural hazard resilience strategy	-
Rsl 03 Implementing resilience and adaptation measures	-
Rsl 04 Protection against human error and malicious damage	-
Rsl 05 Surface water run-off management	-
Rsl 06 Increasing local resilience through the asset	-

Rsl 01 High level climate and natural hazard exposure screening

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Rsl 02 Climate-responsive natural hazard resilience strategy

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Rsl 03 Implementing resilience and adaptation measures

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Rsl 04 Protection against human error and malicious damage

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Rsl 05 Surface water run-off management

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Rsl 06 Increasing local resilience through the asset

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Waste



Summary

This category encourages the sustainable management (and reuse where feasible) of construction and operational waste and waste through future maintenance and repairs associated with the building structure. By encouraging good design and construction practices, issues in this section aim to reduce the waste arising from the construction and operation of the building, encouraging its diversion from landfill. It includes recognition of measures to reduce future waste as a result of the need to alter the building in the light of future changes to climate.

Assessment issues

Wst 01 Construction waste management	4 credits + 1 exemplary
Wst 02 Recycled aggregates	-
Wst 03 Operational waste	1 credit
Wst 04 Speculative finishes	1 credit
Wst 06 Disassembly and adaptability	2 credits

Wst 01 Construction waste management

(all buildings)

Aim

To promote resource efficiency via the effective and appropriate management of construction waste.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	4 + 1 exemplary	Outstanding	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

One credit – Pre-fit-out resource audit

1 Carry out an assessment of materials and components remaining within the fit-out zone prior to installation works, to identify opportunities for reuse, recycling, or retention. The assessment must:

1.a Identify retained elements and opportunities for reuse.

1.b Inform the resource management plan.

1.c Set reuse and waste targets for the fit-out works.

Up to two credits – Construction resource efficiency

One credit

2 Prepare a compliant resource management plan (see M2) covering:

2.a Non-hazardous waste materials generated during the strip-out and fit-out works (excluding demolition and excavation unless within scope).

2.b Accurate data records on waste arisings and waste management routes.

3 Set appropriate fit-out targets (see M3) for non-hazardous and hazardous waste produced on site in m^3 of waste per 100 m^2 or tonnes of waste per 100 m^2.

4 Using the collated data, report the amount of waste generated per 100 m^2 (gross internal floor area) in m^3 (where volume is actual volume of waste, not bulk volume) or tonnes from the construction process via the BREEAM Platform.

One credit

5 Achieve criteria 1 to 4 (where applicable).

6 Procedures are in place for sorting, reusing and recycling construction waste into at least five defined waste groups (see Table 77 on page 259) either on site or off-site through a licensed external contractor.

One credit – Diversion from landfill

7 A significant quantity of non-hazardous fit-out and strip-out waste (where applicable) generated by the project has been diverted from landfill according to the figures within Table 76 below.

8 Waste materials will be sorted into separate key waste groups (according to the waste streams generated by the scope of the works) either on site or off-site through a licensed contractor for recovery (see Table 77 on page 259 for information on waste groups).

Table 76: BREEAM targets for diversion from landfill

BREEAM credits	Source of waste	Amount of waste diverted from landfill	
		Volume	Weight (Tonnage)
One credit	Fit-out / strip-out works	75%	80%
Exemplary level	Fit-out / strip-out works	95%	97%

One exemplary credit – Diversion from landfill

9 Achieve criteria 1 to 8 (where applicable).

10 The percentage of non-hazardous fit-out and strip-out waste (if relevant) diverted from landfill meets or exceeds the exemplary level benchmark (in Table 76 above).

Methodology

M1: Pre-fit-out resource audit scope

The pre-fit-out resource audit must be carried out before strip-out or fit-out installation works begin and must cover:

- Identification and quantification of key materials and components remaining within the fit-out zone.
- Potential applications and any related constraints for the retention, reuse, refurbishment, or recycling of these materials and components in accordance with the waste hierarchy.
- Opportunities for reuse, retention, or refurbishment within the same fit-out project or building, including:
  - Elements to be retained in situ.
  - Elements to be relocated or re-purposed within the fit-out.
  - Elements suitable for reuse elsewhere within the building or wider estate.
- Identification of local re-processors, recyclers, or take-back schemes for materials and components that cannot be retained or reused but are suitable for high-grade recycling or manufacturer recovery.
- Identification of reuse targets, where appropriate, expressed as a proportion (e.g. percentage of ceiling grid retained, percentage of floor area reusing existing raised floor, percentage of joinery refurbished).
- Identification of recycling and landfill-diversion targets for the remaining materials and components, aligned with the project's resource management plan (RMP).

M2: Resource management plan

A resource management plan (RMP) aims to promote resource efficiency and to prevent illegal waste activities. Resource efficiency includes minimising waste at source and ensuring that clients, designers and principal contractors assess the use, reuse and recycling of materials and products on site and off site. A compliant RMP defines:

1. A target benchmark for resource efficiency, expressed as m^3 or tonnes of waste per 100 m^2 (gross internal floor area), proportionate to fit-out activities.

   Example benchmark range: 2–5 m^3 or 1–3 tonnes per 100 m^2 GIA.

2. Procedures and commitments to minimise non-hazardous waste generation and to achieve or improve upon the target benchmark.
3. Procedures to minimise hazardous waste, such as paints, adhesives, sealants, and cleaning chemicals, and to ensure safe handling and disposal in accordance with current regulations.
4. Waste minimisation targets and details of actions to reduce waste at source, including design-stage material optimisation, procurement of take-back schemes, or use of prefabricated and modular elements.
5. Procedures to estimate, monitor, measure, and report on non-hazardous and hazardous waste arising from fit-out and strip-out works, including those generated by subcontractors and off-site fabrication facilities where applicable. Data obtained from licensed waste contractors must be reliable, verifiable, and supported by waste transfer documentation.
6. Regular reporting of waste data, at least monthly or aligned with project progress milestones, to validate completeness and consistency of records against expected volumes and invoices.
7. Procedures for sorting, reusing, and recycling waste into defined waste groups, either on site or via a licensed external contractor, ensuring high-grade recovery and material traceability.
8. Procedures to review and update the RMP throughout the project to reflect changes in scope, material specifications, or waste management arrangements.
9. The name or job title of the individual (e.g., site manager, sustainability coordinator, or principal contractor representative) responsible for implementing, monitoring, and updating the plan.

M3: Appropriate targets

Appropriate targets for waste generation and resource efficiency should reflect the scale and nature of the fit-out works, available reuse opportunities, and organisational best practice.

Targets must be:

1. Evidence-based, drawing on data from previous fit-out projects of a similar type, published benchmarks, or company-wide resource efficiency targets.
2. Ambitious yet realistic, encouraging continual improvement rather than simply meeting easily attainable goals.
3. Inclusive of all relevant waste streams, such as packaging materials, off-cuts, finishes, fixtures, fittings, and building services components arising from strip-out or fit-out activities.

The design or project team must justify why the selected targets are appropriate for the specific project, referencing:

— The scope and intensity of the work.

— Expected material turnover.

— Any circular procurement, take-back, or reuse strategies incorporated.

Targets and reporting should exclude demolition or excavation waste, unless these activities fall explicitly within the fit-out project scope.

Compliance notes

Ref	Terms	Description
CN1	Limited site space for segregation and storage	Where space on site is limited or shared (e.g., within multi-tenanted or urban buildings), waste materials may be collected as mixed waste and separated off-site by a licensed waste contractor. Alternatively, manufacturers' take-back or reverse-logistics schemes may be used. Documentary evidence must confirm that segregation and recovery of materials is carried out to the required levels and that materials are reused

Ref	Terms	Description
		or recycled appropriately.
CN2	Excavation waste	Excavation and demolition waste are outside the scope of the Fit Out scheme and must not be included in waste generation or diversion calculations.
CN3	Contractor not yet appointed at the design stage	Where the contractor has not been engaged at design stage certification, it is acceptable to award the credits based on a commitment. This commitment must be from a suitable member of the design team and must detail the targets and criteria which must be met. Evidence must also confirm that the details in the commitment will form part of the contractual requirements. Note: This does not apply to the requirement for a pre-demolition/pre-refurbishment audit, which must be undertaken at Concept Design stage.
CN4	Small scale fit-outs	For small or short-duration projects where waste arisings are minimal, the project team must still prepare a proportionate resource management plan identifying key waste types, estimated volumes, and recovery routes.

Evidence

Criteria	Interim design stage	Final post-construction stage
Pre-fit-out resource audit		
1	Copy of compliant pre-fit-out resource audit.	Updated pre-fit-out resource audit, including actual waste results.
Construction resource efficiency		
2–5	Copy of compliant resource management plan (RMP) including appropriate targets for construction waste produced. Where contractor is not yet appointed, credits may be awarded based on a contract requirement or letter of commitment from the client or developer.	Records of actual waste arisings from site.
6	Confirmation of procedures in place for sorting, reusing and recycling construction waste.	Records to show that construction waste was sorted into at least 5 waste streams.
Diversion from landfill		
7–10	Relevant section or clauses of the building specification or contract. OR A letter of commitment from the client or developer. OR Copy of RMP which includes relevant commitments/targets and procedures to divert waste from landfill.	Records of actual waste arisings from site, amount diverted from landfill and how this has been processed i.e. recycled, reused, etc. Evidence of waste transfer station recycling rates, where applicable. Confirmation of how waste was sorted into the key waste groups.

Definitions

Competent person – Pre-refurbishment audit

An individual with appropriate knowledge and experience of fit-out and strip-out activities, waste management, and options for reuse and recycling of relevant waste streams (e.g. packaging, finishes, furniture, fixtures, and services components). This could be the principal contractor, site manager, or sustainability/waste coordinator responsible for preparing and implementing the resource management plan (RMP).

Dedicated off-site manufacturing or fabrication

Production of a component or material carried out in an off-site manufacturing or processing facility specifically set up for the development project.

Diversion from landfill

Diversion from landfill includes:

1. Reusing the material on site (in situ or for new applications).
2. Reusing the material on other sites.
3. Salvaging or reclaiming the material for reuse.
4. Returning material to the supplier via a 'take-back' scheme.
5. Recovery of the material from the site by an approved waste management contractor and subsequently being recycled or sent for energy recovery.

Resource management plan (RMP)

A resource management plan (RMP) aims to promote resource efficiency and to prevent illegal waste activities. Resource efficiency includes minimising waste at source and ensuring that clients, designers and principal contractors assess the use, reuse and recycling of materials and products on site and off site. Details of compliant resource management plans for BREEAM are given in M2.

Additional information

Best practice construction waste management plan

Best practice is a combination of commitments to:

1. Design out waste (materials optimisation).
2. Reduce waste generated on site.
3. Develop and implement procedures to sort and reuse and recycle construction and demolition waste on site and off site (as applicable).
4. Follow guidance from relevant national waste framework directives.

Construction waste groups

Projects must identify and record the main waste groups generated during the fit-out and strip-out works, selecting those most relevant from Table 77 below. The intent is to encourage segregation of waste at the highest practicable level, maximise opportunities for reuse and recycling, and minimise the proportion of mixed or residual waste sent to landfill. At least five key waste groups should be tracked and reported, unless the project team can justify that fewer are generated due to the limited scope or size of the works.

Table 77: Key waste group examples

European Waste Catalogue	Key group	Examples
170604	Insulation	Glass fibre, mineral wool, foamed plastic
1501	Packaging	Paint pots, pallets, cardboard, cable drums, wrapping bands, polythene sheets
170201	Timber	Softwood, hardwood, board products such as plywood, chipboard, medium density fibreboard (MDF)
1602	Electrical and electronic equipment	Electrical and electronic TVs, fridges, air-conditioning units, lamps equipment
170103	Tiles and ceramics	Tiles, bricks, ceramic, sanitary ware
1704	Metals	Radiators, cables, wires, bars, sheet
170802	Gypsum	Plasterboard, render, plaster, cement, fibre cement sheets, mortar
170101	Binders	Render, cement, mortar

European Waste Catalogue	Key group	Examples
170203	Plastics	Pipes, cladding, frames, non-packaging sheet
Most relevant EWC	Liquids	Non-hazardous paints, thinners, timber treatments
Most relevant EWC	Hazardous	As defined in national legislation or as defined in the Hazardous Waste List (HWL) of the European Waste Catalogue (EWC). Compliance is required with the more onerous of the two.
Most relevant EWC	Floor coverings (soft)	Carpets, vinyl flooring
Most relevant EWC	Architectural features	Roof tiles, reclaimed bricks, fireplaces
170904 (mixed)	Mixed or other	Efforts should be made to categorise waste into the above categories wherever possible.

SmartWaste

SmartWaste is an online environmental reporting tool for the construction industry. It enables organisations to efficiently capture, monitor and report on:

- Waste (including site waste management plans and pre-demolition audits)
- Energy (including conversion to carbon dioxide emissions)
- Water
- Responsible sourced materials (including timber)
- Transport
- Considerate Constructors Scheme

Used to meet the criteria of this issue and as a source of evidence for demonstrating compliance, SmartWaste helps organisations to reduce their environmental impacts, making substantial time and cost savings.

More information about SmartWaste can be found at: www.smartwaste.co.uk.

Wst 02 Recycled aggregates

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Wst 03 Operational waste

(all buildings)

Aim

To encourage the recycling of operational waste through the provision of dedicated storage facilities and space.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All

Assessment type specific notes

Ref	Assessment type specific note
1.0	**End-occupier not known** If the end-occupier is not known, but the functions or areas of the assessed building suggest that large amounts of packaging or compostable waste is likely to be generated during the building's operation, e.g. it is a retail or industrial project or contains a large catering facility, then an appropriately sized space and services or infrastructure to accommodate the relevant facilities must be provided. The facilities themselves do not necessarily need to be provided or installed to demonstrate compliance.

Building type specific notes

Ref	Building type specific note
2.0	**Small industrial units** For an industrial building or development or site consisting of a number of smaller units, each ≤ 200 m² floor area, shared facilities that meet the criteria for the building or site as a whole are sufficient to achieve the credit.
2.1	**Shopping centres, retail parks and wider site or campus developments** For shopping centres and retail parks there must be adequate space to cater for each tenant and their potential recyclable waste volumes. Tenants that occupy a large proportion of the centre, i.e. 'flagship or anchor tenants', must have their own dedicated compliant facilities. For smaller non-flagship tenant units, compliant central or common facilities on site or dedicated spaces for individual units will meet the assessment criteria for this BREEAM issue.
2.2	**Residential institution (long-term stay) – Home composting information leaflet** The leaflet must provide information on: — How composting works and why it is important; — The materials that can be composted (e.g. raw vegetable peelings and fruit, shredded paper, tea bags, etc.); and — Details of the operation and management plan for the communal composting scheme. Where a green or kitchen waste collection scheme is in operation, the information leaflet provided by the local authority is sufficient to meet the information leaflet criteria.
2.3	**Residential institution (long-term stay) – Supported living facility** Where it is not possible to locate the recycling bins within a communal area, which is accessible to residents, for safety reasons (e.g. where the residents have mental health problems and free access to these facilities would pose significant risk of self-harm or harm to others) it is acceptable to locate them within a dedicated non-obtrusive position accessible to staff only, but in close proximity to the areas where recyclable waste material is generated.
2.4	**Residential institutions (short-term stay)**

Ref	Building type specific note
	The additional criteria for Residential institutions are not applicable to Residential institutions (short-term stay).
2.5	**Healthcare buildings and country-specific guidance (UK only)** In addition to the standard criteria, the waste facilities are compliant with the relevant NHS guidelines for that part of the UK. **England** Use HTM 07-01 (England version) where the criterion refers to the use of relevant NHS guidelines for the country. **Northern Ireland** Use HTM 07-01 (Northern Ireland version) where the criterion refers to the use of relevant NHS guidelines for the country. **Scotland** Use SHTN3 NHS Scotland Waste Management guidance Part A-Best Practice Overview and Part B Waste Management Policy template where the criterion refers to the use of relevant NHS guidelines for the country. **Wales** Use WHTM07-01 Safe management of healthcare (Wales) where the criterion refers to the use of relevant NHS guidelines for the country.

Assessment criteria

One credit – Operational waste

1 Evidence confirms that dedicated facilities or arrangements for the segregation and storage of recyclable operational waste are available to the assessed unit and are suitable for the expected waste streams and volumes (see M1, M2, and M3). This may include either:

1.a Use of existing centralised waste facilities provided by the landlord or building management; or provision of internal or tenant-specific facilities within the fit-out scope (e.g. waste cupboards, recycling stations, or storage rooms).

1.b The facilities must:

1.b.i Be clearly labelled and signposted to assist with correct segregation and storage of recyclable waste.

1.b.ii Be accessible to occupants or facilities staff for waste deposit and to waste contractors for collection.

1.b.iii Have sufficient capacity for the typical waste volumes generated by the activities and occupancy of the fit-out space or otherwise be supported by access to a shared building waste area of adequate capacity.

2 Where the consistent generation of specific waste streams is expected from the use of the space (e.g. packaging, catering, or organic waste), the following must be demonstrated:

2.a Appropriate containment or equipment is available for these waste streams, either within the tenant space or through access to building-level facilities.

2.b Where organic waste is stored or processed on site, provisions for hygiene and cleaning (e.g. nearby tap or wash-down area) are available.

2.c Where applicable, waste management procedures and signage are included within the tenant operational handbook or facilities management plan.

Additionally for Residential institutions (long-term stay) with self-contained dwellings only

3 Each dwelling has a provision of three internal storage containers, as follows:

3.a A minimum total capacity of 30 litres.

3.b No individual container smaller than 7 litres.

3.c All containers in a dedicated non-obstructive position.

3.d The storage containers for recycling are provided in addition to non-recyclable waste storage.

4 Home composting facilities and a home composting information leaflet are provided within the kitchen area or communal space for each self-contained dwelling or bedsit.

Additionally for Residential institutions (long-term stay) with individual bedrooms and communal facilities only

5 The above storage requirements (criterion 3 on the previous page) for self-contained dwellings or bedsits are met for every six bedrooms.

6 The recyclable storage is located in a dedicated non-obstructive position in either:

6.a Communal kitchens OR

6.b Where there are no communal kitchens present, in a communal space such as communal lounges or utility areas.

7 Home composting facilities and a home composting information leaflet are provided within the kitchen area or communal space for each individual bedroom, bedsit, or communal kitchen.

Additionally for healthcare buildings only (UK only)

8 The specified or installed operational waste facilities are compliant with the relevant NHS guidelines for that part of the UK.

Methodology

M1: Determining if the dedicated space complies

The design or fit-out team must demonstrate that adequate facilities for the segregation and storage of recyclable operational waste are available for use by the assessed unit. The level of control and responsibility of the tenant must be clearly identified.

The adequacy of provision should be determined based on:

1. The type and intensity of activities expected within the fit-out area (e.g. office, retail, food service, or mixed use).
2. The waste streams likely to be generated by occupants (e.g. paper, packaging, food, glass, electronic waste).
3. The arrangements in place for transfer to the main building waste area and subsequent collection.

Where the fit-out project relies on existing landlord or shared facilities, the design team must confirm that:

1. The space is accessible to the tenant.
2. It allows for segregation of key recyclable streams.
3. Collection is carried out by a licensed waste contractor or managed under an existing building-wide waste-management contract.

Where provision within the tenant's own demise is required (e.g. for initial segregation or short-term storage), internal waste points or cupboards may be provided. The size and number of these areas should be proportionate to the expected daily or weekly waste volumes.

Indicative guidance is as follows:

Fit-out area	Recommended internal waste storage allowance
< 1000 m²	Minimum 1 m² of dedicated waste storage or recycling cupboard space
≥ 1000 m²	1–2 m² per 1000 m² of fit-out area, or access to shared facilities of equivalent capacity

Where commercial-scale food preparation or catering is provided, additional space for segregated organic waste should be confirmed within either the tenant or shared facilities.

These figures are indicative and intended to support design planning only. The credit does not require construction of new waste areas where provision is outside tenant control.

M2: Separation of recyclable and general waste

Facilities for recyclable waste must be provided in addition to any space used for general or residual waste.

Where shared or landlord facilities are used, evidence must confirm that recyclable streams (e.g. paper/card, plastics, metals, glass, food waste) are segregated either on site or at a licensed off-site facility.

Internal segregation points such as recycling bins in kitchens, print areas, or service zones can be included as part of the compliant provision where they contribute to the effective transfer of recyclable materials to central collection points.

Compactors, balers, or composting equipment are only required where within the fit-out project's control or provided at the building level. The area for storage of recyclable materials must be provided in addition to areas and facilities provided for dealing with general waste and other waste management facilities, e.g. compactors, balers and composters.

M3: Internal storage areas

Where internal or tenant-specific storage areas are provided, the design must ensure that:

1. Waste containers can be safely transported to the main collection area or external collection point without obstruction.
2. Access routes are of suitable width and gradient.
3. Adequate hygiene and cleaning facilities (e.g. nearby tap or drain) are available where organic or food waste is stored.

For shared or landlord-managed facilities, the fit-out team must confirm that collection logistics and vehicle access are appropriate and agreed as part of the building's waste-management plan. Vehicular access dimensions are only applicable where the tenant directly manages the collection process.

Compliance notes

Ref	Terms	Description
CN1	Existing building or landlord facilities	Where the fit-out is located within an existing building that already provides centralised waste-storage facilities, these can be used to demonstrate compliance. The facilities must be accessible to the assessed unit and have adequate capacity for the expected recyclable waste arising from the tenant's operations.
CN2	Multi-unit or multi-tenant buildings	Where several tenants share waste facilities, the project team can demonstrate compliance through the use of shared or landlord-managed storage spaces that collectively accommodate the waste generated by all units. Evidence must confirm that the assessed unit has defined access and responsibility for segregation and transfer of recyclable waste.
CN3	Limited internal space or collection access	Where space within the fit-out is too limited for large waste stores or where direct vehicle access is not possible, smaller internal segregation points (e.g. kitchen bins or recycling cupboards) and/or shared collection areas may be used. The fit-out team must confirm that these are linked to the building's main waste-management system.
CN4	Automated or vacuum waste-collection systems	Automated, pneumatic, or vacuum waste-collection systems are acceptable routes to compliance provided that a waste-management plan is in place (by the landlord, local authority, or management company) confirming that recyclable streams are segregated and collected separately.
CN5	Labelling and signage where bins are not tenant-supplied	Where bins are supplied by the landlord or local authority rather than the tenant, compliance can be demonstrated by providing: (1) permanent signage to the waste area; and (2) labelling of bin spaces according to intended waste streams. Where waste streams are not yet known, a written commitment from the landlord or facilities management provider to install appropriate labels once bins are in use is acceptable.
CN6	Signage for recycling areas	Clear signage must be provided to help occupants and collection agencies identify the recycling area and the waste streams segregated. This may be integrated with the building's existing signage scheme.
CN7	Residential and long-term accommodation	For residential or long-term stay fit-outs (e.g. serviced apartments, student housing, care homes), internal recyclable-waste containers must be provided within each self-contained unit or shared kitchen, as per the residential criteria. Use of existing building food-waste or recycling systems is acceptable where access and occupant guidance are clearly demonstrated.
CN8	Tenant scope of control	The tenant is not required to create new waste-storage rooms or modify landlord-owned infrastructure. Compliance is based on the use, adaptation, or management of facilities within the tenant's control and documented coordination with the landlord or FM provider.

Ref	Terms	Description
CN9	Minimum standard applicability	This issue is not a minimum standard under the Fit Out scheme. Projects will not be penalised where operational-waste storage provision is outside the tenant's influence, provided that appropriate internal segregation facilities and waste-management arrangements are demonstrated.

Evidence

Criteria	Interim design stage	Final post-construction stage
Operational waste		
1	Design drawings, fit-out layouts, or specifications identifying the proposed location and type of operational waste facilities (e.g. internal segregation points, recycling cupboards, or access to shared landlord areas). Confirmation from the design team, tenant, or facilities management provider describing the waste streams expected and how waste will be segregated and transferred to the main collection area. Where the end-occupier is not known, a statement or calculation demonstrating that the design allows for reasonable capacity and access to shared facilities once occupied.	Final fit-out drawings or floor plans showing installed segregation points, internal waste storage cupboards, or access routes to shared waste areas. Photographic evidence from assessor site inspection confirming the presence and labelling/signage of waste-segregation facilities. Where shared landlord facilities are used, written confirmation from the landlord or facilities manager provider verifying access, capacity, and waste-management arrangements.
2	Design drawings or specification confirming provision for organic-waste storage, compactors, or balers within tenant or shared facilities, where such waste streams are expected. If within landlord control, a statement of coordination with the building's waste-management plan.	As-built evidence (drawings, photographs, or landlord confirmation) verifying that any relevant specialised facilities are installed or available for use. Where the tenant relies on landlord provision, evidence of access and agreed management responsibility is sufficient.
Additionally for Residential institutions (long-term stay)		
3–7	Design drawings or relevant section of the building specification or contract clauses to confirm the provision of compliant internal recyclable waste storage and home composting facilities. Commitment to provide home composting information leaflets.	Final construction drawings or equivalent to confirm the location of the storage to each home or kitchen type. Assessor site inspection report with photographic evidence or proof of purchase such as purchase orders to confirm that the compliant internal recyclable waste storage is provided. Manufacturer's product data to confirm the size of the containers provided. Copy of home composting information leaflet and confirmation to show these have been issued as required.

Definitions

Accessible space

An accessible space is one that can be conveniently reached by building occupants for waste deposit and by waste contractors for collection. For fit-out projects within existing buildings, accessibility should be assessed based on the tenant's ability to use the facilities provided, rather than a fixed distance. Access through shared areas or service corridors is acceptable where this forms part of the building's agreed waste-management arrangements.

The 20 m guideline used in new-build assessments may not be achievable or relevant in multi-tenant or vertical developments; assessors should apply judgment on what constitutes accessible in context.

Automated waste collection system

A system that allows for waste separation at the source, for different types of waste and from multiple locations, with enhanced hygienic, occupational health and safety standards. It also reduces the use of waste transport by lorries, reducing nuisance and CO_2 emissions, from fossil fuel consumption. Some companies now offer a fully automated underground system to collect, sort, and transport waste.

Dedicated non-obstructive position

An easily accessible cupboard under the sink or any other cupboard in the kitchen, next to the storage or likely area for storing non-recyclable waste, where practical. Where a kitchen cupboard location is not possible the bins can be located near to the kitchen, in a utility room or connected garage, for example.

Flagship or anchor tenant

A flagship or anchor tenant is the largest and most prominent tenant in a commercial property, such as a shopping centre, whose main purpose is to draw customers to the location. Examples include major department stores or grocery stores, and their presence makes the property more attractive to other, smaller businesses.

Home composting facilities

Home composting facilities are individual composting containers placed within the kitchen area or communal space for each self-contained dwelling, bedsit or communal kitchen. These containers are either emptied into local on-site communal facilities or are collected by composting collection services run by the waste collection authority.

Individual composting containers should be:

1. Located in a dedicated, non-obstructive position.
2. Easily accessible to all users.
3. Durable, low maintenance and cleanable.
4. Enclosed to manage odour and pest issues.

Waste compactor or baler

A machine that is designed to compress waste streams in order to improve storage and transport efficiency.

Additional information

Recyclable storage space

The following footprint dimensions can act as a guide when determining size and accessibility criteria for the recyclable storage space:

1. Compactor dimensions: about the size of one car parking bay, 4.8 m × 2.4 m
2. Skip: the footprint of an 8 and 12 cubic yard skip measures 3.4 m × 1.8 m; therefore allow a minimum of 2.0 m width and 4.0 m length or 8 m² area for the storage and access of such containers
3. Wheeled bins:
    - 360 litre = 0.86 m × 0.62 m
    - 660 litre = 1.2 m × 0.7 m
    - 1100 litre = 1.28 m × 0.98 m
4. Roll-on/roll-off containers: allow a minimum of 6.1 m × 2.4 m

5. Vehicle access: the following are dimensions for lorry types that are typically used to collect waste. Therefore, gate heights and widths should not be smaller than these measurements:
    a. Dustcart (medium capacity): length = 7.4 m, height = 4 m, width 3.1 m
    b. Skip lorry: length = 7 m, height = 3.35 m, width 3.1 m

Consideration must also be given to any other types of vehicle requiring access to this area, e.g. lorries for roll-on/roll-off containers.

Wst 04 Speculative finishes

(offices only)

Aim

To encourage the specification and fitting of finishes selected by the building occupant and therefore avoid unnecessary waste of materials.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

One credit – Speculative finishes

1 For tenanted office areas (where the future occupant is not known), prior to full fit-out works, carpets, other floor finishes and ceiling finishes have been installed in a show area only.

2 Only install floor and ceiling finishes selected by the known occupant of a development. Alternatively, where the occupant is not known and only ceiling finishes and no carpets are installed, the building owner confirms that the first tenants will not be permitted to make substantial alterations to the ceiling finishes.

Methodology

None.

Compliance notes

Ref	Terms	Description
CN1	Designed-out or integrated finishes	The requirements for this credit are met when either: — No finishes within the scope of the issue have been specified, or — Finishes are integrated into the asset and designed in a way that the finish cannot be removed. For instance, a self-finished timber floor or exposed soffit which cannot be removed and does not require additional finishes when installed.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Design drawings, finishes schedules relevant sections of the building specifications or contract clauses or letter from the client or developer to confirm that either no finishes will be installed, or these will be limited to a show area only.	Final construction drawings or equivalent and assessor site inspection report with photographic evidence to confirm that either no finishes will be installed, or these will be limited to a show area only.
2	Design drawings, finishes schedules or relevant sections of the building specifications confirming specified finishes and evidence to demonstrate these have been selected by the occupant. OR Letter of commitment from the client or project team to confirm that floor and ceiling finishes will be selected by the known occupant. Where occupant is not known and ceilings are installed, contract clauses or letter from the client or developer to confirm that the tenant will not be able to make substantial alterations to the ceiling.	Final construction drawings or equivalent or finishes schedules confirming the floor and ceiling finishes and that these have been selected by the occupant. Assessor site inspection report with photographic evidence to verify that the ceiling and floor finishes have been installed in line with the occupant's selection. Where occupant is not known and ceilings are installed, tenancy agreement confirming that the tenant is not allowed to make substantial alterations to the ceiling.

Definitions

Show area – Office buildings

A show area can be either a floor plate or an individual office but must be less than 25% of the net lettable floor area to award the credit.

Speculative finishes

A standard, move in ready level of interior fit-out that a developer applies before a tenant is secured to make the space immediately leasable while remaining generic enough to suit a wide range of future occupants and adaptable at a later date.

Speculative project

A building designed and built by a developer without a pre-existing tenant or buyer in mind. The primary purpose is to anticipate and meet future market demand, with a flexible design, focus on value and common features that would appeal to a broad range of buyers or tenants.

Substantial alterations

Substantial alterations refer to any changes to the ceiling finishes that significantly impact their original appearance, structural integrity, or functional characteristics. This includes, but is not limited to, the removal, replacement, or significant modification of the materials or design.

Routine maintenance, minor touch-ups, and aesthetic adjustments that do not alter the primary function or structural properties of the ceiling finish are not considered substantial.

Additional information

None.

Wst 06 Disassembly and adaptability

(all buildings)

Aim

To minimise future material waste and cost by designing interior systems that can be disassembled, reused, relocated, and reconfigured, thereby supporting circular-economy principles over the life of the tenancy.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	2	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

One credit – Design for disassembly and adaptability – Recommendations

1 By the end of Concept Design, the design team conducts a fit-out interiors study (see M1) to explore the disassembly, reuse, relocation, and reconfiguration potential of interior systems within tenant scope, for example:

- 1.a Demountable partitions.
- 1.b Ceiling systems and raised access floors.
- 1.c Modular furniture, joinery, and storage systems.

2 By the end of Concept Design, develop solutions based on the study (criterion 1) that enable disassembly and adaptability (see M1). For example:

- 2.a Modular/grid-based layouts; standardised interfaces; mechanical fixings in preference to adhesives.
- 2.b Accessible routes and inspection points for services; provision for manufacturer take-back/refurbishment schemes.
- 2.c Identification of elements intended for retention/reuse on future reconfigurations.

One credit – Design for disassembly and adaptability – Implementation

3 Achieve criteria 1 and 2.

4 During Technical Design, provide an update on the following (see M2):

- 4.a How the solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions must be clearly justified.
- 4.b Changes to the recommendations and solutions during the development of the Technical Design.

5 Produce a building design for disassembly and adaptability manual (see Definitions and M2) to hand over to the tenant/owner, setting out: targeted elements, disassembly sequences, fixing types, tools, access points, storage/reuse guidance, and end-of-life/take-back routes.

Methodology

M1: Design for disassembly and adaptability study

The design team must undertake a study during Concept Design that evaluates how the fit-out's interior systems can be disassembled, reused, relocated, or reconfigured with minimal waste during future refurbishments or layout changes. The study should cover all relevant systems within the tenant's control (e.g. partitions, ceilings, raised floors, built-in joinery, lighting, and finishes).

M1.1: Adaptability principles

The study and solutions must consider the following as a minimum:

1. **Versatility**: the ability of interior layouts to accommodate changes in activity or occupancy with minimal material replacement (e.g. open-plan areas that can be subdivided with modular partitions).
2. **Convertibility**: the potential of internal spaces to support more significant functional changes without replacement of key systems (e.g. reconfiguring office meeting rooms to collaboration spaces by adjusting demountable walls or lighting layouts).
3. **Scalability**: the capacity for interior systems to be expanded or reduced in extent, or reused in other areas, through modular components or standardised interfaces (e.g. ceiling grids that can extend with the tenancy).
4. **Serviceability**: access for inspection, maintenance, and upgrade of services and components without major disruption to finishes or adjacent systems.
5. **Interoperability**: the use of standard dimensions, fixings, and connections that enable products from multiple manufacturers to be substituted or reused interchangeably.

For additional guidance, see Table 78 on page 274 and ISO 20887.

M1.2: Disassembly principles

The study and solutions must consider the following as a minimum:

1. **Ease of access**: components and connections (especially those with shorter lifespans) should be accessible for removal or replacement with minimal disturbance.
2. **Independence**: parts and modules should be removable or upgradable without compromising the performance of adjacent systems.
3. **Low-impact finishes**: avoid surface treatments or adhesives that hinder reuse, recyclability, or safe removal.
4. **Circular-economy compatibility**: preference should be given to systems supported by take-back, refurbishment, or remanufacture schemes.
5. **Simplicity**: use straightforward, well-understood assembly methods with minimal customisation or bespoke tooling.
6. **Standardisation**: adopt common grid sizes, fixing types, and product formats to aid interchangeability and reduce waste from future change.
7. **Safety and information**: provide clear data on materials, fixings, and any hazards to support safe disassembly and handling in future works.

For additional information, see Table 79 on page 275 and ISO 20887.

M2: Implementing design for disassembly and adaptability

The implementation will be specific to the building and scope of the project, but information should be made available to the assessor covering the implementation of all adaptability and disassembly principles as per M1.

A disassembly and adaptability manual shall be prepared and submitted, including the following information:

1. Design details: Sufficient information shall be generated documenting specific disassembly methods, material composition, recovery methods, and adaptable design features.
2. Material constituents and manufacturers: Products and materials should be traceable to a specific manufacturer or supplier, with contact details, such as product manufacturer websites, included in the construction documentation.
3. Connection detailing: Connection detailing, especially for reversible connections, should be well documented for the aspect of assembly and disassembly.

For additional information, see ISO 20887.

Compliance notes

Ref	Terms	Description
CN1	Design for disassembly and adaptability – timing	Late consideration of design for disassembly and adaptability, might reduce the study to a 'paper exercise', with minimal value to the project. However, where the assessor is satisfied that there is clear justification for the study being developed at a slightly later stage AND there is clear evidence that the strategy has achieved the intended outcomes despite the later consideration, this will be sufficient for compliance. In any case, all other requirements of the issue must be met for the credit to be awarded.

Evidence

Criteria	Interim design stage	Final post-construction stage
1–2	A copy of the disassembly and adaptability study completed at Concept Design.	No further actions required post-construction. No additional evidence is required other than that listed for the design stage.
4	A copy of the design for disassembly and adaptability implementation plan report completed at Technical Design.	Final construction drawings or equivalent and assessor site inspection report with photographic evidence showing that the recommendations and solutions were implemented within the build.
5	Relevant section of the building specification, contract clauses or letter of commitment to produce a building design for disassembly and adaptability manual.	A copy of the building design for disassembly and adaptability manual.

BRE has avoided being overly prescriptive for this issue, recognising that this is a complex environmental and design issue where solutions and approaches are largely influenced by building specific factors. The evidence required to demonstrate compliance will vary according to the relevant stage. Some examples are:

- Concept Design: reports outlining the activity relating to functional adaptability and disassembly - ideas discussed, analysis and decisions taken.
- Concept and Developed Design stages: drawings or building information model (BIM).
- All stages: meeting notes, construction programme, responsibilities schedule (indicating parties consulted).

BREEAM Assessors should use their judgement to determine whether the aim and intent of each credit has been met (using appropriate project information to support the decision).

Definitions

Adaptability

Ability to be changed or modified to make suitable for a particular purpose.

Building disassembly and adaptability manual

The manual can be in the form of an analogue document, or an Asset Information Model from the Building Information Model (BIM). For information on what the guide could include, see ISO 20887.

Disassembly

Non-destructive taking-apart of a construction works or constructed asset into constituent materials or components.

Additional information

Example design measures for adaptability

Examples of adaptability design measures that may be adopted for each assessment part when considering versatility, convertibility, and expandability are provided in Table 78 below.

Table 78: Examples of design measures allowing adaptability

Principles for adaptability	Examples of design measures and aspects to consider for specific building elements		
	Interior systems	Building services (within tenant scope)	Furniture, fixtures, and finishes
Versatility	— Use of modular and demountable partitions that allow quick reconfiguration of spaces without replacement. — Incorporation of universal ceiling grids and raised floors that can accommodate various space functions. — Provision of shared or flexible zones.	— Use of plug-and-play service connections (e.g. modular lighting, quick-connect small-power systems). — Service routes accessible for reconnection or extension. — Shared service hubs for multiple functions.	— Use of movable or reconfigurable furniture systems. — Neutral finishes and colour schemes allowing future adaptation to different uses. — Durable materials that withstand multiple reuses or relocations.
Convertibility	— Standardised grid layouts for partitions, ceilings, and raised floors to enable layout changes without waste. — Provision for non-load-bearing partitions that can be relocated. — Use of modular joinery and storage units adaptable to different configurations.	— Oversized or adaptable trunking and cable trays to permit additional circuits or data cabling. — Zonal lighting controls to suit future layouts. — Accessible service voids for upgrades without major disruption.	— Finishes applied with mechanical fixings instead of adhesives for easy replacement. — Carpet tiles or panels that can be replaced individually. — Furniture specified for disassembly and reuse.

Principles for adaptability	Examples of design measures and aspects to consider for specific building elements		
	Interior systems	Building services (within tenant scope)	Furniture, fixtures, and finishes
Scalability	— Interior layouts designed around repeating modular bays that can be expanded or contracted with minimal change. — Clear interface zones for potential connection to adjoining tenancies.	— Capacity in small-power and data infrastructure to support additional workstations or equipment. — Allowance for integration with future smart or IoT systems.	— Flexible space allocation to accommodate future density changes. — Modular furniture systems capable of expansion or integration with new components.

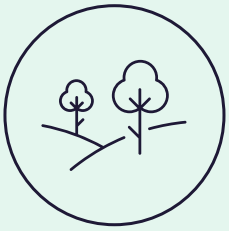
Example design measures for disassembly

Examples of considerations when designing for disassembly are provided in Table 79 below.

Table 79: Examples of design measures and aspects to consider regarding future disassembly

Principles for disassembly	Examples of design measures and aspects to consider for interior systems
Ease of access to components and services	— Use exposed, reversible, or accessible connections for partitions, ceilings, raised floors, and lighting systems. — Allow sufficient clearance and access panels in ceiling and floor voids for future removal or maintenance. — Avoid poured, bonded, or welded joints, and use mechanical fixings (clips, screws) that can be released without damaging adjoining materials. — Design ceiling grids and raised-floor tiles for selective removal and replacement without disrupting adjacent panels.
Independence	— Separate layers and systems so that each can be removed independently (e.g. services in ceiling voids, modular partitions not integral to structure). — Use non-load-bearing, free-standing partitions that can be relocated without affecting structure or finishes. — Employ layering logic for interiors similar to “Shearing Layers” thinking—services, space plan, and furniture remain decoupled to reflect differing lifespans.
Supporting re-use and circular economy models	— Specify systems with take-back, re-manufacture, or refurbishment schemes offered by suppliers. — Choose materials and finishes that can be refurbished, re-laminated, or refinished instead of replaced. — Use modular products with documented re-use markets (e.g. ceiling tiles, raised-floor panels, acoustic baffles). — Record product details and disassembly instructions within the Interior Systems Disassembly & Reconfiguration Manual to facilitate future reuse.
Standardisation	— Adopt common grid dimensions across ceiling, partition, and furniture systems to support interchangeability. — Use standard connection types and fixings compatible across multiple manufacturers. — Select materials available in standard sheet or panel sizes to minimise cutting waste and maximise future reuse.
Modularity	— Employ modular components that can be assembled or dismantled in sequence, such as clip-fit ceiling panels, panelised partitions, and modular workstations. — Group interior elements into repeatable, replaceable modules so damaged sections can be swapped without full replacement. — Coordinate modular systems to shared reference grids to maintain compatibility across future refurbishments.

Land use and ecology



Summary

This category does not apply to fit out assessments.

Assessment issues

Lue 01 Site selection	-
Lue 02 Ecological risks and opportunities	-
Lue 03 Managing impacts on ecology	-
Lue 04 Ecological change and enhancement	-
Lue 05 Long term ecological management	-

Lue 01 Site selection

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Lue 02 Ecological risks and opportunities

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Lue 03 Managing impacts on ecology

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Lue 04 Ecological change and enhancement

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Lue 05 Long term ecological management

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Pollution



Summary

This category addresses the prevention and control of pollution associated with the building's location and use. The issues in this section aim to mitigate the building's impact on surrounding communities and the environment by managing air and water emissions, as well as light and noise pollution.

Assessment issues

Pol 01 Impact of refrigerants	3 credits
Pol 02 Local air quality	3 credits
Pol 03 Minimising watercourse pollution	-
Pol 04 Reduction of nighttime light pollution	1 credit
Pol 05 Reduction of noise pollution	1 credit

Pol 01 Impact of refrigerants

(all buildings)

Aim

To reduce the impact of greenhouse gas emissions arising from the leakage of refrigerants used in heating and cooling systems in the building.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	3	Outstanding	All (scope dependent, see ref 1.0 - 1.2)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Local services** This issue applies only where refrigerant-containing systems are located within the assessed fit-out area. This includes local systems such as split units or standalone air-conditioning systems that serve only the refurbished or tenanted space. Where systems in the assessed area are connected to a central system and the refrigerant is located outside the fit-out boundary, the refrigerant element is outside the scope of this manual and is not assessed under this issue. Systems that serve multiple areas beyond the assessed space are also considered out of scope and are not assessed under this issue.
1.1	**Fit-out scope** If the assessed fit-out area does not include any refrigerant-containing local services (e.g. no tenant-installed cooling systems), and the design avoids the need for them, the available credits can be awarded.
1.2	**Display chiller cabinets and display freezers** This issue is applicable where standalone display cabinets or freezers containing refrigerants are specified as part of the fit-out scope. These must be assessed under this issue, regardless of refrigerant charge, including systems with a charge of 6 kg or less. Where display chillers or freezers are connected to a centralised refrigeration system or chiller plant, this issue does not apply.

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	**Unoccupied or non-conditioned buildings** Credits under this issue should be filtered out where none of the internal areas of the building are intended to be occupied, including cold storage, or contain process-based cooling loads such as those required for server rooms or specialist equipment.

Assessment criteria

Three credits – No refrigerant use

1 Where no refrigerants are required across the building or site within any installed plant or systems, including both refurbished and non-refurbished areas.

Up to three credits – Buildings with systems that use refrigerants

Prerequisite – Systems with refrigerants

2 All systems with electric compressors must comply with relevant safety standards for installing refrigerant systems (see M2.1).

3 The refrigerants used must have an ozone depletion potential of zero (see M2.2).

Up to two credits – Impact of refrigerant

One credit

4 Systems using refrigerants (see M3) must have an average direct effect life cycle (DELC) carbon dioxide equivalent (CO_2e) emission rate of < 1000 $kgCO_2e$ per kW of cooling or heating capacity.

Two credits

5 Systems using refrigerants (see M3) must either:

5.a Have an average direct effect life cycle (DELC) carbon dioxide equivalent (CO_2e) emission rate of < 100 $kgCO_2e$ per kW cooling or heating capacity.

OR

5.b Use a refrigerant with a global warming potential (GWP) of < 10 $kgCO_2e/kg$.

One credit – Leak detection

6 Systems using refrigerants are either:

6.a Hermetically sealed.

OR

6.b The refrigerant charge volume is < 500 tonnes of carbon dioxide equivalent (CO_2e).

OR

6.c Use environmentally benign refrigerants (see M4.1).

OR

7 There must be either:

7.a A permanent automated refrigerant leak detection system that is capable of continuously monitoring for leaks.

OR

7.b An inbuilt automated diagnostic procedure for detecting leakage capable of continuously monitoring for leaks.

8 The leak detection system facilitates the isolation and containment of the remaining refrigerant charge in response to a leak detection incident.

Methodology

M1: Refrigerant systems included in the assessment

All fixed refrigerant systems in the building must be included in the assessment. This includes commercial display cabinets and freezers, even where the refrigerant charge is 6 kg or less, except for:

- Systems used for industrial processes.
- Systems that form part of on-site district heating or district cooling generators where the design team has no control over the specification of the system.
- Small appliances with self-contained refrigeration systems.
- Existing systems that aren't being upgraded may also be excluded.

M2: Prerequisite – Systems with refrigerants

M2.1: Safety standards for installation of refrigeration systems

Relevant safety standards include:

- EN 378-3:2016+A1:2020 – Refrigerating systems and heat pumps. Safety and environmental requirements – Installation site and personal protection
- ISO 5149:2014 – Refrigeration systems and heat pumps
- ASHRAE 15-2016 – Safety Standard for Refrigeration Systems
- Safety Code of Practice for Ammonia Refrigerant R717 – Institute of Refrigeration
- GBT9237-2017 Standard for Safety and Environmental Requirements for Refrigeration Systems and Heat Pumps

M2.2: Ozone depletion potential

Refrigerants that contain neither chlorine nor bromine will have an ozone depletion potential (ODP) of zero. Zero-ODP options include, but are not limited to, the following classifications:

1. Natural Fluids & Inorganics

- Air
- Water (R-718)
- Carbon dioxide (R-744)
- Ammonia (R-717)
- Lithium bromide

2. Pure Hydrofluorocarbons (HFCs)

- R-32 (Difluoromethane)
- R-125 (Pentafluoroethane)
- R-134a (Norflurane)
- R-143a (Trifluoroethane)
- R-152a (Difluoroethane)

3. Pure Hydrofluoroolefins (HFOs)

- R-1234ze
- R-1234yf

4. Hydrocarbons (HCs)

- R-170 (Ethane)
- R-290 (Propane)
- R-600 (Butane)
- R-600a (Isobutane)

- R-1270 (Propene)
- R-290/R170 (Hydrocarbon Blend)

5. Standard HFC & HFO Blends

- R-404A
- R-407C
- R-410A
- R-413A
- R-417A
- R-454B
- R-507A
- R-513A

M3: Impact of refrigerants

The following information must be entered into the BREEAM Platform for each refrigeration system:

- Refrigeration system type
- Maximum cooling or heating output (kW rating)
- Refrigerant type
- Refrigerant charge (kg)

The following system specific information should also be entered or confirmed in the BREEAM Platform, where it is available:

- Annual leakage rate (% refrigerant charge)
- Annual purge release factor (% refrigerant charge)
- Annual service release (% refrigerant charge)

If this information is not available, default values will be used based on the system type.

The most appropriate system type must be selected from the following list.

- Cold storage and display systems: Integral cabinets
- Cold storage and display systems: Split/condensing units
- Cold storage and display systems: Centralised
- Industrial cold storage
- Air conditioning systems: Unitary split
- Air conditioning systems: Chillers
- Air conditioning systems: Heat pumps

Where more than one air-conditioning or refrigeration system is installed in the building, relevant technical data for each system must be entered in the BREEAM Platform.

Where a system uses several different refrigerants (for example, a primary refrigerant and a secondary coolant, or a cascade), then relevant technical data for each type of refrigerant used must be entered into the BREEAM Platform.

Where the refrigerant system provides heating and cooling (reversible heat pump), the highest kW output value should be entered into the BREEAM Platform.

The BREEAM Platform automatically calculates the number of credits achieved based on the information entered.

M3.1: Global warming potential

The global warming potential (GWP) data for refrigerants is included in the BREEAM Platform and is used to determine systems which meet the GWP limit.

Refrigerants with a GWP of less than 10 $kgCO_2e/kg$ are shown in Table 80 on the next page.

Table 80: Refrigerants with a GWP of less than 10 $kgCO_2e/kg$

Refrigerant	GWP, $kgCO_2e/kg$
R718 = water	0
R717 = ammonia	0
R600 = butane	0.006
R290 = propane	0.06
R170 = ethane	0.437
Carbon dioxide (R744)	1
R1234yf*	1
R1234ze*	1
R1270 = propene	2
R600A = isobutane	3
HFC-161	4
R601 = pentane	5
R601A = isopentane	5
* There is no specific figure available, however it is known that the GWP factor is < 1 $kgCO_2e/kg$	

M3.2: Direct effect life cycle (DELC) carbon dioxide equivalent

This measures the global warming arising from fugitive refrigerant gas leakage over the lifetime of the system in $kgCO_2e$ and is calculated automatically in the BREEAM Platform based on information entered about the installed refrigeration systems.

M4: Leak detection

M4.1: Leak detection – Benign refrigerants

Systems that use only environmentally benign refrigerants are exempt from the requirement to install automated leak detection hardware. The following refrigerants are considered environmentally benign:

- Air
- Water (R-718)
- Carbon dioxide (R-744)
- Ammonia (R-717)
- Propane (R-290)
- Butane (R-600)
- Lithium bromide (R-600a)
- Solid refrigerants (including thermoelectric and caloric cooling systems)

M4.2: Leak detection – Permanent automated refrigerant leak detection system

The tonnes of carbon dioxide equivalent for a system are calculated by multiplying the refrigerant mass by the refrigerant's GWP.

To qualify for this issue, the leak detection system must:

- Be a permanent installation
- Continuously monitor the atmosphere in the vicinity of refrigeration equipment
- Be calibrated to detect the refrigerant gases in the installed system(s)
- Raise an alarm when a pre-set level of refrigerant is detected.
- Have undergone testing against an appropriate standard

Appropriate standards for testing include:

- Performance of portable locating leak detectors and of fixed gas detectors for all refrigerants EN 14624:2020
- ANSI/ASHRAE Standard 15-2022 Safety Standard for Refrigeration systems
- IEC 60335-2-40 Edition 6

Note: A system that uses pressure changes to detect leaks is not necessarily compliant, as natural pressure fluctuations can occur during normal operation. To be deemed compliant this type of leak detection system would need to monitor the refrigerant pressure and the operating conditions to address the problem of natural fluctuation to prevent false alarms.

M4.3: Leak detection – Isolating and containment the remaining refrigerant charge

Examples of a system which could meet the leak isolation and containment requirements include:

- Systems that initiate an automated shut down and pump down of the refrigerant into a separate storage tank.
- Systems that send an alarm to a facilities manager or an engineer to facilitate manual system shutdown and isolation of the refrigerant charge.

Compliance notes

None.

Evidence

Criteria	Interim design stage	Final post-construction stage
All	Letter from M&E engineer or specification document confirming the absence of refrigerants in the development. OR Relevant section or clauses of the building specification or contract or letter of confirmation from the M&E engineer. AND Where specified, manufacturer's literature or data sheets confirming the relevant refrigeration type and system information.	Assessor's site inspection report and photographic evidence. Final construction drawings or equivalent. Manufacturer's product details confirming data for installed systems. Evidence to show that systems are installed in line with the relevant safety standards.
Prerequisite (2-3)	Confirmation of compliance with the standards or codes of practice required to meet the prerequisite should be provided by the relevant members of the project team, i.e. the system designer and/or the system installer, as appropriate. This recognises the responsibilities of those designing and installing the system configuration. Evidence from the manufacturer is not required.	No further actions required post-construction.

Definitions

Direct effect life cycle (DELC) carbon dioxide equivalent

DELC is a measure of the effect on global warming arising from emissions of refrigerant (in the case of this BREEAM assessment issue) from the equipment to the atmosphere over its lifetime (units: $kgCO_2e$). The calculation involves estimating the total refrigerant release whilst the refrigerant system is in operation and converting this to $kgCO_2e$.

The direct effect life cycle $kgCO_2e$ emissions (DELC) per kW of cooling and heating capacity is calculated within the BREEAM Platform using the following equation:

$$\frac{[RLO + RLSR] \times GWP}{CC}$$

where:

$$\text{Refrigerant loss operational (RLO)} = (Ref_{charge} \times Sys_{op\text{-}life} \times (L1 + L2 + S1 + S2))/100$$

$$\text{Refrigerant loss system retirement (RLSR)} = Ref_{charge} \times (1 - Ref_{RecEff}/100)$$

and where:

1. Ref_{charge} = Refrigerant charge (kg)
2. $Sys_{op\text{-}life}$ = System operational lifetime (years)
3. Ref_{RecEff} = Refrigerant recovery efficiency factor (%)
4. L1 = Annual leakage rate (% refrigerant charge)
5. L2 = Annual purge release factor (% refrigerant charge)
6. S1 = Annual service release (% refrigerant charge)
7. S2 = Probability factor for catastrophic failure (% refrigerant charge loss/year)
8. GWP = Global warming potential of refrigerant
9. CC = Cooling or heating capacity (kW)

Global warming potential (GWP)

Global warming potential (GWP) is defined as the potential for global warming that a chemical has relative to a unit of carbon dioxide, the primary greenhouse gas. In determining the GWP of the refrigerant, the Intergovernmental Panel on Climate Change (IPCC) methodology using a 100-year Integrated Time Horizon (ITH) is applied.

Green lease

A green lease is a contract that includes additional clauses which provide for the management and improvement of the environmental performance of a building by both owners and occupiers. To be acceptable for BREEAM a green lease agreement must cover all relevant BREEAM requirements and must be signed by both the lessor and the lessee or, where the lessee is unknown, a commitment must be provided by the client that the green lease agreement will be implemented when the building is let.

Hermetically sealed systems

In a hermetically sealed system all refrigerant containing parts are made tight by welding, brazing or a similar permanent connection which may include capped valves and capped service ports that allow proper repair or disposal and which have a tested leakage rate of less than three grams per year. This results in the risk of a large refrigerant leak due to system failure being minimised.

Industrial process

An industrial process is a procedure that involves chemical, physical, electrical, or mechanical steps and is used to manufacture items and is usually carried out on a very large scale.

Ozone depletion potential (ODP)

Ozone depletion potential (ODP) is the ratio of the relative amount of degradation to the ozone layer caused by a particular substance relative to the calculated depletion for the reference gas CFC-11 (ODP = 1.0).

Refrigerant gases

There are three main classes of refrigerants:

1. Hydrogenated fluorocarbon refrigerants (HFCs) are made up of hydrogen, fluorine, and carbon. Because they do not use a chlorine atom (which is used in most refrigerants) they are known to be one of the least damaging to the earth's ozone layer.
2. Hydrogenated chlorofluorocarbon refrigerants (HCFCs) are made up of hydrogen, chlorine, fluorine, and carbon. These refrigerants contain minimal amounts of chlorine; they are not as detrimental to the environment as some other refrigerants.
3. Chlorofluorocarbon refrigerants (CFCs) contain chlorine, fluorine and carbon. These refrigerants carry high amounts of chlorine so they are known to be the most hazardous to the ozone layer.

The use of CFCs and HCFCs as refrigerants has been addressed under the Montreal Protocol. Phase out programmes have been agreed resulting in these substances no longer being used as refrigerants in all new installations and most existing situations. The industry's favoured replacements are currently HFCs which are often potent global warming contributors.

Hydrocarbons and ammonia-based refrigerants have low or zero GWP and are therefore preferred long term options. These are now widely available and are valid alternatives to HFCs in all buildings, provided health and safety issues are fully addressed.

Refrigerant leak detection

An automated permanently installed multi-point sensing system, designed to continuously monitor the atmosphere in the vicinity of refrigeration equipment and, in the event of detection, raise an alarm. The system may be aspirated or have multiple sensor heads linked to a central alarm unit or BMS. Various sensor types are available including infrared, semiconductor, or electro-chemical.

Refrigerant pump down

The specification of automatic refrigerant pump down can further limit potential losses and damage to the environment and have subsequent economic benefits to the building owner.

Many countries around the world classify refrigerants and refrigerating oil as controlled or hazardous waste and regulate their transport, storage, transfer, and disposal.

Refrigerant recovery

The process of removing refrigerant from a system and storing it in an airtight container.

Small self-contained appliances

These include domestic scale fridges and freezers and individual display cabinets (for example, drinks cabinets in retail shops).

Additional information

DELC calculations

The formula used to calculate the direct effect life cycle CO_2e emissions in BREEAM is based on the Total Equivalent Warming Impact (TEWI) calculation method for new stationary refrigeration and air-conditioning systems. TEWI is a measure of the global warming impact of equipment that takes into account both direct emissions (as assessed in this BREEAM issue) and indirect emissions produced through the energy consumed in operating the equipment (which is assessed in the BREEAM energy section).

For further details, see EN 378-1[64] and the British Refrigeration Association's (BRA) Guideline Methods of Calculating TEWI.

Safe use of HCFC alternatives

The United Nations Environment Programme (UNEP) provide information about the management and phase out of HCFCs and alternatives to HCFCs in the refrigeration and air-conditioning sector, including in their report *Safe use of HCFC alternatives in refrigeration and air-conditioning*.[65]

Pol 02 Local air quality

(all buildings)

Aim

To contribute to a reduction in local air pollution through the use of no or low-emission combustion plant in the building.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	3	None	All (scope dependent, see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Local services** Local services are defined as systems that supply a specific area only, such as a local heating or cooling unit or a point-of-use water heater. Where heating, cooling, or hot water demand is met by a centralised building system (i.e. core services), this issue is not applicable.

Building type specific notes

Ref	Building type specific note
-	None

Assessment criteria

Up to three credits – No or low emission combustion plant

Three credits – No installed combustion plant

1 All space heating and domestic hot water are supplied by non-combustion systems on-site.

Up to two credits – Low-emission combustion plant

2 Emissions from all installed combustion plant that provide space heating or domestic hot water do not exceed the levels set in Table 81 below.

Table 81: Credits awarded based on NO_x emission levels (mg/kWh) by population density

Maximum mg NO_x/kWh fuel input in terms of gross calorific value (GCV)		Credits
Low population locations	High population locations	
56	27	1 credit
27	24	2 credits

Methodology

M1: Low-emission combustion plant

All items of installed combustion plant that burn either fossil fuel or biomass derived fuels must meet the NO_x emission limit for credits to be awarded.

M1.1: Determining population density

Population density is the number of people per unit of geographic area. It is calculated by dividing the total population of an area by its total land area in people per square kilometre, per hectare or per square mile.

For this issue:

— Low population density is defined as less than 1000 people per square kilometre.

A searchable population density dataset – Human Population Density (Global - Annual - 1 km) – is available from the Food and Agriculture Organization of the United Nations.

M1.2: Determining NO_x emission levels

NO_x emissions must be from manufacturers' data, for example, under the requirements of the Ecodesign Directive 2009/125/EC.

NO_x emissions for all heat sources should be measured under normal operating conditions, which are when all heat sources from the building plant operate to their maximum design heat outputs to meet the building's heating demands.

Where the plant is designed to operate below maximum capacity, for example, multiple or modular systems or standby boilers, the emissions should still be calculated for the plant operating to meet the building's heating demand.

Where manufacturer's data cannot be obtained in mgNO_x/kWh fuel input in terms of GCV on a dry basis the following conversions may be applied:

— Data provided in mg/m³ multiply by 0.859
— Data provided in ppm/kWh multiply by 1.76
— Data provided as mg/MJ multiply by 3.6
— Data provided on a wet NO_x basis multiply by 100/(100-%water vapour)
— Data provided at 3% excess oxygen multiply by 1.17
— Data provided at 6% excess oxygen multiply by 1.4
— Data provided at 15% excess oxygen multiply by 3.54

Compliance notes

Ref	Terms	Description
CN1	Back-up space or water heating systems	Back-up space or water heating systems that will only be used in emergency systems can be excluded from the assessment.
CN2	Open flues	No credits may be awarded for open flue heating or hot water systems.
CN3	District heating	Where a project is connected to a district heating system which is outside the scope of the project or the wider development (e.g. phased developments), the system does not need to be included in the assessment. This is on the basis that the design team do not have control over the specification of the system. Where the design team do have control over the specification of the system, then it must be assessed, and all combustion plant must meet the limits.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Design drawings, relevant sections of the building specifications or contract clauses that identify all heat-generating equipment for space heating and domestic hot water in the building.	Final construction or equivalent drawings or equipment schedules that identify all heat-generating equipment for space heating and domestic hot water in the building. OR Assessor's site inspection report and photographic evidence showing the installed equipment.

Criteria	Interim design stage	Final post-construction stage
2	Design drawings, relevant section of the building specification or contract clauses confirming either: Commitment to meet maximum NO_x ratings for heat generators. OR Where known, details of specified plant and supporting manufacturer's product data sheets. For low population areas, evidence to support population density.	Final construction or equivalent drawings or equipment schedules that identify all heat-generating equipment for space heating and domestic hot water in the building. Manufacturer's product data sheets for installed systems. Documentary evidence to support the installation of the specified equipment such as: Assessor's site inspection report and photographic evidence. OR Copies of purchase orders, invoices or delivery tickets.

Definitions

Gross calorific value (GCV)

The total amount of heat energy released when a substance undergoes complete combustion in oxygen. This is sometimes referred to as the higher heating value. See also, net calorific value (NCV).

Net calorific value (NCV)

The amount of heat energy released when a substance undergoes complete combustion in oxygen minus heat used to vapourise the water that is generated during the combustion process. This is sometimes referred to as the lower heating value. See also, gross calorific value (GCV).

NO_x emissions

This refers to the nitrogen oxide gases – nitric oxide and nitrogen dioxide – that are produced when fuel is burned. NO_x is a major source of air pollution.

Additional information

None.

Pol 03 Minimising watercourse pollution

(not applicable)

This issue is not assessed in BREEAM Fit Out Commercial V7.

Pol 04 Reduction of nighttime light pollution

(all buildings)

Aim

To ensure that lighting is concentrated in appropriate areas, minimise upward light, and reduce obtrusive light pollution. This aims to limit unnecessary energy consumption, minimise nuisance to neighbouring properties, and mitigate adverse impacts on transport systems and natural habitats.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All (see ref 1.0)

Assessment type specific notes

Ref	Assessment type specific note
1.0	**Scope of work** Where a criterion (2, 3, or 4) is not relevant to the scope of a particular part of the fit out works, it may be considered not applicable, provided there is justification through design team confirmation.

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	**No exterior lighting** Where the fit-out does not include any lighting (external or internal) that illuminates external spaces or façades after dark, this issue is not applicable.

Assessment criteria

One credit – Reduction of light pollution

1 Light pollution has been eliminated through effective design that removes the need for artificial lighting at night. This does not adversely affect the safety and security of the site and its users.

OR alternatively, where the assessed area does use artificial lighting at night, one credit can be awarded as follows:

2 The lighting strategy has been designed to reduce obtrusive light. This includes both external lighting and internal lighting in spaces with glazed apertures.

3 A curfew is established for all external lighting (except for safety and security lighting), which is automatically switched off between 23:00 and 07:00.

4 Illuminated advertisements are designed to control brightness and minimise visual disturbance during nighttime hours.

5 Lighting is designed to minimise impacts on nocturnal wildlife.

Methodology

M1: Lighting guidelines

The following guides when and how to apply the criteria to the lighting associated with the assessed area.

1. **Assessment scope:** Only areas of the fit-out where lighting is newly installed, replaced, or significantly modified as part of the works need to be assessed.
2. **Determining lighting types:** The design team and the assessor are responsible for determining which lights are provided for safety and security purposes and which should be considered general lighting. The type of safety and security lighting depends on the project and the location of the lighting.
3. **External areas lit by internally mounted lighting:** 'external lighting' includes both lighting mounted externally and lighting mounted inside a building primarily intended to enhance its external appearance or light external spaces after dark.
4. **Operational hours exemption:** During hours of operation between 23:00 and 07:00, lighting required for operational reasons does not have to be modified for BREEAM compliance.
5. **Exemptions for security purposes:** When specified light fittings adhere to particular security standards that conflict with BREEAM criteria, they may be exempt from assessment in this issue. In such cases, the assessor must procure evidence verifying the specific security standards' applicability to the assessed development.
6. **Exclusion of flush stud lights:** Flush stud lights are generally outside the scope of fit-out works. Where they are newly specified as part of the project, they may be excluded from assessment if installed solely for vehicle safety purposes. In these circumstances, the assessor must obtain evidence confirming the specific security standards and that they apply to the assessed development.
7. **Illuminated advertisements:** All types of illuminated advertisements, both self-illuminated and those illuminated by reflection from other sources, must meet the criteria.

M2: Reduction of obtrusive light

The lighting strategy design should follow the five sets of recommendations outlined in the following two Commission Internationale De L'Eclairage (CIE) guides, which provide guidance to the mitigation of obtrusive light:

— CIE 150:2017 *Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations*

— CIE 126:1997 *Guidelines for Minimizing Sky Glow*

The five sets of recommendations:

1. Limitation of illumination on surrounding premises
2. Limitation of bright luminaires in the field of view
3. Limitation of the effects on transport systems
4. Limitation of skyglow
5. Limitations of the effect of over-lit building facades and signs

The lighting strategy design must comply with the limits set for light technical parameters in Table 1 to Table 7 of CIE 150:2017 (including their accompanying notes) and Table 2 of CIE 126:1997.

For cut-off type and angled luminaires which (by design) block out light in obstructive directions, calculations are not required for meeting requirements relating to:

— Vertical illuminance (Table 2 of CIE 150:2017), and

— Luminous intensity (Table 3 of CIE 150:2017).

Compliance with the Institution of Lighting Professionals (ILP) GN01/21 for the reduction of obtrusive light ensures alignment with the requirements of CIE 150:2017 and CIE 126:1997. ILP GN01/21 is available free of charge from the ILP website (www.theilp.org.uk).

M3: Setting a curfew

This will normally include floodlighting, signage, and all lighting that is not required for safety or security. Illuminated advertisements may be excluded from this requirement but will need to comply with different levels of maximum luminance depending on the surrounding and background environment (see criterion 4 and M4).

Where safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system must comply with the lower lighting levels recommended during these hours in Table 2 to Table 7 of CIE 150:2017.

Where a different curfew time applies for other reasons (e.g., noise control), consideration should be given to coordinating the curfews, e.g., allowing sufficient time of operation for the lighting after the conclusion of the activity to facilitate crowd dispersal, particularly where large numbers of spectators are involved.

M4: Illuminated advertisements

The principles outlined in CIE 150:2017 and CIE 126:1997 should be applied to external and internal outward facing illuminated advertisements, including digital displays

The maximum luminance values depend on the building's location (see Table 82 below).

Table 83 below outlines the maximum luminance (cd/m²) permitted at any point on the surface of an illuminated advertisement during nighttime hours.

Table 82: Environmental lighting zone

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark	Astronomical observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark	National parks or protected sites, areas of outstanding natural beauty, relatively uninhabited rural areas
E2	Rural	Low district brightness	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town centres and commercial districts with high levels of nighttime activity

Table 83: Recommendations for maximum nighttime permitted values of display luminance (cd/m²), adapted from PLG05

Illuminated area (m²)	Zone E0	Zone E1	Zone E2	Zone E3	Zone E4
0 to < 5	0	25	200	300	300
5 to < 20	0	0	200	300	300
≥ 20	0	0	100	200	300

The values in Table 83 apply to pre-curfew. The post-curfew levels shall generally be the display being off, unless (in Zone E2 to Zone E4 inclusive) the installation is still required to be operational, in which case the performance level should be 50% of the pre-curfew level.

The values in Table 83 do not apply to signs for traffic control purposes.

M5: Nocturnal wildlife

Assessments must demonstrate how the potential impacts of both external and internal lighting have been considered. This applies according to the project scope, the building or the assessment area. The requirement is relevant where the building is located near ecologically sensitive areas or nocturnal wildlife habitats, as well as in areas where lighting may increase the risk of

bird collisions. These considerations cover all nocturnal species, including bats, birds, and other wildlife.

To minimise impacts from unnecessary night-time lighting, the following should be considered:

- **Identify habitats:** Determine the presence or potential for nocturnal wildlife and key habitats and assess their ecological importance.
- **Preserve darkness:** Avoid any lighting on key habitats to maintain complete darkness.
- Apply mitigation measures and sensitive design. For example:
  - Based on habitat value, dark buffers and concentric zonation should be established with appropriate buffer widths and illuminance limits.
  - Selecting suitable luminaires and site configurations.
  - Implementing physical screening to block light spills.

Reducing unnecessary internal and external night-time lighting helps protect nocturnal wildlife. It reduces the risk of bird collisions, particularly for migratory and nocturnal species that rely on natural light cues for navigation.

Compliance notes

Ref	Terms	Description
CN1	Best practices / National and international frameworks	Projects are encouraged to consider best practices, and national and international frameworks that help to address the criteria on this issue. Examples include the International Dark-Sky Association (IDA) which provide universal principles for reducing light pollution. Adhering to these frameworks supports compliance with the criteria and demonstrates a commitment to minimising obtrusive light pollution impacts.
CN2	Maximum luminance	When considering the zone in which an advertising sign is, or is intended to be, sited, the contrast with the surrounding or background should be considered (e.g. the surrounding could be unlit when viewed from the road or a residential window) and the zone adjusted accordingly. Where an illuminated sign lies on the boundary of two zones or can be observed from another zone, the illumination level used should be that applicable to the most rigorous zone.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Written confirmation from appropriate member of the design team or design drawings to confirm that there is no artificial lighting at night.	Assessor's site inspection report and photographic evidence.
2–5	Relevant section or clauses of the building specification or contract. OR Letter of commitment. OR Where available, design drawings and lighting design data or calculations. The M&E engineer or lighting designer must provide indicative examples of where and how the strategy complies with the assessment criteria.	Evidence, including indicative examples, to demonstrate how the installed lighting meets the criteria requirement. This could include where relevant: — Final construction or equivalent lighting layout drawings. — Lighting calculations. — A statement from the M&E engineer or lighting designer. — Manufacturer's literature for the installed luminaires.

Definitions

Bird collision

The impact of a bird with a building structure, often resulting in injury or death. Collisions commonly occur when birds are disoriented by artificial lighting or cannot perceive transparent or reflective surfaces such as glass façades, particularly during migration or in low-light conditions.

Complete darkness

Achieving complete darkness is not feasible in areas where any form of lighting is present. For the purposes of BREEAM, complete darkness is defined as illuminance levels at or below 0.2 lux on the horizontal plane and 0.4 lux on the vertical plane. These thresholds align with recommendations for maintaining suitable conditions for light-averse nocturnal wildlife.

Curfew

A designated time period during which all non-essential external lighting (e.g. general and decorative lighting) is automatically switched off to reduce light pollution.

Dark buffers

Unlit or minimally lit zones established around key habitats to minimise light intrusion.

Environmental lighting zones

Categories defining the surrounding lighting environment, ranging from Zone E0 (Dark/Protected) to Zone E4 (Urban). See Table 82 on page 297.

Illuminated advertisements

An advertisement designed or adapted to be illuminated by artificial lighting, directly or by reflection. It also includes any billboard or similar structure used, designed or adapted for the display of advertisements, including self-illuminated and externally illuminated types.

Nocturnal wildlife habitats

Areas that provide living, breeding, or foraging space for nocturnal species. These may include both ecologically rich sites and areas of lower ecological quality where nocturnal wildlife is active and should be considered.

Obtrusive light

Any light that creates unwanted or excessive illumination beyond the intended area, causing adverse effects such as glare, light trespass, or skyglow.

Additional information

None.

Pol 05 Reduction of noise pollution

(all buildings)

Aim

To reduce the likelihood of noise arising from fixed installations on the new development affecting nearby noise-sensitive buildings.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
Fit out	1	None	All

Assessment type specific notes

Ref	Assessment type specific note
-	None

Building type specific notes

Ref	Building type specific note
-	None

Issue specific notes

Ref	Issue specific note
3.0	**Applicability** This issue applies where the assessed works include existing or newly installed externally mounted plant or where fabric measures could influence noise levels affecting nearby noise-sensitive buildings or spaces.
3.1	**No occupied areas and no noise-generating plant or equipment** Where the assessed area is not intended to be occupied, or where no plant or equipment capable of generating noise is present or specified, the requirements of this issue do not apply. In these situations, the relevant credits should be filtered out, as the issue does not apply to those areas.

Assessment criteria

One credit – Noise level

1 A preliminary noise screening, prepared or verified by a suitably qualified acoustician (SQA), must identify any noise-sensitive receptors within 800 m and assess the risk of significant impact from fixed building services.

2 Where the screening identifies noise-sensitive receptors within 800 m or a potential for significant noise impact, a full noise impact assessment must be undertaken in accordance with BS 4142:2014+A1:2019 (UK) or ISO 1996 series (International).

3 Where a full noise impact assessment is required, it must be measured or determined for:

3.a Establish existing background noise levels:

3.a.i At the nearest or most exposed noise-sensitive receptor to the proposed assessed development or at a location with demonstrably similar background conditions.

3.a.ii Include measurements of the existing plant on a building, where the assessed development is an extension to the building.

3.b Determine predicted sound level contribution from the assessed building, including all fixed building services and any predictable external activities (see M1 and M2).

4 The noise impact assessment must be carried out by an SQA holding a recognised acoustic qualification and membership of an appropriate professional body (see Definitions).

5 The assessed building's noise contribution must be at least 5 dB below the existing background sound level, at the nearest or most exposed noise-sensitive receptor, during day and night.

5.a **BS 4142:** The compared parameter must be the Rating Level (LAr,Tr), including all applicable acoustic feature corrections.

5.b **ISO 1996:** The parameter must be the assessed LAeq sound level contribution from the installation.

6 If the 5 dB margin is not met, the SQA must specify attenuation measures (e.g. enclosures, barriers, or controls) to achieve compliance.

Methodology

M1: Noise level measurements at the design stage

At the design stage assessment, when noise-sensitive receptors are present, actual measurements may not be feasible due to the absence of the planned installation. In such scenarios, compliance can be demonstrated through acoustical calculations or scale-model predictions.

In accordance with ISO 1996-2:2017 and BS 4142:2014, where direct measurement of ambient noise is impractical or unrepresentative, sound levels must be estimated using recognised calculation methods. The acoustic report must clearly document the calculation approach, input data, and justification for its use.

If no reliable prediction method is available, measurement is required using either:

— A comparable existing noise source, or

— The actual installation is once operational.

Where the latter approach is used (post-installation measurement), the project team must provide a written commitment to:

— Appoint an SQA to carry out post-installation measurements, and

— Implement additional attenuation measures if the resulting Rating Level (or LAeq contribution) does not meet the 5 dB margin below background required by criterion 5.

M2: Noise level measurements post-construction stage

Post-construction noise measurements are not required where the SQA has:

1. Accurately modelled the Rating Level (LAr,Tr) or LAeq contribution using the manufacturer's data and verified site measurements of the background sound level taken at the design stage.
2. Confirmed that all specified attenuation measures have been installed as designed.

If modelling cannot be verified, on-site measurements by the SQA are required to demonstrate the 5 dB threshold is met. Compliance depends on the verified installation of the SQA's recommended measures.

Compliance notes

Ref	Terms	Description
CN1	Natural ventilation	Where the assessment area is designed to use natural ventilation, a separate acoustics report is not required. As natural ventilation does not introduce significant noise, the Pol 05 credit can be awarded by default.

Ref	Terms	Description
CN2	Untreated buildings (e.g. industrial warehouse storage)	This issue does not apply where internal spaces are not serviced by heating, ventilation or air-conditioning systems, and the building does not have noise-generating plants or equipment.
CN3	Standard not appropriate or not applicable	Where a suitably qualified acoustician confirms that ISO 1996:2007 is not an appropriate standard of assessment for the proposed building or site, their assessment of the likelihood of complaints from noise impact can be accepted for the purpose of assessing this issue.
CN4	National or local alternative to ISO standard	It is possible to use a national or local equivalent to the ISO 1996 series; however, this must be approved by BRE Global. The Approved Standards list can be used to check for previously approved standards or to propose a new national or local standard.
CN5	No external plant specified	Where no external plant is specified but occupied areas are present, the project must provide a formal statement from a suitably qualified acoustician confirming that: — There are no significant noise sources associated with the project, and — The proximity of any noise-sensitive receptors has been reviewed. The statement must justify the approach and confirm that the aim of the issue is met.
CN6	Temporary power solutions in noise impact assessments	Plants such as standby generators that are only used temporarily are excluded from the noise impact assessment.
CN7	Low background sound levels	Where background sound levels are low (e.g. at night), no flexibility applies. The criteria, including the required 5 dB reduction, remain valid. The aim is to limit noise impact on sensitive receptors, and the SQA confirms the requirements are appropriate even in quiet environments.

Evidence

Criteria	Interim design stage	Final post-construction stage
1	Design drawings highlighting: 1. All existing and proposed noise-sensitive buildings local to, and within, the site boundary. 2. Proposed sources of noise from the project. 3. Distance (m) from these buildings to the assessed development.	Updated evidence to confirm no noise-sensitive areas or buildings within an 800 m radius of the assessed site. Assessor's site inspection report and photographic evidence.
2–5	The acoustician's noise impact assessment report and evidence to verify the acoustician's qualifications and professional status. AND Commitment to complete post-construction testing. OR Relevant sections of the building specification, contract clauses or letter of commitment requiring a compliant noise assessment to be carried out by a suitably qualified acoustician.	Updated acoustician's report confirming compliance with ISO 1996 / BS 4142:2014 and measured or modelled noise levels from installed plant. Evidence to verify the acoustician's qualifications and professional status. Where relevant, manufacturer's details and final construction drawings or equivalent showing the installed plant. Assessor's site inspection report and photographic evidence.
6	Acoustician's report with recommendations for noise attenuation measures. AND EITHER A marked-up design plan highlighting the specification of the acoustician's attenuation measures.	Assessor's site inspection report and photographic evidence confirming the existence of the specified noise attenuation measures. OR A letter from the acoustician confirming that all

Criteria	Interim design stage	Final post-construction stage
	OR A formal letter from the client or design team confirming where relevant, that attenuation measures recommended by an appointed suitably qualified acoustician will be installed.	specified attenuation measures have been installed to the required standard. OR Manufacturer's details and final construction drawings or equivalent showing installed attenuation measures.

Definitions

Noise-sensitive receptors

Landscapes or buildings where the occupiers are likely to be sensitive to noise created by the new plant installed in the assessed building, including:

1. Residential areas
2. Hospitals, health centres, care homes, doctor's surgeries etc.
3. Schools, colleges and other teaching establishments
4. Libraries
5. Places of worship
6. Wildlife areas, historic landscapes, parks and gardens
7. Located in an area recognised as having outstanding natural beauty, scientific or ecological interest
8. Any other development that can be considered noise-sensitive, as specified by the suitably qualified acoustician.

Suitably qualified acoustician (SQA)

An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:

1. Has a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting acoustics in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.
2. Holds a recognised qualification in acoustics and membership of an appropriate professional body.

Acousticians that meet the definition of a suitably qualified acoustician in Hea 06a Acoustic performance, will also meet the definition for the purposes of compliance with this issue.

Where an SQA is verifying the acoustic measurements or calculations carried out by another acoustician who does not meet the SQA requirements, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to:

1. Represent good industry practice.
2. Be appropriate given the building being assessed and scope of works proposed.
3. Avoid invalid, biased and exaggerated recommendations.

Additionally, written confirmation from the third-party verifier that they comply with the definition of an SQA is required.

Additional information

BS 4142:2014+A1:2019

BS 4142:2014 outlines methods for evaluating and rating industrial and commercial noise that affects nearby residential or noise-sensitive areas. It compares specific sound levels from sources such as building services or plant with existing background noise, including adjustments for tonal, impulsive, or intermittent features, to assess the likelihood of adverse noise impact.

ISO 1996-2:2017

ISO 1996-2:2017 provides guidelines for describing, measuring, and evaluating environmental noise. It includes methods for measuring rating level, assessing noise exposure, and assessing noise's impact on communities. The ISO 1996 standards relate to noise pollution and its effects on human health and well-being in outdoor environments.

Innovation



Summary

The innovation category provides opportunities for exemplary performance and innovation to be recognised that are not included within, or go beyond the requirements of the credit criteria. This includes exemplary performance credits, for where the building 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.

The cost-saving benefits of innovation are fostered and facilitated by helping encourage, drive and publicise accelerated uptake of innovative measures.

Assessment issues

Inn 01 Innovation	up to 10 exemplary

Inn 01 Innovation

(all buildings)

Aim

To support innovation within the construction industry through the recognition of sustainability related benefits which are not rewarded by standard BREEAM issues.

Overview

Assessment type	Credits available	Minimum standards	Applicable assessment criteria
All	10 exemplary	None	All

Assessment criteria

Exemplary level of performance in existing BREEAM issues

1 Where the building demonstrates exemplary performance by meeting defined exemplary level performance criteria in one or more of the following BREEAM assessment issues:

- 1.a Man 05 Aftercare
- 1.b Hea 01 Natural light
- 1.c Hea 02 Electric light
- 1.d Hea 04 Indoor air quality
- 1.e Hea 07 Safe and accessible design
- 1.f Ene 02 Prediction of operational energy and carbon
- 1.g Mat 01 Building life cycle assessment
- 1.h Mat 03 Responsible sourcing of construction products
- 1.i Wst 01 Construction waste management

Refer to each assessment issue for details of the exemplary level performance criteria.

Approved innovations

2 One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an approved innovation application form.

Up to a maximum of 10 exemplary credits are available in aggregate from a combination of criteria 1 and 2 (with the total BREEAM score capped at 100%).

Methodology

M1: Exemplary level of performance

For information on the methodology for exemplary credits refer to the Methodology section of the relevant BREEAM assessment issues.

M2: Approved innovations

Innovation applications can be submitted to BRE Global by a licensed BREEAM Assessor using the formal approved innovation application form (available from BREEAM Projects).

Evidence

Criteria	Interim design stage	Final post-construction stage
1	As defined within the relevant assessment issues.	As defined within the relevant assessment issues.
2	A copy of the approved innovation application form. AND A copy of the innovation application report stating the application outcome as 'approved'. AND Relevant documentary evidence demonstrating specification of the approved innovation.	As per interim design stage. AND Relevant documentary evidence confirming that the project has achieved or installed the approved innovation as described and quantified within the approved innovation application form.

Definitions

Approved innovation

Any new technology, design, construction, operation, maintenance or demolition method or process that can be shown to improve the sustainability performance of a building and is of demonstrable benefit to the wider industry in a manner that is not covered elsewhere in BREEAM. In addition, the innovation has been approved by BRE Global in accordance with its published BREEAM Innovation credit procedures.

Additional information

Applying for approved innovation credits

For more information on BREEAM Innovation credit eligibility criteria, application process, application fees and previously approved innovations, refer to the BREEAM Innovation section documents available from BREEAM Projects.

Appendices

Appendix A – Asset types and sub-types

Appendix B – How BREEAM Fit Out works with other BREEAM schemes

Appendix A – Asset types and sub-types

A full list of asset types and sub-types that can be assessed using BREEAM Fit Out Commercial V7 is given in Table 84 below.

Table 84: List of building types covered under BREEAM Fit Out Commercial V7

Asset category	Asset type	Asset sub-type
Commercial laboratory	Laboratory (CL 2 or 3) (note 1)	-
Community	Coast guard station or mountain rescue station	-
	Community hub, community centre, day centre	-
	Crematorium	-
	Library	-
	Mortuary	-
	Place of worship	-
	Visitor centre	-
Culture and entertainment	Cinema or movie theatre	-
	Exhibition or conference hall	-
	Museum or art gallery	-
	Performing arts theatre or music hall or concert hall	-
Education	Preschool	Nursery school
		Children's centre
		Crèche or daycare
	School	Primary school
		Secondary school
		All age range school
		K-12 school
		Non-acute special educational needs (and disability) school (SEN/SEND)
	Further education institution	Sixth form school or college
		Vocational college
	Higher education institution	College
		University
Government services	Fire station	-
	Holding centre	-
	Law court	-
	Police station	-
	Prison (UK only)	High security closed prison
		Closed prison
		Open prison
		Youth custody establishment
	Town hall	-

Asset category	Asset type	Asset sub-type
Healthcare	Primary healthcare surgery	-
	Health centre or clinic	-
	Hospital	Acute and maternity hospital
		Community and mental health hospital
		Long stay hospital
		Teaching and specialist hospital
	Ambulance station	-
	Ambulatory surgical centre	-
Hospitality	Hotel (STR) (note 2)	Luxury chain
		Upper upscale chain
		Upscale chain
		Upper midscale chain
		Midscale chain
		Economy chain
	Serviced apartment (STR) (note 2)	Luxury chain
		Upper upscale chain
		Upscale chain
		Upper midscale chain
		Midscale chain
		Economy chain
	Hostel	-
	Guest house	-
Industrial	Manufacturing	General manufacturing
		Light manufacturing
	Logistics	Ambient warehouse
		Temperature-controlled warehouse
	Self-storage facility	-
	Vehicle servicing unit	-
	Film or TV studios	-
Office	Office	-
	Financial office	-
	Veterinary office	-
Residential institution	Long term stay	Co-living
		Key worker accommodation
		Local authority secure residential accommodation
		Military barracks
		Residential care home
		Sheltered housing
		Student accommodation (halls of residence)
	Short term stay	Residential training centre
		Short stay housing units

Asset category	Asset type	Asset sub-type
Retail	Bar, pub, drinking establishment	Bar, pub, drinking establishment (with food service)
		Bar, pub, drinking establishment (without food service)
	Café	-
	Convenience store	-
	Fast food restaurant or takeaway	-
	Restaurant	-
	Retail park or warehouse	-
	Retail services	-
	Retail store	Grocery shop or grocery store
		Specialty store (non-food)
	Shopping centre	-
	Showroom	-
	Supermarket	-
	Wholesale club or supercentre	-
Sports and leisure	Fitness centre or gym	-
	Ice rink	-
	Indoor arena	-
	Leisure centre or recreation centre	Leisure centre or recreation centre (with pool)
		Leisure centre or recreation centre (without pool)
	Stadium (closed)	-
	Swimming pool	Swimming pool (indoor)
		Swimming pool (outdoor)
Transport hub	Rail station (above ground)	-
	Airport terminal	-
	Coach or bus station	-
	Maritime passenger terminal	-
	Tram station	-
Bespoke	Building types that are not listed in this table must undergo a scoping and tailoring exercise to facilitate an assessment and rating. For an individual project this involves BRE Global selecting appropriate issues from the existing pool of assessment issues to provide criteria against which the building can be assessed. This is sometimes known as a 'bespoke' assessment. Further guidance on the 'bespoke' process can be found in Guidance Note 23 (GN23).	

Notes to Table 84
1. CL stands for Containment Level as defined in Management, Design and Operation of Microbiological Containment Laboratories 2018, ACDP.
2. STR stands for Smith Travel Research, an organisation that provides market data for the hotel industry worldwide.

Education building types

BREEAM Fit Out Commercial V7 can be used to assess the educational establishments mentioned in Table 84. This BREEAM scheme has not been specifically tailored to assess schools for acute special educational needs and disabilities (SEN/SEND).

Acute SEN/SEND refers to children with severe disabilities or learning difficulties that prevent them from interpreting their surroundings without feeling anxious or distressed. These children can become easily distracted or overstimulated, or both. This group of pupils mainly include children with behavioural, emotional or social difficulties (BEDS) and children with communication and interaction disability (autistic spectrum disorder (ASD)).

Acute SEN/SEND schools therefore require a bespoke assessment. Assessors carrying out assessments on schools for pupils with such needs need to consider carefully all the BREEAM issues that might be affected by the need to provide special facilities for these building users (e.g. view out, cyclist facilities, etc). Where criteria in this scheme document are not explicit for this building type, the assessor will need to decide which criteria are appropriate and apply them accordingly, seeking confirmation from BRE Global on the application of alternative building criteria.

For more information on SEN/SEND please refer to the following documents:

— Building Bulletin 102: Designing for disabled children with special educational needs, published by the Department for Children, Schools and Families.

— Building Bulletin 104: Area guidelines for SEND and alternative provision, published by Department for Education.

Healthcare building types

Typical facilities and services offered by and forming part of one of the healthcare buildings are described in Table 85 below. If a healthcare development does not fit with building types outlined in Table 84 on page 308 and Table 85 below, bespoke assessment criteria will be required to assess the project.

Table 85: Typical facilities and services as part of different healthcare buildings

Typical descriptions	Facility	Service
Teaching and specialist hospital, Long stay hospital	In patient High concentration of energy- intensive engineering services and specialist equipment	Diagnostic and treatment services for physical healthcare together with specialist services, Consultant-led
Acute and maternity hospital	Inpatient Medium concentration of energy- intensive engineering services and specialist equipment	Diagnostic and treatment services for physical healthcare, Consultant-led
Community and mental health hospital Learning disability unit	Inpatient Basic engineering services and equipment	Limited diagnostic and treatment services for physical healthcare Nurse- or GP-led, Care services for physical healthcare, Nurse- or GP-led, Mental health and learning disability services, Consultant- or nurse-led
Primary healthcare surgery	Non-inpatient Use typically 50–65 hours per week Basic engineering services and equipment	Primary care consultation GP-led
Health centre or clinic	Non-inpatient Use typically 35–45 hours per week Basic engineering services and equipment	Primary care and mental health Nurse, dental, visiting consultant or specialist

Care homes providing acute care

Care homes providing acute care would typically be assessed under 'Healthcare: Hospital: Acute and maternity hospital'. BREEAM Assessors carrying out assessments on these types of buildings will need to consider carefully all the BREEAM issues that might be affected by the need to provide special facilities for the building users. Where criteria in this scheme document are not explicit for this building type, the assessor will need to decide which criteria are appropriate and apply them accordingly, seeking confirmation from BRE Global on the application of alternative building criteria if necessary.

Appendix B – How BREEAM Fit Out works with other BREEAM schemes

BREEAM provides a suite of schemes that together assess environmental performance across different stages of a building's lifecycle. The four relevant schemes are:

- **BREEAM New Construction** – assessing the design and construction of new buildings
- **BREEAM Refurbishment** – assessing refurbishment and fit-out works across varying scopes from major refurbishment, upgrades to existing building fabric or services, to the first fit out of newly constructed buildings.
- **BREEAM Fit Out** – assessing tenant or occupier-led fit-out works within existing or newly constructed buildings.
- **BREEAM In-Use** – assessing assets in operation.

These schemes are designed to be complementary, allowing projects to be assessed at each stage of the asset lifecycle in line with the scope of works.

Building delivery scenarios

In shell only developments:

- The base building is assessed under BREEAM New Construction.
- The subsequent first fit out may be assessed against BREEAM Refurbishment using Parts 2, 3 and 4, dependant on the scope of works.
- Where separate tenant fit out is also being carried out, a BREEAM Fit Out assessment may also be used to cover these works.

In shell and core developments:

- The base building is assessed under BREEAM New Construction.
- Subsequent tenant fit-out works may then be assessed using either:
    - BREEAM Refurbishment, where the scope includes modifications to main building services or wider building elements, or
    - BREEAM Fit Out, where works are limited to tenant-controlled interior design and associated local services

In existing buildings undergoing major refurbishment:

- The demolition and refurbishment works are assessed under BREEAM Refurbishment.
- Where required, any subsequent occupier-led fit-out works can be assessed under BREEAM Fit Out, using either Level 1 or Level 2 fit-out depending on the scope.

Figure 3 illustrates how the Refurbishment V7 and Fit Out V7 schemes interact across typical delivery scenarios for the refurbishment and fit out of an existing building.

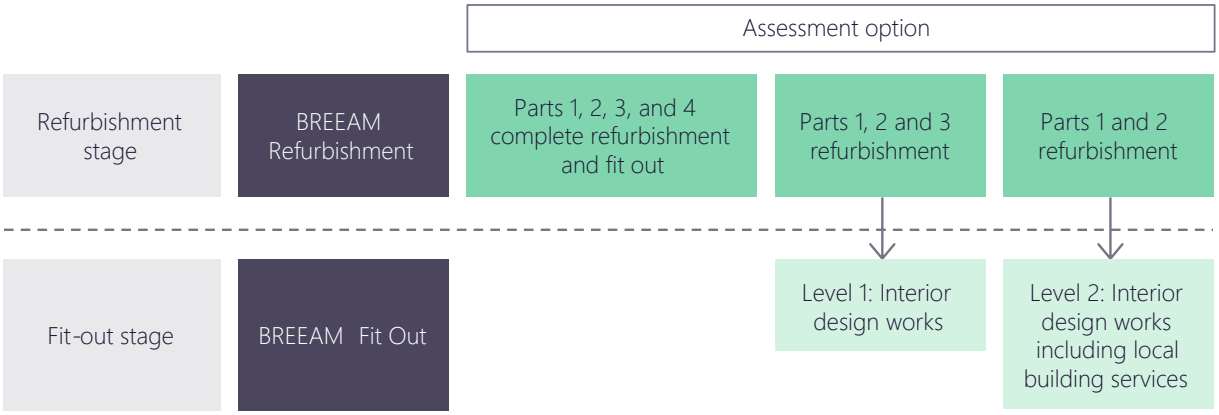


Figure 3: Example assessment options using BREEAM Refurbishment and BREEAM Fit Out on an existing building

Relationship between BREEAM New Construction, BREEAM Refurbishment Parts, and BREEAM Fit Out Levels

The scope of BREEAM New Construction (including Shell only and Shell and core options), BREEAM Refurbishment, and BREEAM Fit Out has been developed with reference to recognised industry definitions, such as the British Council for Offices Category A and B fit-out classifications where applicable. However, in practice, refurbishment and fit out works vary significantly between projects, and no single standard definition applies. This variability is addressed through the multi-part structure of BREEAM Refurbishment and the two levels of certification in BREEAM Fit Out, providing flexibility to tailor the assessment to the specific project scope.

Within **BREEAM Refurbishment**, the multi-part structure also reflects typical New Construction delivery alignments as set out below:

- **Part 1** aligns broadly with shell only.
- **Parts 1 and 2** aligns with shell and core.
- **Parts 1 to 4** aligns with fully fitted buildings.

The **BREEAM Fit Out** scheme broadly aligns with the BREEAM Refurbishment parts as set out below:

- **Level 1** aligns closely with the interior design scope of Part 4.
- **Level 2** aligns with Part 4 together with local services provisions typically associated with Part 3.

This alignment provides flexibility and continuity between schemes while enabling a more streamlined assessment route for fit-out projects, following the BREEAM Fit Out assessment scheme.

For further details of the scope of Levels 1 and 2, see Scope of BREEAM Fit Out.

Selecting the appropriate scheme

The appropriate scheme should be selected based on the extent of the works and the elements being modified or installed.

- Where works are limited to interior finishes and layout, BREEAM Fit Out Level 1 is appropriate.
- Where works include installation or modification of local building services within the tenant area, BREEAM Fit Out Level 2 may be appropriate.
- Where works extend beyond tenant-controlled areas or involve modifications to central building services or structure, BREEAM Refurbishment is the appropriate scheme.

Integration across the building lifecycle

The four schemes form a continuous framework:

- **New Construction** establishes the performance of the base building.
- **Refurbishment** addresses upgrades and major interventions.
- **Fit Out** ensures that tenant-led works maintain and enhance sustainability performance within the occupied space.
- **In-Use** assesses the operational performance of buildings during the occupation phase to ensure ongoing management, monitoring and improvement of sustainability performance.

Together, they enable a building to be assessed consistently across its lifecycle while reflecting the changing scope of works and responsibilities.

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