

Guide to  
**BREEAM**

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# Introduction

This independent guide provides property industry professionals, whether architects, consultants, contractors or clients, and those who fund developments, with an overview of the sometimes confusing BREEAM 2011 process. It explains the scoring system, reveals 'quick wins' and clarifies the standard of evidence needed, articulating the rationale for and cost of BREEAM along the way. In short, it focuses on the practical aspects of achieving a respectable rating rather than just promoting the benefits of green building.

Chapter 1 explains why BREEAM Assessments are on the increase, how they are structured and what types of building can be assessed. Although still not mandatory, decent ratings are increasingly being required by planning authorities, funding agencies or by clients who invest in corporate social responsibility. Knowing how to get the most out of BREEAM will obviously enhance the chances of winning work from these sources.

Chapter 2 explains the background to the Assessment process. What needs to be considered before starting? What evidence should be provided to the Assessor? Who does what, and when? In particular, the chapter explains the underlying principles of the scoring system, revealing how Categories are weighted, and the concepts of minimum standards and Innovation credits. Finally, and importantly, it shows when different Issues need to be considered to maximise the final score, and how works carried out by landlords and tenants can impact on the Assessment.

Chapter 3 is structured from the design team's point of view and focuses on those credits which might be considered easier to achieve – the so-called 'quick wins'. Organised Issue by Issue, the guidance identifies three key classes of quick win: smart site selection, design and specification; requiring contractors to adopt environmentally friendly methods; and strategic commissioning of specialist consultants. The information is laid out in a consistent format covering every aspect of the process – prerequisite conditions, lists of required evidence pre- and post-completion, building-type variations, and so on.

Chapter 4 deals with the Issues which are not covered in the previous chapter and which, for one reason or another, are more difficult to capitalise on. These reasons include design complexity or expense, specific building-type requirements, and the need to undertake unusual or specialised design activities or services. Again, the information here is laid out in the consistent and accessible format adopted in Chapter 3.

Finally, Chapter 5 looks at the cost of BREEAM. It explores the benefit of targeting good scores – especially the Excellent rating – and the comparative costs of different credits.

Note that this guide specifically addresses the BREEAM 2011 Scheme for newly constructed buildings. There are other schemes, all of which fall outside the scope of this guide. These include:

- BREEAM In-Use, used to assess and improve the environmental performance of existing commercial, industrial, retail and institutional buildings
- BREEAM Communities, used to assist planners and developers to improve, measure and independently certify the sustainability of development proposals at the planning stage
- BREEAM Domestic Refurbishment scheme, being developed for use in assessing the sustainable refurbishment of existing housing developments
- The Code for Sustainable Homes, used to assess new housing
- EcoHomes 2006, currently used to assess the refurbishment of homes in England and all housing developments in Scotland
- ECOHomesXB, used by housing landlords to assess and monitor the environmental performance of their existing housing stock.

# Background to BREEAM

## 1.1 Introduction

Over its 20 years of existence, the Building Research Establishment's Environment Assessment Method (BREEAM) has aimed to provide:

- a credible, independently assessed sustainability label for buildings
- recognition of a building's sustainability credentials
- a driver to stimulate demand for sustainable buildings
- assistance to clients and designers in mitigating life-cycle impacts of buildings.

The auditing process undertaken by independent Assessors certainly meets BREEAM's first ambition. BREEAM-rated buildings (from the 2008 Scheme onwards) are now listed on the *Green-BookLive* website<sup>1</sup> and, with the introduction of the annual BREEAM Awards, BREEAM has begun to make its mark as a vehicle for recognising sustainability credentials in buildings. The Building Research Establishment (BRE) has always promoted BREEAM as a driver for change, and the sustainability performance standards required to achieve BREEAM ratings have certainly risen over the years. Whether it has been solely responsible for stimulating the demand for more sustainable buildings over recent years is debatable, but certainly each successive launch of a BREEAM Scheme has driven up the standards of assessed buildings. BREEAM is increasingly used to audit levels of sustainability performance, both by those who commission buildings and those who regulate their construction. The need to undertake a BREEAM Assessment at the post-construction stage, introduced as part of the BREEAM 2008 Scheme, has extended the auditing process to cover more of the stages of a building's life cycle. The extended influence of BREEAM on the ongoing operation of buildings is a recent development and is yet to be fully quantified.

As with all audit systems, BREEAM is not perfect, but it does offer a verifiable and independent assessment of the sustainability performance of building design and construction. The requirement for a BREEAM Assessment at the post-construction stage, before the final BREEAM certificate can be issued, has overcome the problem of Assessments being carried out only at the design stage. Yet the requirements of any audit system are, to some extent, arbitrary and BREEAM is no exception. For example, contaminated sites that are treated score better than uncontaminated sites, which therefore do not require treatment, regardless of location. Such anomalies seem illogical to many clients.

The aim of this Guide is to provide those who commission, design and construct buildings with an overview of the 2011 version of the BREEAM UK New Construction Scheme (BREEAM 2011). BREEAM 2011 has responded to the changing context of legislation and new standards by:

- accommodating the revised methodology used to calculate compliance in the 2010 version of *Part L2A: Conservation of Fuel and Power in New Buildings other than Dwellings* of the Building Regulations. The requirement to achieve a 25 per cent aggregate reduction in carbon emissions meant that it was no longer possible to use a single benchmark scale based on an Energy Performance Certificate Carbon Index Rating. Continuing this approach might have resulted in some buildings which just comply with the Building Regulations scoring better in a BREEAM Assessment than buildings with lower carbon emissions
- aligning BREEAM's methodologies with the emerging raft of European construction sustainability standards which will operate at the framework, building and product levels. BS EN 15643: *Part 1 Sustainability of Construction Works – Sustainability Assessment of Buildings: General Framework* has already been published. It establishes a framework of principles, objectives and requirements for the sustainability assessment of buildings. More standards will be published throughout 2011 and 2012 to establish frameworks for the environmental, social and economic assessment of buildings, core rules for the environmental assessment of construction products and calculation methods for the environmental assessment of buildings
- aligning BREEAM with international standards such as the United Nations Environment Programme Sustainable Buildings and Climate Initiative's *Common Carbon Metric for Measuring Energy Use and Reporting Greenhouse Gas Emissions from Building Operations*
- satisfying the requirements of BRE's own recently launched *Code for Sustainable Environment*, which requires an integrated approach to design, management, evaluation and certification of environmental, social and economic impacts of buildings
- responding to industry feedback through BRE's own survey and the consultation undertaken by the UK Green Building Council to provide *market-focused but science-led* procedures.

BRE wants BREEAM to be the barometer of sustainable construction within the UK by measuring, evaluating and recording a building's performance during construction and operational life-cycle stages against best practice sustainability benchmarks. In addition to the current list of BREEAM-certified buildings, BRE intends to make data relating to metrics, such as carbon emissions, water consumption, waste generated and indoor air quality, available to the public in the future, which could prove very useful to designers and clients.

## 1.2 Why undertake a BREEAM Assessment?

There are a number of reasons for carrying out a BREEAM Assessment to audit the sustainability performance of a building. For example, it might:

- be a requirement of the client organisation, to help them to demonstrate that they are meeting their corporate social responsibility objectives
- be a prerequisite for receiving public or private development funding
- demonstrate an acceptable level of sustainability performance to regulatory approval bodies, such as planning authorities
- provide a marketable, sustainable asset.

The private sector property landlord and developer, British Land, is an example of a client organisation using BREEAM to assess and report on progress towards achieving its corporate social responsibility objectives.<sup>2</sup> British Land requires its major office developments to achieve a BREEAM Excellent rating and landlord areas of major retail developments to aim to achieve BREEAM Very Good.<sup>3</sup> Land Securities, another private sector client organisation, also requires its new major office and retail shopping centre developments to achieve BREEAM Very Good.<sup>4</sup> Similarly, the retailer Marks and Spencer set a target of BREEAM Excellent for the fitting out of their new stores and warehouses.<sup>5</sup>

Just as the Homes and Communities Agency requires housing to achieve a minimum *Code for Sustainable Homes* performance standard in order to receive public funding, in 2005 the then Department for Education and Skills made it a condition of any grant of capital funding that schools be designed and constructed to achieve a BREEAM Very Good rating. This applied to all new major school buildings and refurbishment of existing schools over a certain capital value.<sup>6</sup>

In 2007, a BRE study found that over 200 local authorities intended to use or were considering using BREEAM to set a sustainability performance standard of BREEAM Very Good for non-residential developments, within their Local Development Frameworks, core polices or supplementary planning documents.<sup>7</sup> Examples of this can be seen in:

- Manchester City Council's 'Guide to Development in Manchester – Supplementary Planning Document and Planning Guidance' which encourages developments to achieve BREEAM Very Good.<sup>8</sup>
- South Gloucestershire Council's 'Design Checklist Supplementary Planning Document', which requires developments to achieve BREEAM Very Good.<sup>9</sup>
- Ashford Borough Council's 'Local Development Framework Sustainable Design and Construction SPD', which requires all major developments to achieve various BREEAM ratings depending on location.<sup>10</sup>
- More recently, in 2010, the new Welsh Assembly Government's *Planning Policy Wales: Edition 3* (July 2010) required all non-residential planning applications for buildings over 1,000 m<sup>2</sup> or for sites of 1 hectare or more to achieve BREEAM Very Good standard, and the mandatory credits for Excellent in relation to the reduction of CO<sub>2</sub> emissions.<sup>11</sup>

While slow in coming, there is now growing evidence that sustainable buildings are already, and will increasingly become, more marketable than those which are not sustainable. A survey in 2007 showed that while 30 per cent of property investors and agents felt that sustainability issues affected property yields at that time, 60 per cent felt they would do so in the future. Subsequent research in 2008, by CB Richard Ellis, found that in Central London *energy efficiency* was an essential requirement for 58 per cent of tenants and *green attributes* an essential requirement for 50 per cent of tenants. More specifically, recent research into the London property market shows clear positive impacts relating to the use of BREEAM. It found that offices designed and constructed to meet the performance standards required for BREEAM Excellent are attracting a 22–27 per cent premium on their rents.<sup>12</sup>



### Deciding to carry out a BREEAM Assessment

On any project the client is ultimately responsible for deciding whether or not to undertake a BREEAM Assessment. As already described, there are a number of drivers that influence this decision. The earlier the decision is taken, the easier it will be to achieve the required standard without affecting either the client's aspirations or the design solution (as described in Chapter 2). Ideally, the decision should have been taken before any appraisal work begins (that is, before RIBA Stage A as indicated on Figure 1.1) and certainly before the client's brief is started. There will also be less impact on costs (as explained in Chapter 5).

### Appointing a BREEAM Assessor

Once the decision is made, the client will have to appoint an Assessor, qualified for the Scheme appropriate for the proposed building, and who works for a licensed organisation (whether as a sole trader or for a larger company). All Assessors are registered under the BRE Global Competent Persons Scheme and must have completed a training course (each Scheme requires separate training), passed the BREEAM examination and undertaken a test Assessment. Assessors are also audited by BRE to ensure they achieve a satisfactory standard. Details of all licensed organisations, their Assessors and the Schemes that they are qualified to undertake are available through BRE's *GreenBookLive* website.<sup>13</sup>

The Assessor should be appointed as early as possible, ideally before any appraisal work (RIBA Stage A as indicated on Figure 1.1) and never after the completion of the Design Brief (RIBA Stage B as indicated on Figure 1.1). This will allow the Assessor to advise the design team on what is required to achieve the required rating. It should be remembered, however, that the Assessor is there to audit information provided by the design team and client; it is not their job to generate the information.

### Appointing a BREEAM Accredited Professional (AP)

A BREEAM AP is a consultant with specialist skills in sustainability and environmental design and a high level of competence in the Assessment process. Their role goes beyond that of an Assessor by providing expert advice, on a more regular basis than an Assessor, on the Issues that need to be addressed to achieve a particular rating. Appointing a BREEAM AP is worth up to **three credits** in the Assessment, depending on when and for how long the BREEAM AP is appointed, as indicated on Figure 1.1 (see Chapter 2 for details). This service will involve an additional fee for the client. A list of BREEAM APs can also be found on BRE's *GreenBookLive* website.<sup>14</sup>

### The pre-assessment

This is the most important stage of the BREEAM process and should, ideally, be done before undertaking any feasibility work (as indicated on Figure 1.1) and certainly before the design brief is completed. The pre-assessment is carried out during a meeting in which the Assessor explains the process to the client and the design team. The client and the design team also agree a target rating with the Assessor. This meeting provides an opportunity to understand which BREEAM Issues and associated credits will have to be considered to achieve the target. The Assessor uses the BREEAM pre-assessment estimator tool to calculate the likely score and rating at the meeting. This stage is critical. It helps to identify the challenging performance requirements for the various Issues, allowing the design team to plan their design strategies accordingly. It also reveals which Issue credits simply cannot be achieved, allowing the design team and the Assessor to agree alternative Issue credits to be targeted to compensate for their loss.

The Assessor will issue minutes of this meeting, and usually a report, to the client and design team confirming the agreed rating and what evidence will be required to achieve the Issue credits targeted. This allows the client and the design team to programme the collation of the required evidence in time for the Assessor to complete the Assessment.

### **Registering the project**

This is a simple online process which the Assessor undertakes using the BREEAM extranet website for Assessors. The following information is required:

- details of the client and Assessor
- address of the proposed building
- the Scheme to be used for the Assessment
- whether the project is new build, refurbishment, part new build and part refurbishment or a fit-out of an existing building
- the number of buildings being assessed – this can be important when a single assessment is proposed to cover a number of similar buildings on a site
- the net floor area of the building
- a brief description of the building and its services.

In some Schemes it is possible to assess a number of separate but similar buildings or units on the same site to provide a single rating for the whole site. To do this, however, the buildings must fulfil the same function and be completed to a similar specification. Credits will be awarded based on the worst performing building on the site.

### **The design stage assessment**

Armed with the information that the client and design team agreed to provide at the pre-assessment meeting, the Assessor can then write the Design Stage Assessment Report. This is ideally completed just before construction starts on site or shortly afterwards. The Assessor audits the design intent in the design team's drawings, specifications and tender documentation. He or she also tests the client's commitment to meeting the requirements to achieve the criteria of the various Issues. Finally, he or she determines whether the evidence provided complies and awards the appropriate number of credits, thus determining the Interim BREEAM score. The Design Stage Assessment Report is usually issued to the client and design team as a draft in the first instance, typically including requests for missing information that is preventing the design from achieving a particular credit or credits. Once the client or the design team has provided the missing information, the Assessor can re-evaluate the Assessment and the final Design Stage Assessment Report will be completed. This will confirm the interim BREEAM score and rating, and will be submitted to BRE. Following quality assurance checks, BRE will issue the Interim BREEAM Certificate to the Assessor, who will pass it on to the client and the design team.

### **The post-construction stage assessment**

At the end of the construction phase, the Assessor must audit the evidence of the building's as-constructed condition against the performance standards achieved in the Design Stage Assessment Report and the requirements for post-construction evidence. This will involve the Assessor visiting the site and completing a site inspection report, with photographs, to verify that the required standards have been achieved, and meeting with the principal contractor, design

team and client to review the as-constructed information. This audit forms the basis of the Post-Construction Stage Assessment Report in which the Assessor will determine a final score and is carried out after practical completion.

It is possible to undertake a post-construction assessment without a Design Stage Assessment Report by simply auditing information provided at the post-construction stage against the criteria of all of the BREEAM Issues. This is an extremely bad idea and should not be contemplated unless unavoidable. It will be very difficult, however good the intentions, to achieve a high BREEAM rating because the award of certain credits requires activities or decisions, in relation to certain Issues, to be undertaken or made at the right time within the design process. These deadlines are unlikely to be met if an Assessment is left to this late stage in the process.

Occasionally, the as-constructed information supplied is inadequate and the Assessor is unable to award credits that had been provisionally awarded in the Design Stage Assessment Report. The Assessor will usually issue requests for any missing information in a draft Post-Construction Stage Assessment Report before finalising it. On receipt of any missing information, the Assessor will amend the Post-Construction Stage Assessment Report if appropriate, confirm the final score and rating and then submit it to BRE for quality assurance checks. BRE will then issue the final BREEAM Certificate to the Assessor, who passes it to the client and the design team.

## 1.4 The structure of a BREEAM Assessment

While BREEAM 2011 covers many different non-domestic building types, they are all assessed in essentially the same way. BREEAM 2011 consists of nine BREEAM *Categories* (plus an *Innovation Category*) divided into 48 *Issues*. The categories are:

- **Management**, which deals with sustainable procurement, responsible construction practices, construction site impacts, stakeholder participation (including consultation with relevant parties, accessible design, building user information and post-occupancy evaluation), life-cycle costing and service-life planning
- **Health and Wellbeing**, which deals with those aspects of a design that impact on the health or wellbeing of building occupants, including visual and thermal comfort, indoor air and water quality, acoustic performance, and providing low-risk, safe and secure access to and use of buildings
- **Energy**, which deals with the reduction of carbon emissions, including the use of energy-efficient building services, plant and equipment, low- or zero-carbon energy-generating technologies, and the ability to monitor energy use by sub-metering
- **Transport**, which deals with access to adjacent public transport networks and local amenities, along with the provision of information on travel options to building occupants, the provision of cyclist facilities and the limitation of car parking
- **Water**, which deals with opportunities for reducing water consumption through the use of efficient sanitary ware, the reuse and recycling of water, the provision of leak detection and prevention of leaks, monitoring controls and the provision of water-efficient equipment
- **Materials**, which considers the embodied life-cycle environmental impacts of materials, the use of responsibly sourced materials and the robustness of the building fabric
- **Waste**, which deals with reducing construction waste, the possible use of recycled

aggregates, the provision of space to encourage operational recycling and encouraging the specification of finishes by the building's occupants

- **Land Use and Ecology**, which considers the environmental impact of site selection including its ecological value and the protection of existing ecological features, mitigating the impact on and enhancing the ecological value of a site and limiting any long-term impacts on a site's biodiversity
- **Pollution**, which deals with the impacts of refrigerants and nitrous oxide emissions, the impacts of surface water run-off from a site and the impact of light and noise pollution on neighbours
- **Innovation** – the BREEAM 2008 Scheme introduced additional credits that could be awarded in recognition of achieving either exemplary levels of performance (above best practice performance currently recognised by BREEAM) in certain Issues or for incorporating innovative sustainability solutions within a building's design. This can help to boost a building's BREEAM performance (see Chapter 2 for a detailed explanation).

The Assessor has to consider whether the evidence provided by the client, design team and contractor demonstrates that a building's design and as-constructed condition complies with the performance criteria given for each of the Issues, in each of the above Categories in order to determine how many credits can be awarded in relation to each Issue. The Assessor will employ a number of proprietary assessment tools and calculators for use with BREEAM 2011 to do this.

BREEAM is structured to allow what BRE calls a 'balanced score card' approach to the assessment of a building's performance against Issues. This allows non-compliance in one Issue to be offset against another. Of course, certain Issues are so fundamental to achieving minimum performance standards that they cannot be offset in this way (see Chapter 2 for more detail).

Table 1.1 shows which Issues, and the number of credits available, could be applied to the different building types. This can vary between specific Assessments to reflect what facilities might be present with a particular building. It can be seen that each of the Categories, with the exception of one, has a similar number of Issues against which each project's performance will be assessed. The exception is the Energy Category, which contains nine Issues. This reflects the importance of energy consumption in buildings and the resultant carbon emissions.

Issues can have different values, measured in credits, ranging from one to, in one instance, 15. Of the 60 per cent of Issues in any Assessment that are awarded either one or two credits, around half are awarded one credit and the other half, two credits. A total of 19 per cent have between three and four credits, and another 17 per cent between five and six credits. Only two Issues can score more than six credits. One is in the Management Category, *Man01: Sustainable procurement*, which has eight credits available; the other is *Ene01: Reduction of CO<sub>2</sub> emissions*, in the Energy Category, where up to 15 credits are available.

Before the 2011 edition, each Scheme had its own separate manual containing specific assessment criteria relating to that building type. This meant that there were between 90 and 100 separate Issues (plus Innovation Issues) across all of the Schemes. BREEAM 2011 has consolidated these into a single BREEAM manual with just 48 Issues. This has been achieved partly by merging around 55 Issues from BREEAM 2008 into 17 Issues in the 2011 edition. Even so, the 2011 edition still includes different assessment criteria specific to the different building types. Some Issues only

TABLE 1.1: BREEAM 2011 – Categories and Issues, credits and schemes

	Commercial buildings		Non-housing buildings									
			Offices	Retail	Industrial	Educational (schools)	Educational (higher education)	Healthcare	Prisons	Courts	Multi-residential buildings	Other buildings
<b>Management Category</b>	12% weighting towards BREEAM score											
<i>Man01: Sustainable procurement</i>	8	8	8	8	8	8	8	8	8	8	8	8
<i>Man02: Responsible construction practices</i>	2	2	2	2	2	2	2	2	2	2	2	2
<i>Man03: Construction site impacts</i>	5	5	5	5	5	5	5	5	5	5	5	5
<i>Man04: Stakeholder participation</i>	4	4	4	4	4	4	4	4	4	4	4	4
<i>Man05: Life-cycle cost and service life planning</i>	3	3	3	3	3	3	3	3	3	3	3	3
Total credits available in Management Category	22	22	22	22	22	22	22	22	22	22	22	22
Weighted % score of 1 credit in Management Category	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
<b>Health and Wellbeing Category</b>	15% weighting towards BREEAM score											
<i>Hea01: Visual comfort</i>	3	4	3	3	4	5	3	3	3	3	3	3
<i>Hea02: Indoor air quality</i>	4	4	4	6	6	6	4	4	4	4	4	6
<i>Hea03: Thermal comfort</i>	2	2	2	2	2	2	2	2	2	2	2	2
<i>Hea04: Water quality</i>	1	1	1	1	1	1	1	1	1	1	1	1
<i>Hea05: Acoustic performance</i>	2	2	2	3	2	2	2	2	2	4	2	2
<i>Hea06: Safety and security</i>	2	2	2	2	2	2	2	2	2	2	2	2
Total credits available in Health and Wellbeing Category	14	15	14	17	17	18	14	14	14	16	16	16
Weighted % score of 1 credit in Health and Wellbeing Category	1.07	1.00	1.07	0.88	0.88	0.83	1.07	1.07	0.94	0.94	0.94	0.94
<b>Energy Category</b>	19% weighting towards BREEAM score											
<i>Ene01: Reduction of CO<sub>2</sub> emissions</i>	15	15	15	15	15	15	15	15	15	15	15	15
<i>Ene02: Energy monitoring</i>	2	2	2	2	2	2	1	1	1	1	2	2
<i>Ene03: External lighting</i>	1	1	1	1	1	1	1	1	1	1	1	1
<i>Ene04: Low- and zero-carbon technologies</i>	5	5	5	5	5	5	5	5	5	5	5	5
<i>Ene05: Energy-efficient cold storage</i>	0	2	2	0	2	2	0	0	0	0	2	2
<i>Ene06: Energy-efficient transportation systems</i>	2	2	2	2	2	2	2	2	2	2	2	2
<i>Ene07: Energy-efficient laboratory systems</i>	0	0	0	1	5	0	0	0	0	0	5	5
<i>Ene08: Energy-efficient equipment</i>	2	2	2	2	2	2	2	2	2	2	2	2
<i>Ene09: Drying space</i>	0	0	0	0	0	0	0	0	0	1	0	0
Total credits available in Energy Category	27	29	29	28	34	29	26	26	27	27	34	34
Weighted % score of 1 credit in Energy Category	0.70	0.66	0.66	0.68	0.56	0.66	0.73	0.73	0.70	0.70	0.56	0.56

Table 1.1 continued overleaf

TABLE 1.1 continued

	Commercial buildings		Non-housing buildings									
			Offices	Retail	Industrial	Educational (schools)	Educational (higher education)	Healthcare	Prisons	Counts	Multi-residential buildings	Other buildings
<b>Transport Category</b>												
8% weighting towards BREEAM score												
<i>Tra01: Public transport accessibility</i>	3	5	3	3	5	5	2	5	3	5		
<i>Tra02: Proximity to amenities</i>	1	1	1	1	1	1	0	1	2	1		
<i>Tra03: Cyclist facilities</i>	2	2	2	2	2	2	1	2	1	2		
<i>Tra04: Maximum car parking capacity</i>	2	0	2	0	2	1	0	0	2	2		
<i>Tra05: Travel plan</i>	1	1	1	1	1	1	1	1	1	1		
Total credits available in Transport Category	9	9	9	7	11	10	4	9	9	11		
Weighted % score of 1 credit in Transport Category	0.89	0.89	0.89	1.14	0.73	0.80	2.00	0.89	0.89	0.73		
<b>Water Category</b>												
6% weighting towards BREEAM score												
<i>Wat01: Water consumption</i>	5	5	5	5	5	5	5	5	5	5		
<i>Wat02: Water monitoring</i>	1	1	1	1	1	1	1	1	1	1		
<i>Wat03: Water leak detection and prevention</i>	2	2	2	2	2	2	2	2	2	2		
<i>Wat04: Water-efficient equipment</i>	1	1	1	1	1	1	1	1	1	1		
Total credits available in Water Category	9	9	9	9	9	9	9	9	9	9		
Weighted % score of 1 credit in Water Category	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67		
<b>Materials Category</b>												
12.5% weighting towards BREEAM score												
<i>Mat01: Life-cycle impacts</i>	5	5	2	6	6	6	4	6	6	6		
<i>Mat02: Hard landscaping and boundary protection</i>	1	1	1	1	1	1	1	1	1	1		
<i>Mat03: Responsible sourcing of materials</i>	3	3	3	3	3	3	3	3	3	3		
<i>Mat04: Insulation</i>	2	2	2	2	2	2	2	2	2	2		
<i>Mat05: Designing for robustness</i>	1	1	1	1	1	1	1	1	1	1		
Total credits available in Materials Category	12	12	9	13	13	13	11	13	13	13		
Weighted % score of 1 credit in Materials Category	1.04	1.04	1.39	0.96	0.96	0.96	1.14	0.96	0.96	0.96		
<b>Waste Category</b>												
7.5% weighting towards BREEAM score												
<i>Wst01: Construction waste management</i>	4	4	4	4	4	4	4	4	4	4		
<i>Wst02: Recycled aggregates</i>	1	1	1	1	1	1	1	1	1	1		
<i>Wst03: Operational waste</i>	1	1	1	1	1	1	1	1	1	1		
<i>Wst04: Speculative floor and ceiling finishes</i>	1	0	0	0	0	0	0	0	0	0		
Total credits available in Waste Category	7	6	6	6	6	6	6	6	6	6		
Weighted % score of 1 credit in Waste Category	1.07	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		

	Commercial buildings		Non-housing buildings									
			Offices	Retail	Industrial	Educational (schools)	Educational (higher education)	Healthcare	Prisons	Courts	Multi-residential buildings	Other buildings
<b>Land Use and Ecology Category</b>	10% weighting towards BREEAM score											
LE01: Site selection	2	2	2	2	2	2	2	2	2	2	2	2
LE02: Ecological value of site and protection of ecological features	1	1	1	1	1	1	1	1	1	1	1	1
LE03: Mitigating ecological impact	2	2	2	2	2	2	2	2	2	2	2	2
LE04: Enhancing site ecology	3	3	3	3	3	3	3	2	3	3	3	3
LE05: Long-term impact on biodiversity	2	2	2	2	2	2	2	3	2	2	2	2
Total credits available in Land Use and Ecology Category	10	10	10	10	10	10	10	10	10	10	10	10
Weighted % score of 1 credit in Land Use and Ecology Category	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
<b>Pollution Category</b>	10% weighting towards BREEAM score											
Pol01: Impact of refrigerants	3	3	3	3	3	3	3	3	3	3	3	3
Pol02: NO <sub>x</sub> emissions	3	3	2	3	3	3	3	3	3	3	3	3
Pol03: Surface water run-off	5	5	5	5	5	5	5	5	5	5	5	5
Pol04: Reduction of night time light pollution	1	1	1	1	1	1	1	1	1	1	1	1
Pol05: Noise attenuation	1	1	1	1	1	1	1	1	1	1	1	1
Total credits available in Pollution Category	13	13	12	13	13	13	13	13	13	13	13	13
Weighted % score of 1 credit in Pollution Category	0.77	0.77	0.83	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
<b>Innovation credits</b>												
Total credits available in Innovation Category	10	10	10	10	10	10	10	10	10	10	10	10
Weighted % score of 1 Innovation credit	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

apply to certain building types or buildings that contain certain functions or equipment, such as lifts or escalators. This reflects different functions, stakeholder and end-user requirements of the various building types covered. The hope is that this will make the process clearer, more flexible and more consistent, especially when assessing mixed-use buildings.

Once credits have been awarded for each Issue in a Category, they are totalled and given a weighting to establish a Category score expressed as a percentage. The Category scores are then totalled to calculate the final score. BRE believes that weighting each Category's score differently helps to define and rank the relative importance of each Category's environmental impact. The weightings used are the result of consultation with industry stakeholders combined with input from a panel of experts to gain a consensus. The weightings for each Category are shown in Table 1.1 (see Chapter 2 for further details on the impact of weighting on credits). An additional 1 per cent can also be added to the final percentage score for each Innovation Category credit awarded. However, the maximum number of Innovation Category credits that can be awarded in any Assessment is ten, so there is the potential to add up to 10 per cent to the final score. The procedure for awarding Innovation Category credits is detailed in Chapter 2.

Once the final score is calculated, a rating can be determined. The range of ratings that can be given and the scores required are:

- **Unclassified** for a score of less than 30 per cent
- **Pass** for a score that is equal to or more than 30 per cent, but less than 45 per cent
- **Good** for a score that is equal to or more than 45 per cent, but less than 55 per cent
- **Very Good** for a score that is equal to or more than 55 per cent, but less than 70 per cent
- **Excellent** for a score that is equal to or more than 70 per cent, but less than 85 per cent
- **Outstanding** for a score that is equal to or more than 85 per cent for exemplar buildings.

One of the significant changes introduced by BREEAM 2011 is the requirement for buildings that achieve either a BREEAM Excellent or Outstanding rating to undergo a BREEAM In-Use Assessment<sup>15</sup> to certify their ongoing performance. This Assessment must take place within three years of completion if the buildings are to maintain their rating. The theory is that this will encourage the continued high performance of the buildings achieving these ratings, even after they are occupied. BRE hopes this will provide evidence to clients and tenants of the business benefits of sustainable buildings. If an In-Use Assessment is not undertaken, or not certified, then the building's rating will be downgraded from Excellent and Outstanding to Very Good and Excellent respectively. This is published on the *GreenBookLive's* list of certified schemes and a new BREEAM Certificate will be issued to the client.

Exemplar buildings that achieve a BREEAM 2011 Outstanding rating will also be required to provide either a case study of the assessed building, or information to allow BRE Global to write one. The case study will then be published on the BREEAM and *GreenBookLive* websites. Clients will have to commit to providing this information in the Post-Construction Stage Assessment Report when it is submitted to BRE if an Outstanding rating is to be achieved. If the client fails to supply the information then the building's 2011 Outstanding rating will be downgraded to Excellent.

## 1.5 BREEAM Schemes

BREEAM 2011 sets out a way to assess the *environmental life-cycle impacts* of a range of newly constructed non-domestic building types within four key sectors:

- **commercial buildings** – offices (including offices with research and development areas), retail (such as individual shops, shopping centres, retail parks, restaurants) and industrial buildings (warehouses, process/manufacturing units and vehicle service buildings)
- **public (non-housing) buildings** – educational establishments (including pre-school, primary and secondary schools, sixth-form colleges, further education/vocational colleges and higher education institutions), healthcare buildings (such as hospitals, health centres/clinics, GP surgeries), prisons and courts
- **multi-residential buildings** – student halls of residence, sheltered accommodation, residential care homes, key worker accommodation and military barracks
- **other buildings** – other residential buildings (hotels, hostels, guest houses, secured training centres, etc., which cannot be assessed using the Code for Sustainable Homes), non-residential institutional buildings (including art galleries, museums, libraries, community centres, places of worship), assembly and leisure buildings (cinemas, theatres, concert halls, conference/exhibition halls, indoor/outdoor sports/fitness facilities) as well as any other building types, such as transport hubs, research and development facilities and crèches.

Further guidance on the types of healthcare, educational and multi-residential buildings covered by BREEAM 2011 is given in the appendices to the online *BREEAM Technical Manual*.<sup>16</sup> The buildings listed under the commercial buildings, public (non-housing) buildings and multi-residential sectors are classed as ‘standard type buildings’, which previously had their own BREEAM manuals. The Other Buildings sector covers what are classed as ‘non-standard building types’ that were previously covered by the Bespoke Scheme. They now fall under BREEAM 2011 and there is no longer a need for separately tailored assessment criteria. In mixed-use buildings that contain both standard type uses and non-standard uses, the building will be registered as a non-standard building type.

## 1.6 Schemes not covered in this Guide

As BREEAM Data Centres was only launched in 2010, BRE has decided that the 2010 version of the Scheme will remain in place for the time being and so falls outside the scope of this Guide. BRE has also developed tailored assessment criteria for specific uses, such as for visitor centres for the Forestry Commission and fire stations for the UK Fire Service, which are also outside the scope of this Guide.

Unlike previous Schemes, BREEAM 2011 only applies to new standalone buildings or new extensions to existing buildings in the UK. Refurbishment and fit-out projects will continue to be assessed with the appropriate 2008 Scheme while BRE develop a new Refurbishment Scheme, which they intend to launch in 2012.

It might be possible, however, to assess major refurbishment projects using BREEAM 2011 if agreed with BRE. BRE defines 'major refurbishment projects' as projects where a building's envelope and structure are fundamentally remodelled or adapted and new services (such as lighting, heating, ventilation and cooling) are provided. It is expected that most of a building's sub- and superstructure will be reused in a major refurbishment project, in addition to the retention and renovation of the façade. If only individual elements of a building's envelope, structure or services are being remodelled or replaced, BRE will not class the work as a major refurbishment project. It is important to obtain advice from an Assessor as early as possible regarding the most appropriate Scheme. If there is any doubt, the Assessor can clarify the position with BRE. As BREEAM 2011 only applies to new buildings within the UK, BRE has developed a number of BREEAM Schemes that can be used in other countries. These include:

- **BREEAM Europe commercial**, which has been developed to recognise different construction standards and practices in the European region. It covers office, retail and industrial buildings
- **BREEAM Gulf**, which was launched in 2009 to deal specifically with environmental issues of the Gulf region
- **BREEAM International Bespoke**, which can be used for either single or multi-building schemes anywhere in the world.

Further details of these Schemes can be found on the BREEAM website.<sup>17</sup> The Netherlands<sup>18</sup> and Spain<sup>19</sup> have also chosen to base their sustainable building assessments on the BREEAM methodology. BREEAM schemes are also being developed for use in Norway and Sweden. These schemes are all beyond the scope of this Guide.

## 1.7 Other rating systems

BRE has to compete in the international market with a range of other sustainability audit systems. BREEAM's principal international competitor is the United States Green Building Council's *Leadership in Energy and Environmental Design* (LEED) green building certification scheme which was launched in 1998.<sup>20</sup> Although it originates in the USA, it is used by a number of international corporations across the world, including some in the UK. It has separate rating systems for new construction (including major renovations), the operation and maintenance of existing buildings, commercial interior fit-out works, schools, retail, health care, homes and 'neighbourhood development'.

One of the key differences between LEED and BREEAM is the method of assessment. BREEAM uses licensed Assessors to audit the evidence provided by the client and design team in order to determine compliance. The Assessors submit their Assessment to BRE, which issues the BREEAM Certificate. Evidence for LEED assessments is normally collated by the design team, although a LEED Accredited Professional can be used to assist in this task, and then submitted to the US Green Building Council which assesses it before issuing the LEED Certificate. While certain industry critics praise LEED for its greater transparency, claiming that it promotes innovation, others feel that BREEAM offers both a better scientific basis and a broader remit because it covers the social aspects of sustainability. There has also been some criticism of LEED's consensus-based approach, which some say is overly responsive to manufacturers' needs.<sup>21</sup>

The Australian Green Building Council operates the Green Star rating scheme<sup>22</sup> for evaluation of the environmental design and construction of building in Australia. This has been in operation for approximately six years and has been adopted for use in New Zealand and South Africa.

A number of other environmental rating schemes have been launched around the world, providing country-specific assessment procedures such as:

- Green Building Index – Malaysian Green Building Council<sup>23</sup>
- Green Mark – Singapore’s Building and Construction Authority<sup>24</sup>
- Estidama – Abu Dhabi Urban Planning Council<sup>25</sup>
- Comprehensive Assessment System for Built Environment Efficiency (CASBEE) – Japan<sup>26</sup>
- Sustainable Building Certificate – German Sustainable Building Council.<sup>27</sup>

None of these rating schemes is covered in this Guide.

## References

- 1 Web link to *GreenBookLive* – BREEAM Certified Buildings – 2008 Onwards:  
[www.greenbooklive.com/search/scheme.jsp?id=202](http://www.greenbooklive.com/search/scheme.jsp?id=202)
- 2 For British Land update for ‘Winter 2010’ see:  
[www.britishland.com/index.asp?pageid=501](http://www.britishland.com/index.asp?pageid=501)
- 3 For British Land social corporate responsibility policies for 2010/2011 see:  
[www.britishland.com/index.asp?pageid=501](http://www.britishland.com/index.asp?pageid=501)
- 4 For Land Securities ‘Environmental policy, objectives and targets’ see:  
[www.landsecurities.com/responsibility/sustainability/environmental-policy-objectives-targets](http://www.landsecurities.com/responsibility/sustainability/environmental-policy-objectives-targets)
- 5 Marks and Spencer ‘How We Do Business Report: 2010’ see:  
[http://corporate.marksandspencer.com/documents/publications/2010/How\\_We\\_Do\\_Business\\_Report\\_2010](http://corporate.marksandspencer.com/documents/publications/2010/How_We_Do_Business_Report_2010)
- 6 See: <http://tna.europarchive.org/20081022170523/http://www.teachernet.gov.uk/management/resources/financeandbuilding/schoolbuildings/sustainability/breem/>
- 7 Josephine Prior and Claire Williams (2008) *Sustainability Through Planning: Local Authority Use of BREEAM, EcoHomes and the Code for Sustainable Homes*, HIS BRE Press, Watford, UK.
- 8 Manchester City Council, ‘Environmental Design: Clause 4.7’ in *Guide to Development in Manchester – Supplementary Planning Document and Planning Guidance*, see:  
[www.manchester.gov.uk/site/scripts/download\\_info.php?downloadID=644&fileID=1424](http://www.manchester.gov.uk/site/scripts/download_info.php?downloadID=644&fileID=1424)
- 9 South Gloucestershire Council, *Design Checklist Supplementary Planning Document: Part 3*, page 10 see:  
[www.southglos.gov.uk/NR/rdonlyres/E26D9144-C40F-45ED-ACA3-1F2812C925DA/0/PTE070520.pdf](http://www.southglos.gov.uk/NR/rdonlyres/E26D9144-C40F-45ED-ACA3-1F2812C925DA/0/PTE070520.pdf)
- 10 Ashford Borough Council; Local Development Framework; Sustainable Design and Construction SPD (2009), available at: [www.ashford.gov.uk/pdf/SustainableDesign&ConstructionSPD.pdf](http://www.ashford.gov.uk/pdf/SustainableDesign&ConstructionSPD.pdf)
- 11 See Policy 4.11.4, Chapter 4 in *Planning for Sustainability of the Planning Policy Wales*, 3<sup>rd</sup> edition (July 2010) at:  
<http://wales.gov.uk/docs/desh/publications/100720planningppwchapter4en.pdf>
- 12 Andrea Chegut, Piet Eichholtz and Nils Kok (Maastricht University) (July 2011) *The Value of Green Buildings: New Evidence from the United Kingdom*. Available at: [www.sirp.se/l/getfile.ashx?cid=280784&cc=3&refid=34](http://www.sirp.se/l/getfile.ashx?cid=280784&cc=3&refid=34)
- 13 For details of BREEAM licensed organisations and Assessors, see:  
[www.greenbooklive.com/search/scheme.jsp?id=214](http://www.greenbooklive.com/search/scheme.jsp?id=214)
- 14 For a list of APs, see: [www.greenbooklive.com/search/scheme.jsp?id=172](http://www.greenbooklive.com/search/scheme.jsp?id=172)
- 15 For details of the BREEAM In-Use Scheme, see: [www.breem.org/page.jsp?id=373](http://www.breem.org/page.jsp?id=373)
- 16 To view the BREEAM online Technical Manual, go to: [www.breem.org/podpage.jsp?id=414](http://www.breem.org/podpage.jsp?id=414)

- 17 For BREEAM International Schemes, see: [www.breeam.org/podpage.jsp?id=54](http://www.breeam.org/podpage.jsp?id=54)
- 18 See Dutch Green Building Council for details of BREEAM – NL, at: [www.dgbc.nl/wat\\_is\\_dgbc/dgbc\\_english](http://www.dgbc.nl/wat_is_dgbc/dgbc_english)
- 19 News article: 'BRE Global and ITG sign letter of intent for BREEAM in Spain', see: [www.breeam.org/newsdetails.jsp?id=574](http://www.breeam.org/newsdetails.jsp?id=574)
- 20 For LEED scheme website see: [www.usgbc.org/DisplayPage.aspx?CMSPageID=222](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222)
- 21 Inbuilt Ltd, 'BREEAM versus LEED: White Paper' (2010), available from: [www.inbuilt.co.uk/media/406565/breemvsleed.pdf](http://www.inbuilt.co.uk/media/406565/breemvsleed.pdf)
- 22 For Australian Green Building Council's Green Star Rating scheme, see: [www.gbca.org.au/green-star/](http://www.gbca.org.au/green-star/)
- 23 For Malaysian's Green Building Council's Green Mark scheme, see: [www.greenbuildingindex.org/index.html](http://www.greenbuildingindex.org/index.html)
- 24 For Green Mark scheme by the Building and Construction Authority in Singapore, see: [www.bca.gov.sg/greenmark/green\\_mark\\_buildings.html](http://www.bca.gov.sg/greenmark/green_mark_buildings.html)
- 25 For Abu Dhabi Urban Planning Council's Estidama, see: [www.estidama.org/](http://www.estidama.org/)
- 26 For Japan's 'Comprehensive Assessment System for Built Environment Efficiency', see: [www.ibec.or.jp/CASBEE/english/index.htm](http://www.ibec.or.jp/CASBEE/english/index.htm)
- 27 For Germany's Sustainable Building Council's 'Sustainable Building Certificate', see: [www.dgnb.de/\\_en/certification-system/DGNB\\_Certificate/DGNB\\_Certificate.php](http://www.dgnb.de/_en/certification-system/DGNB_Certificate/DGNB_Certificate.php)