

Briefing Paper

Health and wellbeing in BREEAM

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A key focus of BREEAM is the impact that a building or other asset has on the health and wellbeing of its occupants, visitors, neighbours and those involved in its procurement and construction. Since the first scheme was launched to address the design and construction of offices in 1990, improving indoor environmental quality and occupant health has been one of the main objectives of BREEAM.

The original BREEAM scheme was split into three parts, with an 'Indoor effects' section focussing on the impacts of buildings on the health, safety and wellbeing of occupants, recognising that people spend the majority of their time in buildings, and as such, better environmental conditions can have a significant impact on occupant wellbeing.

Over the years, BREEAM has expanded in scope to cover multiple building types, lifecycle stages, and scales of development. Whilst the breadth of issues covered has also grown, the assessment of health and wellbeing remains a key focus with most schemes having a category devoted to this issue, in addition to considering associated impacts in other categories such as Transport and Pollution.

With BREEAM in its 25th year as the world's foremost environmental assessment methodology for the built environment, this guide has been produced to provide an overview of how BREEAM continues to drive best practice and address the impacts of the built environment on health and wellbeing.

BREEAM

– An Introduction

A holistic assessment methodology

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's first sustainability rating scheme for the built environment. Through its application and use, BREEAM helps clients measure and reduce the impacts of their buildings and in doing so, create higher value, lower risk assets that are better for people and the environment.

All BREEAM schemes seek to ensure quality through an accessible, holistic and balanced measure of environmental impacts. A holistic approach to assessment is essential, since this helps to ensure that decisions are not made in isolation without considering all potential impacts. For example, changes to ventilation rates to improve air quality should be considered alongside the associated impacts on building energy consumption.

BREEAM assessments produce an overall rating which takes account of performance against a number of assessment issues, across a range of categories. In addition, individual category scores are provided to give a breakdown of performance against the key areas assessed by BREEAM, including Health and Wellbeing. Many clients focus on achieving a particular overall rating (e.g. Very Good, or Excellent), but it is possible to set additional requirements related to specific category scores, and in doing so, focus on performance in areas of particular interest. This means it is possible to benefit from a holistic methodology that ensures all impacts of any design decisions are accounted for, whilst also targeting high performance in one or more key areas.

All BREEAM schemes are developed and operated in accordance with a set of standards that ensure a common scientific and performance basis is used by all schemes. Compliance with these standards means that assessment issues are only included where:

1. The issue aim and proposed assessment criteria are underpinned by a robust evidence base
2. There is scope to improve beyond existing mandatory legislation, and value in doing so
3. There is potential to influence the issue at the lifecycle stage covered by the scheme in question

In addition to meeting these essential requirements, BREEAM schemes aim to set performance based criteria that are outcome focussed rather than overly prescriptive in terms of design solutions. This approach allows built environment professionals to use the most appropriate design and engineering solutions for the specific development.

Adhering to these requirements mean that BREEAM schemes do not include issues where there may be a questionable evidence base, or where it is difficult to demonstrate the value associated with specific outcomes. With respect to health and wellbeing, this means that issues like building layout or aesthetics where there is limited good practice guidance and the associated benefits are difficult to quantify, are not currently included.

Different life cycle stages

BRE Global Limited operates a number of different schemes both in the UK and internationally, each designed to assess the environmental performance of the built environment at different stages in the lifecycle. The international schemes are adapted to local circumstances. These schemes currently include:

- **BREEAM Communities** for large scale development projects and masterplanning
- **BREEAM New Construction** for new build, domestic* and non-domestic buildings
- **BREEAM In-Use** for existing non-domestic buildings in-use
- **BREEAM Refurbishment** for domestic and non-domestic building fit-outs and refurbishments

*The scope of the International New Construction scheme covers domestic buildings. At the time of writing, the Home Quality Mark (HQM) is under development and due for release in the UK in October 2015. The HQM will be used for assessing domestic buildings in the UK.

It is important to consider the different lifecycle stages since all present different opportunities for improving performance and reducing the impact of the built environment. BREEAM Communities provides a framework for considering the issues and opportunities that affect sustainability at the earliest stage of the design process for large developments e.g. influencing site layout (with a view to encouraging active travel), and the provision of green space and other amenities.

The New Construction and Refurbishment schemes focus on the building design and procurement process. At this stage it is possible to influence design decisions which will ultimately impact on the comfort, health and safety of building occupants e.g. designing glazed areas and building layout to improve daylighting, specifying materials with low emission levels for Volatile Organic Compounds (VOCs) to improve indoor air quality, or undertaking thermal modelling to demonstrate the building design and servicing strategy will be capable of delivering thermal comfort levels in accordance with best practice.

Decisions made in the design and procurement stages are significant in determining how buildings will perform and impact on health and wellbeing. However, actual performance for issues like air quality and occupant comfort often varies from predictions and should be tested to identify areas for improvement.

The BREEAM In-Use scheme is used to measure actual operational performance and benchmark this across a range of issues. It provides a framework for continual improvement and optimisation of performance. Measuring and improving operational performance is what matters most in terms of occupant comfort, health and safety, and as such, the In-Use scheme is a key part of the overall BREEAM strategy for addressing health and wellbeing.

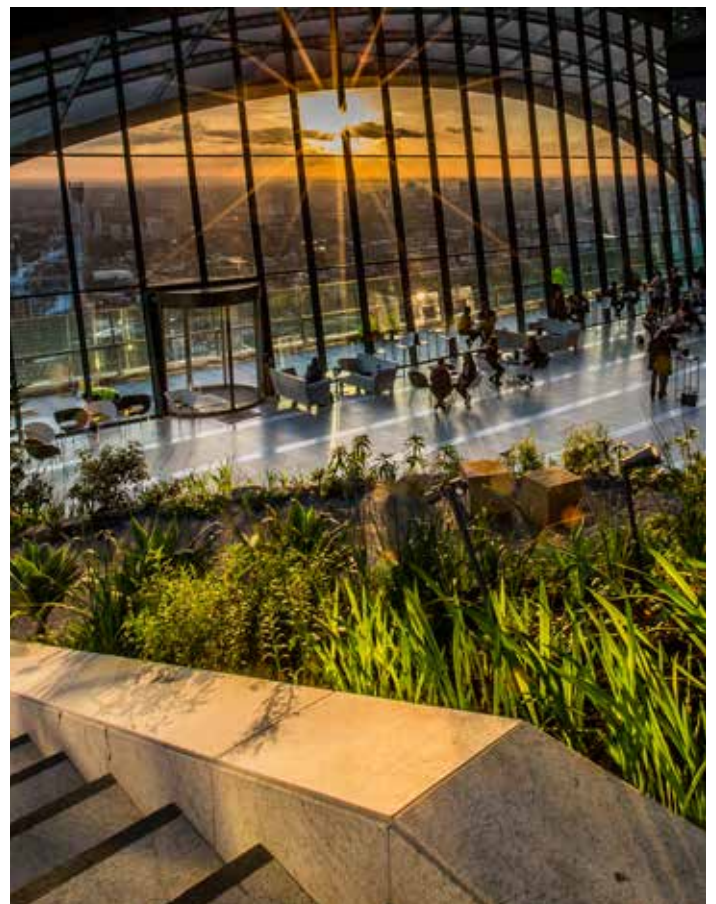
Accreditation

Independent accreditation ensures independence, competence and impartiality, all of which are essential ingredients for any certification scheme. BRE Global Limited is accredited by the United Kingdom Accreditation Service (UKAS) and is also certified to ISO 9001 for all its BREEAM related activities.

How BREEAM addresses health and wellbeing

BREEAM addresses health and wellbeing of occupants and other stakeholders in a number of ways across its criteria set. The health and wellbeing category is the most visible way that schemes address the impact of the built environment on health and wellbeing, but many other issues in other categories also support the achievement of healthy environments. BREEAM Communities for example addresses health and wellbeing impacts through multiple categories, such as 'Social and economic wellbeing' and 'Transport and movement', whilst the forthcoming Home Quality Mark will address the traditional health and wellbeing issues in the 'My Home' section and other impacts throughout the 'Our Surroundings' and 'Knowledge Sharing' sections.

Table 1 provides further detail on how BREEAM schemes and the Home Quality Mark address different aspects of the built environment that impact on health and wellbeing. The content of Table 1 focusses on users of assets and the surrounding area, but the assessment of health and wellbeing within BREEAM also extends to construction activities and the procurement of materials (through assessment issues addressing responsible sourcing). Whilst the content of Table 1 is based on BREEAM UK schemes, the scope of applicable issues may vary internationally as a result of differences in local regulations which may mean there is more or less potential for setting BREEAM criteria that exceeds mandatory minimum requirements.



How BREEAM addresses Health and Wellbeing across different life cycle stages of the built environment

Table 1

	BREEAM Communities	BREEAM NC / RFO	Home Quality Mark**
Indoor environment (Health and Wellbeing)	<ul style="list-style-type: none"> – Sustainable buildings 	<ul style="list-style-type: none"> – Visual comfort – Indoor air quality – Thermal comfort – Acoustic performance – Water quality 	<ul style="list-style-type: none"> – Indoor pollutants (VOCs) – Temperature – Ventilation – Daylight – Sound insulation
Ecology and outdoor space	<ul style="list-style-type: none"> – Ecology strategy – Public realm – Microclimate – Green infrastructure – Enhancement of ecological value 	<ul style="list-style-type: none"> – Various ecology issues seeking to maintain / enhance ecological value 	<ul style="list-style-type: none"> – Various ecology issues seeking to maintain / enhance ecological value – Recreational space
Active / Healthy Lifestyle	<ul style="list-style-type: none"> – Transport assessment – Cycling network – Cycling facilities – Delivery of services, facilities and amenities 	<ul style="list-style-type: none"> – Cyclist facilities – Travel plan 	<ul style="list-style-type: none"> – Alternative sustainable transport options – Growing space
Safety and security	<ul style="list-style-type: none"> – Flood risk assessment – Noise pollution – Land use (contaminated land) – Adapting to climate change – Flood risk management – Safe and appealing streets – Inclusive design 	<ul style="list-style-type: none"> – Safety and security (safe access) – Site selection (contaminated land) 	<ul style="list-style-type: none"> – Flood risk – Security
Health and wellbeing of users in surrounding area (Pollution)	<ul style="list-style-type: none"> – Light pollution – Water pollution – Flood risk management 	<ul style="list-style-type: none"> – NOx emissions – Surface water run off – Reduction of night time pollution – Noise attenuation 	<ul style="list-style-type: none"> – Managing the impact of rainfall – Impact on local air quality
Management / Consultation / Handover	<ul style="list-style-type: none"> – Consultation and Engagement – Design Review – Delivery of services – Community management of facilities 	<ul style="list-style-type: none"> – Project brief and design – Commissioning and handover – Aftercare 	<ul style="list-style-type: none"> – Commissioning and performance – Aftercare / home information – Smart homes – Post occupancy evaluation

** At the time of writing, the issues listed were subject to confirmation and final approval



BREEAM In-Use

	Part I: Asset Performance	Part II/III: Building/Occupier Management
Indoor environment (Health and Wellbeing)	<ul style="list-style-type: none"> - Daylighting - Glare Control - Thermal comfort (occupant control) - Ventilation (occupant control) - Microbial contamination - Light levels - Lighting (occupant control) - Ventilation (provision of fresh air) 	<ul style="list-style-type: none"> - Ventilation / fresh air rates - Operating temperature - Monitoring air quality - Monitoring noise - VOCs - Acoustic conditions - Deep cleaning - Legionella management
Ecology and outdoor space	<ul style="list-style-type: none"> - Indoor / outdoor rest space - Planted area / ecological features 	<ul style="list-style-type: none"> - External landscaping / maintenance - Active support of wildlife organisations - Provision of indoor planters
Active / Healthy Lifestyle	<ul style="list-style-type: none"> - Cyclist facilities - Pedestrian and cyclist safety 	<ul style="list-style-type: none"> - Provision / subsidisation of sports facilities - Health plans / fitness club discounts - Incentives for traveling to work by foot or bike - Provision of rest areas / refreshment facilities
Safety and security	<ul style="list-style-type: none"> - Inclusive design - Security measures - Alarm systems - Hazard risk assessment - Flood risk assessment 	<ul style="list-style-type: none"> - Risk management (fire risk assessment) - Land contamination mitigation
Health and wellbeing of users in surrounding area (Pollution)	<ul style="list-style-type: none"> - NOx emissions 	<ul style="list-style-type: none"> - Night time light pollution - Risk management - Monitoring and targeting
Management / Consultation / Handover	N/A (covered in Part II)	<ul style="list-style-type: none"> - Building user guide - Building user education - Building user information - Occupant satisfaction (internal environment) - Monitoring and targeting

'Indoor environment'

The indoor environment issues that are associated with occupant health and comfort make up the traditional health and wellbeing category and are present in all schemes with the exception of BREEAM Communities, which does not address detailed building design. Table 2 summarises the respective issues and the impacts they are designed to mitigate.

Table 2 – Indoor environment issues and associated impacts

Issue	Impact
Visual Comfort	<ul style="list-style-type: none"> – Daylight: lack of daylight / natural light can have a number of physiological and psychological effects on human health, including disruption to the human circadian system and the body's sleep/wake cycle ^{[1] [2]} – View outside: A view satisfies the physiological need of the eye to change focus, and also provides awareness of the environment beyond the building ^{[1] [3] [4]} – Illuminance / glare: Appropriate lighting design is necessary to avoid undue visual fatigue and discomfort ^{[2] [5] [6]} – Flicker (associated with fluorescent lighting): Cause of headaches and eyestrain ^{[2] [5] [6]}
Thermal Comfort	<ul style="list-style-type: none"> – Being uncomfortably hot or cold can lead to adverse effects on performance, and extreme temperatures can lead to heat exhaustion or hypothermia ^[7] – High relative humidity can cause the proliferation of mould, leading to respiratory illness and allergies. Low humidity can cause dryness of the throat and eyes ^[7]
Indoor air quality	<ul style="list-style-type: none"> – Exposure to air pollutants can have a significant detrimental impact on human health ^[8] – Poor indoor air quality is likely to contribute to Sick Building Syndrome ^[9]
Water quality	<ul style="list-style-type: none"> – Water quality has considerable implications for health due to the potential for microbial and chemical contamination ^[10]
Acoustic comfort	<ul style="list-style-type: none"> – The potential effects of noise include hearing impairment, disturbance of sleep and rest, anxiety, stress, and general annoyance ^{[11] [12]}

'Ecology and outdoor space'

All BREEAM schemes seek to promote ecological value and the provision of green space. Access to green space and nature has multiple benefits for physical and mental health and wellbeing ^[13]. Cumulatively, the provision of green space and other natural environments improves air quality, reduces urban heat island effect, creates space for social interaction and provides carbon sequestration. All of these benefits directly or indirectly support health and wellbeing.

'Active and healthy lifestyles'

It is accepted that physical activity can help to prevent obesity and associated conditions (e.g. heart disease, diabetes and cancer), but there are also considerable health benefits for all people regardless of weight ^[14]. Many BREEAM assessment issues promote active lifestyles to recognise these benefits. BREEAM Communities for example, encourages the provision of appropriate leisure activities (gyms, swimming pools, children's play equipment, etc.) and green space where people can exercise and enjoy the outdoors. The benefits of leading a healthy lifestyle incorporating regular exercise are also promoted through rewarding the provision of sports facilities and fitness club discounts in the BREEAM In-Use scheme.

'Safety and security'

This section covers issues like safe access, security and crime prevention, all of which have significant social implications and can have a considerable impact on general quality of life and health ^{[15] [16]}. Poor perceptions of safety and crime can impact health as residents are not comfortable walking around communities, reducing physical activity and social interaction. Safe access to buildings and communities ensures that pedestrian and cyclist routes are well-lit and not impacted by vehicles and delivery vehicles. BREEAM Communities has an issue on 'Safe and appealing streets' which explicitly addresses the needs of children and other vulnerable road users and the benefits of streets as places for interaction.

'Health and wellbeing of users in the surrounding area'

The issues under this heading consider the impacts of the built environment on the health and wellbeing of users in the surrounding area. Table 3 breaks the potential impacts down into those associated with chemical, and non-chemical pollution.

Table 3 Health impacts of chemical and non-chemical pollution

Issue	Impact
Chemical pollution	<ul style="list-style-type: none"> – Surface / Ground water pollution: Could impact public drinking supplies ^{[17] [18]} – Ground / soil pollution: Can potentially enter the food chain, and present serious risks to human health through direct contact with contaminated soil ^{[19] [20]} – Air pollution: Can result in reduction in lung function, shortness of breath, and other respiratory symptoms ^[21]
Non-chemical pollution	<ul style="list-style-type: none"> – Light pollution: Can have damaging impacts for ecology, but also result in issues like sleep deprivation, discomfort and general annoyance ^{[22] [23]} – Noise pollution: Potential effects include hearing impairment, disturbance of sleep, and general annoyance ^[24]

'Management, consultation, and handover'

All BREEAM schemes seek to encourage robust management, consultation and handover processes, and these processes are as applicable to health and wellbeing as they are to any other category. The relevant assessment issues seek to address problems that can arise through a lack of consultation during the design stage, or poor handover arrangements post construction e.g. buildings not being designed with all stakeholder needs in mind, and buildings not being operated as intended. In terms of health and wellbeing, this could mean ensuring that the relevant building systems have been properly commissioned, and building occupants are briefed on how to operate the systems in order to ensure acceptable internal environmental conditions are maintained.

In masterplanning projects, community consultation and participatory design take on far greater importance as the scale of the impact grows with the scale of the development. BREEAM Communities requires consultation with the community, local authority and multiple private and public stakeholders in determining how a development will be designed and what facilities will be provided.

Future development

Since the first scheme was launched in 1990, BREEAM has evolved and continued to drive best practice performance as industry and regulations catch up. The assessment of health and wellbeing has broadened over time from the core 'indoor environment' issues to consider many other elements of planning, design and management that are also known to impact upon health and wellbeing. Moving forward, the scope and content of BREEAM will be kept under review, and as new science and technologies emerge, schemes will continue to be updated in order to ensure they set requirements that drive the industry forward and set a benchmark for best practice.

Another part of the BREEAM development strategy is to improve 'accessibility' through the way in which schemes are delivered. One way of doing this is to introduce more flexibility and additional options with respect to the outputs generated by a BREEAM assessment. This could for example mean the creation of a score or indicator that accounts for performance against the full range of issues that impact on health and wellbeing, i.e. not just those within the Health and Wellbeing category. The Home Quality Mark will be the first scheme to adopt this approach through generating a 'My Wellbeing' indicator, and if successful, a similar approach could be used for other BREEAM schemes in the future.

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Further details on the BREEAM criteria can be found in the relevant scheme manuals. Copies of the manuals can be downloaded free of charge from www.breeam.com/resources



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BRE Trust

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