



NBS and BREEAM

NBS Building, Landscape and Engineering have been updated significantly during Updates 2009-3 and 2010-1 and now include extensive guidance on the BRE Environmental Assessment Method (BREEAM); in particular, how the use of certain products and particular systems or issues connected with the management of the project can influence the award of credits.

Whilst BREEAM is by no means the only environmental assessment method available –Leadership in Energy and Environment Design (LEED) from the US, and Green Star from Australia being two other well known – it is the most widely used within the UK. The introduction of BREEAM International for assessment of buildings in Europe and the Gulf, and BREEAM Bespoke International for assessment of buildings outside the UK and outside the scope of BREEAM International schemes, mean it is becoming increasingly popular worldwide. BREEAM can be used on a variety of ‘standard’ building types, including:

- Education/ higher education
- Retail
- Offices
- Healthcare
- Industrial
- Courts
- Prisons
- Multi residential.

A freely available assessor manual relating to each of the above mentioned building types is available on the BREEAM website.

Further BREEAM schemes are available which can be used on other building types not covered by the ‘standard’ BREEAM schemes, although, perhaps because of the nature of these types of buildings, assessor manuals are not publicly available. Similarly, at the time of writing, assessor manuals relating to non UK buildings, i.e. BREEAM Gulf and Bespoke International, are not publicly available.

Each BREEAM scheme covers ten categories of sustainability including:

- Management
- Health and wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution
- Innovation

Within each of the ten categories there are a number of issues which define performance targets and assessment criteria, each aimed at mitigating the impact of a new or refurbished building on the environment. When the targets and assessment criteria are met, credits can be awarded.

The overall BREEAM rating for any particular scheme type not only requires a minimum number of credits to be achieved but also requires that certain mandatory issues achieve the award of a credit. For example, under the Management category, issue Man 1 - Commissioning, a credit award must be achieved to enable a PASS or higher rating to be given, whilst under the Energy category, a credit must be achieved relating to issue Ene 5 - Low or zero carbon technologies, in order to enable an EXCELLENT or OUTSTANDING rating to be given. Early involvement of a BREEAM Assessor offers the best opportunity of gaining the highest possible rating whilst the use of a BREEAM Accredited Professional (BREEAM AP) in itself gains additional credits.

The NBS approach

Extensive research was carried out with our customers to find out what changes to NBS content in relation to BREEAM would be useful. A number of themes came out of this research, specifically:

- Notes in the clause and general guidance relating to specific BREEAM issues
- Extending clause content to allow specification of materials containing recycled material, e.g. for plasterboard, insulation
- For performance specifications, include means of specifying minimum Green Guide ratings, e.g. for floor finishes, external walls, internal walls, windows, hard landscape and boundary protection.

Using the eight BREEAM Assessor Manuals, issues within each category were aligned to the RIBA Plan of Work stage at which point decisions must be considered in order to address the performance targets and assessment criteria. Specifiers must be aware that early consideration of BREEAM issues is essential to maximize the potential award of credits, which in turn determines the overall scheme rating.

Having identified the RIBA Plan of Work stage, each issue within the BREEAM categories (excluding Innovation) was aligned to the relevant NBS section, i.e. from where a specifier would be able to influence the selection of an individual product, or complete system. Whilst in some instances aligning issues to sections is relatively straightforward, there are a significant number of issues which have not been addressed, examples of these together with the reasoning are summarized below:

- Several issues fall outside the scope of NBS (e.g. the selection of the site, which influences the award of the credit dealing with reuse of land (LE 1) and whether or not the building is at risk of flooding (POL 5).
- Issues related to an aspect of design (rather than specification) including the provision of (or the deliberate omission of) a facility, e.g. recyclable waste storage (Wst 3), outdoor space (Hea 15), or maximum car parking capacity (Tra 6).
- A number of products and systems not currently dealt with in NBS (e.g. compactor/ baler products (Wst 4) and vehicle wash systems (Wat 7)
- Issues related to the specification of a selection of products, which when combined form a complete building element, e.g. materials specification - major building elements (Mat 1) which deals with Green Guide ratings for upper floor slabs, external and internal walls. Currently many of the materials which may be used in combination to form major building elements are specified from multiple work sections

- Issues related to the specification of common products which may be used for various functions, but are currently selected from various work sections dependant upon the purpose for use, e.g. insulation (Mat 6).

NBS Guidance

- Generally, the approach we have taken is that where BREEAM issues call for the use of a single product, guidance is adjacent to the particular clause, e.g. recycled aggregate (Wst 2) is specified in work section E10, clause 310
- Where a BREEAM issue allows a choice in product selection, we have added general guidance and cross referred to it from individual clauses, e.g. work section Q24 clauses 110, 112, 113, etc
- Numerous BREEAM issues include detailed compliance criteria which require specification of products or methods of execution which are dealt with in separate clauses within a work section, or in clauses in more than one work section. Our approach here is to include general guidance and/ or clause guidance to suit each of the compliance criteria, e.g. sub metering of substantial energy uses (Ene 2) requires the use of meters to record the consumption of energy used by space heating, domestic hot water, humidification, cooling and fans (major). In this instance, meters may have to specified in one or more work sections, dependant upon the source of fuel used, and in some case the layout of plant and equipment, e.g. if only electricity is used as a fuel, then a meter can be specified in work section V31. However, as the majority of buildings use a mix of fuels, it may be necessary to specify a gas meter using work section S40. In a building which is multi tenanted, or where units are fed from a common boiler plant, it may be necessary to specify a heat meter using work section Y11.

The following series of tables show each of the BREEAM issues, the RIBA Plan of Work stage at which consideration must be given to maximize the potential of achieving credits for the issue, and details of the NBS sections from which specifiers may wish to consider selecting products, systems, details of execution, etc. It is important to note that, as explained above, not every BREEAM issue is dealt with by NBS specification products, and some are only covered in part. So, specifiers must refer to the relevant BREEAM Assessor Manual

Tables

	RIBA Plan of Work stage	NBS Section
MANAGEMENT		
Man 1 Commissioning	A/B	Preliminaries section A30.
Man 2 Considerate constructors	B/G	Preliminaries section A32.
Man 3 Construction site impacts	B/G	Preliminaries section A30.
Man 4 Building user guide	B/G	Preliminaries section A37.
Man 5 Site investigation (BREEAM Education only)	B/C	C10; C11.
Man 6 Consultation	A/B	Award of credits related to this issue is influenced by the involvement of relevant stakeholders in the design process. Not directly influenced by NBS.
Man 7 Shared facilities	A/B	Award of credits related to this issue is influenced by consultation with potential users of the shared facilities during the design process. Not directly influenced by NBS.
Man 8 Security	B/C	Award of credits related to this issue is influenced by consultation with, and implementation of, recommendations made by a Crime Prevention Design Advisor or equivalent. Not directly influenced by NBS.
Man 9 Publication of building information (BREEAM Education only)	B/K	Award of credits related to this issue are determined by publication of a case study. Not directly influenced by NBS.
Man 10 Development as a learning resource (BREEAM Education only)	B/C	Award of credits related to this issue are determined by the provision of features which demonstrate to the building users how the building and/ or landscape has been developed to mitigate the effect it has on the environment. Not directly influenced by NBS.
Man 11 Ease of maintenance	A/D	Award of credits related to this issue are determined by addressing a number of requirements including: those set out in Appendix 2 A1 of CIBSE Guide M - Maintenance engineering and management; completing a critical appraisal in accordance with BS ISO 15686-1 at RIBA Work Stage A; developing a maintenance strategy during the design stage. Further requirements apply which are specific to Education and Healthcare. Not directly influenced by NBS.
Man 12 Life cycle costing	A/F	Award of credits related to this issue are determined by addressing a number of requirements including carrying out a life cycle cost analysis during RIBA Work Stage C/D with further updated during RIBA Stage D/E. Not directly influenced by NBS.
Man 13 Good corporate citizen (BREEAM Healthcare only)	B/C	Award of this credit relates to carrying out a consultation process involving the design team, client/ senior management and staff representatives during RIBA Work Stage K using the Good Corporate Citizen model, New Buildings section and to commit committing to, or achieving a minimum average score. In addition, there is a requirement for ongoing annual review. Not directly influenced by NBS.

	RIBA Plan of Work stage	NBS Section
HEALTH AND WELLBEING		
Hea 1 Daylighting	B/E	Work sections H10; H11; H13; L10.
Hea 2 View out	B/C	Work sections H10; H11; H13; L10.
Hea 3 Glare control	B/D	Work sections H10; H11; H13; L10; N10.
Hea 4 High frequency lighting	B/D	Work section V59.
Hea 5 Internal and external lighting levels	B/E	Work sections V50; V60.
Hea 6 Lighting zones	B/D	Work section V50.
Hea 7 Potential for natural ventilation	B/E	Work sections H10; H11; H13; L10; P21; U10.
Hea 8 Indoor air quality	B/E	Work sections L10; U10.
Hea 9 Volatile organic compounds	B/E	Work sections K11, K21, K40, K45, M42, M50, M52, M60.
Hea 10 Thermal comfort	B/E	Work sections T10, U10.
Hea 11 Thermal zoning	B/D	Work section Y40.
Hea 12 Microbial contamination	B/C	Work sections S10; S14; S90; T60; U30, U81, U86.
Hea 13 Acoustic performance	B/E	Work sections B11, B13, B14, B15, E10, E60, F10, F30, G10, G30, H10, H11, H13, H20, H30, H31, H40, H41, H42, H43, H67, H90, H92, K10, K11, K13, K30, K40, K41, K45, K46, L10, L20, M12, M51, P10, P12, Z22
Hea 14 Office space	B/D	Award of credits for this issue is dependant upon compliance with three or more of other issues in HEA category, i.e. HEA 1, 2, 3, 6, 7, 11, and 13. Not directly influenced within NBS.
Hea 15 Outdoor space	A/B	Award of this credit is not covered specifically by one NBS work section as the credit is awarded on basis of provision of outdoor space of 'adequate size'. The design and layout of the outdoor amenity area must include seating, be accessible from the assessed building, and located in a private area, away from any potential sources of noise.
Hea 16 Drinking water	B/D	Work sections S10; S90.
Hea 17 Specification of laboratory fume cupboards	B/C	Work sections U21; U87; U88.
Hea 18 Containment level 2 and 3 laboratory areas	B/C	n/a
Hea 19 Arts in health (BREEAM Healthcare only)	A/B	Award of this credit relates to the appointment of staff, or the implementation of an art policy/ strategy. Not directly influenced within NBS.
Hea 20 Home Office		Award of this credit relates to the relate to provision of facilities including sockets, telephone points, ventilation, window etc.
Hea 21 Sound Insulation		Award of credits relates to the use of insulation more effective than that required by Building Regulations (England and Wales), Approved Document E (2003 + 2004 amendment). The greater the effectiveness of insulation provided, the greater number of credits awarded. Not currently included within NBS.

	RIBA Plan of Work stage	NBS Section
ENERGY		
Ene 1 Reduction of CO ₂ emissions	B/C	Award of credits is determined by comparing the building's CO ₂ index (EPC Rating), taken from the Energy Performance Certificate (EPC), with a table of benchmarks included in the BREEAM Assessor Manual for that particular building type. As the energy use and carbon dioxide emissions of a building is affected by building geometry, construction, use and HVAC and lighting equipment, this issue is not directly influenced by NBS.
Ene 2 Sub-metering of substantial energy uses	B/C	Work sections S40; V31; Y11.
Ene 3 Sub-metering of high energy load and tenancy areas	B/C	Work sections V31; Y11.
Ene 4 External lighting	B/D	V51; V59; V60.
Ene 5 Low or zero carbon technologies	B/C	Work sections T24; T25; T26; T40; V13; V14.
Ene 6 Building fabric performance and avoidance of air infiltration	B/D	Preliminaries section A33; work sections L10; T30.
Ene 7 Cold storage	B/E	Work section T71.
Ene 8 Lifts	B/E	Work sections X10; X12.
Ene 9 Escalators and travelling walkways	B/E	Work section X15.
Ene 10 Free cooling	B/C	Work sections T10, U10.
Ene 11 Energy efficient fume cupboards	B/C	Work section U21.
Ene 12 Swimming pool ventilation and heat loss	B/E	Work section Y40.
Ene 13 Labelled lighting controls	B/E	Work sections V50; V80.
Ene 14 BMS	B/C	Work section Y40.
Ene 15 Provision of energy efficient equipment	B/E	Not generally specified by designers.
Ene 16 CHP community energy schemes	B/C	Work section T25.
Ene 17 Residential Areas: Energy Consumption	B/C	Not yet covered within NBS.
Ene 18 Drying Space	B	Award of this credit is dependant on provision of a drying space for each self contained dwelling and individual bedroom. Not directly influenced by NBS.
Ene 19 Energy Efficient Laboratories	B/C	Work sections U21.

	RIBA Plan of Work stage	NBS Section
TRANSPORT		
Tra 1 Provision of public transport	A/B	Transport provision not influenced by NBS.
Tra 2 Proximity to amenities	A/B	Location of development and proximity to amenities not influenced by NBS.
Tra 3 Cyclists facilities	B/C	Work sections N10; Q50.
Tra 4 Pedestrian and cyclist safety	B/C	Award of this credit is dependant on meeting specific design criteria relating to the provision of cycle lanes, footpaths, access roads and signage. Whilst the specification for materials used in the construction of these facilities may be made via a number of work sections, the design criteria is not directly influenced by NBS.
Tra 5 Travel plan	A/B	Not influenced by NBS.
Tra 6 Maximum car parking capacity	B/C	Award of this credit is dependant on meeting specific design criteria relating to the provision of car parking spaces. Whilst the specification for materials used in the construction of these facilities may be made via a number of work sections, the design criteria is not directly influenced by NBS.
Tra 7 Travel information point	B/F	Work section N91.
Tra 8 Deliveries and manoeuvring	B/C	Award of this credit is based on suitable space being provided to allow for, e.g. parking areas for delivery vehicles, turning circles, dedicated areas for storage and skips. Not directly influenced by NBS specification.

	RIBA Plan of Work stage	NBS Section
WATER		
Wat 1 Water consumption	B/C	Work sections N13; S10; S90.
Wat 2 Water meter	B/C	Work sections S10; S90; W58.
Wat 3 Major leak detection	C/D	Work sections S10; S90; W58.
Wat 4 Sanitary supply shut off	B/D	Work sections S10; S90; W58.
Wat 5 Water recycling	B/C	Work sections R10; S17; Y21.
Wat 6 Irrigation systems	B/C	Work section S14.
Wat 7 Vehicle wash	B/C	Vehicle wash systems are not currently included within NBS Building or NBS Engineering.

	RIBA Plan of Work stage	NBS Section
MATERIALS		
Mat 1 Materials specification – Major building elements	B/E	Floor Finishes / Coverings: Work sections K21; M11; M12; M40; M41; M42; M50; M51. Windows: Work sections H10; H11; H13; L10. Roof - not yet covered within NBS; External Walls - not yet covered within NBS; Upper Floor Slabs - not yet covered within NBS; Internal Walls - not yet covered within NBS.
Mat 2 Hard landscaping and boundary protection	B/E	Work sections D41; F10; F20; F21; F22; Q21; Q22; Q23; Q24; Q25; Q40; Q55.
Mat 3 Reuse of building facade	A/B	Reuse of building façade not influenced by NBS.
Mat 4 Reuse of building structure	A/B	Reuse of building structure not influenced by NBS.
Mat 5 Responsible sourcing of materials	B/E	Not yet covered within NBS.
Mat 6 Insulation	B/E	Not yet covered within NBS.
Mat 7 Designing for robustness	B/E	Not yet covered within NBS.
Mat 8 Responsible sourcing of materials: Finishing elements	B/K	Not yet covered within NBS.

	RIBA Plan of Work stage	NBS Section
WASTE		
Wst 1 Construction site waste management	B/C	Preliminaries section A30.
Wst 2 Recycled aggregates	B/C	Work section E10.
Wst 3 Recyclable waste storage	B/C	Award of credits is based on the provision of suitably sized and located storage spaces for recycled materials generated during building use. Not directly influenced by NBS specification.
Wst 4 Compactor/ Baler	B/C	Award of this credit is dependant upon provision of a Compactor/ Baler, not currently included within NBS Building or NBS Engineering. A further requirement relates to the location and size of space to accommodate the compactor/ baler. The final requirement relates to the provision of a water outlet which may be specified in work section S10.
Wst 5 Composting	B/C	Award of this credit is dependant upon provision of a vessel being installed on site for composting suitable food waste. Not directly influenced by NBS. A further requirement relates to the location and size of space to accommodate the vessel and storage of waste/ compost. The final requirement relates to the provision of a water outlet which may be specified in work section S10.
Wst 6 Floor finishes	B/E	Work sections K21; M12; M40; M41; M42; M50; M51.

	RIBA Plan of Work stage	NBS Section
LAND USE AND ECOLOGY		
LE1 Re-use of land	A/B	Reuse of land not influenced by NBS.
LE2 Contaminated land	A/B	Work section C11.
LE3 Ecological value of land and protection of ecological features	B/J	Preliminaries section A34; work section C10.
LE4 Mitigating ecological impact	A/B	Award of this credit is dependant upon calculating the change in ecological value by comparing the diversity (number and area) of plant species on the site pre and post construction. Not directly influenced by NBS specification.
LE5 Enhancing site ecology	B/C	The scope of the ecological survey and qualification requirements of the surveyor (i.e. suitable qualified ecologist) to achieve first credit may be specified in section C10. The second credit is awarded subject to the recommendations of the suitably qualified ecologists report being implemented - not directly influenced by NBS specification
LE6 Long term impact on biodiversity	B/C	Award of this credit is dependant upon the appointment of a suitably qualified ecologist to confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the design and construction process. It is also necessary to implement a five year landscape and habitat management plan. Additional criteria, when met, leads to the award of further credits. Predominately, these relate to the contractor implementing management activities on site, training the site workforce and record keeping; each aimed at protecting ecology and biodiversity. Not directly influenced by NBS specification.
LE7 Consultation with students and staff (BREEAM Education only)	A/B	Award of this credit is dependant upon consultation with staff and pupils throughout the design process. Not directly influenced by NBS specification.
LE8 Local wildlife partnerships	B/C	Award of this credit is dependant upon creating a partnership between the design team and local wildlife groups to seek their local knowledge and expertise whilst also encouraging ongoing support. Not directly influenced by NBS specification.

	RIBA Plan of Work stage	NBS Section
POLLUTION		
Pol 1 Refrigerant GWP – building services	B/D	Work sections T40; T60; U60.
Pol 2 Preventing refrigerant leaks	B/D	Work sections T40; T41; T60; T71; U60.
Pol 3 Refrigerant GWP Cold storage	B/D	Work section T71.
Pol 4 NOx emissions of heating source	B/D	Work sections T20; T23; T24.
Pol 5 Flood risk	B/E	<p>Award of credits is dependant upon satisfying multiple criteria including:</p> <ul style="list-style-type: none"> • The location of the site and degree of probability of it flooding based on a flood risk assessment. • Setting the ground level of the building above the design flood level of the flood zone by a minimum of 600 mm. • Providing attenuation in the form of SUDS. <p>The various items of work or products which may be used to form SUDS can be specified in NBS, e.g. permeable paving systems in work section Q24, formation of levels, backfilling of sub soil, compaction of clay liners used to form ponds in work section D20, marginal planting and reed beds in work section Q31, and green roofs in work section Q37.</p>
Pol 6 Minimising watercourse pollution	B/C	<p>Award of credits is dependant upon satisfying multiple criteria including:</p> <ul style="list-style-type: none"> • Provision of SUDS which can be specified in NBS, e.g. permeable paving systems in work section Q24, formation of levels, backfilling of sub soil, compaction of clay liners used to form ponds in work section D20, marginal planting and reed beds in work section Q31, and green roofs in work section Q37. • Use of oil/ petrol separators in surface water drainage systems where there is a high risk of contamination or spillage. Oil/ petrol separators can be specified in work section R12. • The remaining credit criteria require that the design of water pollution prevention systems is carried out in accordance with particular guidelines described in the credit criteria. Not directly influenced by NBS specification.
Pol 7 Reduction of night time light pollution	B/D	Work section V60.
Pol 8 Noise attenuation	B/D	<p>Award of this credit is dependant upon satisfying multiple criteria including determining whether any other existing buildings or noise sensitive areas are within an 800 m radius of the development. Where this condition is met a noise impact assessment must be carried out by a suitably qualified acoustic consultant. Where necessary, dependant upon the result of the noise impact assessment, measures must be installed to attenuate the noise at its source. Not directly influenced by NBS specification.</p>