

## Briefing Paper

# Strategic approach to the selection and procurement of construction materials and products

**Alan Yates**



The selection and procurement of construction materials makes a major contribution to the life cycle impacts of a building across the environmental, social and economic aspects of sustainability. Much is talked about materials selection and many sources of information are available mostly at the level of an individual material. BREEAM seeks to encourage the whole building consideration of materials through the use of robust and science based approaches during the design and procurement of buildings, infrastructure and others aspects of the built environment.

Responsible sourcing covers consideration of social, economic and environmental risk factors including the consideration of life cycle environmental impacts which are inherently more quantifiable at a project level. BREEAM rewards developments where independent responsible sourcing certification is used to minimise the risks arising from materials/products selection. In addition, however, BREEAM encourages the use of Life cycle assessment (LCA) to quantify and where possible benchmark whole building embedded environmental impacts to further influence the selection of materials and products. Finally durability and innovation are aspects of materials/product selection that BREEAM will continue to recognise

By taking this approach BREEAM aims to promote the take-up and harmonisation of standards and methodologies. As BRE further develops BREEAM, it will do so along the lines set out in this document taking full account of specific needs and opportunities relating to project type and life cycle stage.

# 1. Responsible sourcing of construction materials

Construction materials typically involve complex procurement process and supply chains which are international in their scope. This results in higher risk of negative social, economic and environmental impacts. In determining responsible sourcing policies and targets it is important that a robust, holistic and transparent process is adopted as far as is practical accepting that limitations exist through commercial sensitivity and 'bunkered' supply chains (where multiple sources are routinely mixed outside the influence of the organisation being assessed and so cannot be traced further back').

Independent and holistic responsible sourcing certification schemes (RSCS) provide confidence to specifiers and clients that construction materials/products have been procured in a way that minimises the risks associated with negative impacts. Given the diverse nature of material supply chains, BREEAM's recognition of these schemes relates to the scope and degree of scrutiny and verification that they provide rather than quantification of these impacts. A number of well recognised and established international/national protocols, codes of practice and framework standards exist that set out practical, good practice requirements and these form the basis for BREEAM's recognition of credible RSCS.

As BRE develops and updates its BREEAM schemes it will adopt a tiered approach to the recognition of responsible sourcing actions by:

- a. Encouraging the control and monitoring of materials procured at site level through a holistic Responsible Sourcing Plan. This will require designers and constructors to consider the potential risks relating to the sourcing of materials/products and take steps to minimise these. This will cover all significant materials procured at the site level.
- b. Encouraging the specification of products covered by an independent and credible RSCS
  - a. Based on worst case products per material group in each key element for cases where projects are simple in nature or where resources will not allow a fuller analysis.
  - b. Based on mass/volume of materials/products per material group in each key element where this is possible.



## 2. Life cycle assessment (LCA)

With operational energy consumption decreasing, it is becoming increasingly important to consider life cycle environmental impacts associated with construction materials/products. Whole building LCA provides the most robust way of ensuring a fair and balanced assessment. LCA should be based on high quality, comparable and up to date data that is open to scrutiny. BREEAM will promote the take-up of Environmental Product Declarations (EPD) and LCA methodologies regardless of provider where they meet the objectives set out in this document. The advent of EN 15804: Sustainability of construction works – Environmental Product Declarations – core rules for the product category of construction products, is a significant step forward in the harmonisation of tools and methods. However there are varying interpretations and applications of this standard, such as the sourcing of underpinning data and the setting of assessment boundaries. These variations lead to divergent results when comparing outputs from different compliant methods. For this reason it is critical that the same product category rules (PCR) and data are used wherever direct comparisons are being made or where outputs are being aggregated. A failure to do this could lead to a highly inaccurate representation of environmental choices.

In promoting LCA through future scheme development, BREEAM will:

- a. Encourage designers and procurers to make decisions on the basis of robust and credible environmental LCA data through the use of EN 15804 compliant EPD and LCA studies. Whilst it is recognised that there are significant variations in the underpinning data, boundary assumptions and methodologies adopted by different EPD providers, there is value in encouraging product and material manufacturers to publish credible data on their products. BREEAM schemes will, therefore, reward the specification of materials/products covered by EN 15804 compliant EPD regardless of provider.
- b. Encourage designers to use robust whole building LCA tools to quantify life cycle impacts and reduce these. BREEAM schemes will reward the use of recognised LCA tools and where appropriate will differentiate between the use of simple/reduced scope tools and more accurate holistic tools.
- c. Benchmark whole building life cycle impacts arising from materials specification wherever possible against local best practice. In order to achieve this the use of comparable data and methodologies will be critical to the credibility of benchmarking. Where appropriate/possible BREEAM will:
  - i. Use peer reviewed generic data which is regionally relevant and is taken from a consistent data source.
  - ii. Additionally reward the refinement of whole building LCAs through the use of proprietary data taken from third party EPD to provide greater accuracy. Comparable datasets, assessment boundaries and methodologies will be required to ensure a fair and balanced comparison is made. BRE will accept any third party verified EPD that can meet these requirements.
  - iii. BREEAM will encourage the sharing of LCA data to inform the future maintenance and improvement of benchmarks. Benchmarking is dependent on the robustness and validity of the data used to determine performance thresholds and it is likely that embedded impacts will vary over time.

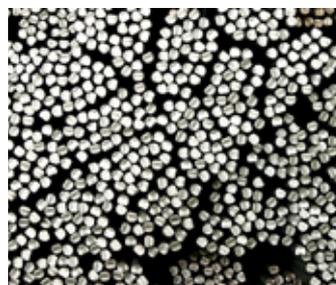
## 3. Performance in use

BREEAM will seek to reinforce resilience in construction materials as schemes are developed and updated. This will involve consideration of a range of diverse issues around material selection including:

- a. Material degradation arising from pollution, weathering and general wear and tear.
- b. Adaptability to changing demands arising as a result of building function, climate, loadings etc.
- c. Health and wellbeing impacts resulting from materials selection including emissions and comfort factors.
- d. Longevity of whole building performance through recognition of materials with enhanced whole life performance in terms of energy use, durability and occupant comfort.
- e. Life Cycle Costing to inform decision making and reduce future costs and impacts for occupiers, owners and managers.

## 4. Innovative materials

BRE recognises that the benefits of innovative materials and products are often not fully reflected through LCA and other established whole building analysis methods. Such innovation is the life blood of a dynamic and forward looking industry and as such BREEAM will seek to promote the use of such innovative materials where performance outcomes and impacts are monitored and openly reported on. BREEAM will, therefore, provide additional recognition for the appropriate specification of innovative materials through the awarding of Innovation Credits.



## 5. How BREEAM addresses the selection and procurement of construction materials across the life cycle stages of the built environment

BREEAM has addressed materials specification and procurement issues since it was first launched in 1990 and has been active in promoting the take up of both responsible sourcing and life cycle assessment during this period. Coverage of materials issues in BREEAM has evolved as awareness and take-up has increased within the industry and to keep abreast of current practice.

Table 1 sets out the current scheme issues that relate to the strategy themes and so influence decision making on the selection and procurement of construction materials and products. As these schemes are updated this strategy will be used to refine the coverage of materials related issues within them.

**Table 1: Current scheme issues relating to strategy themes**

	Responsible sourcing of materials and products	Life cycle assessment (LCA)	Performance in use	Innovative materials
<b>Masterplanning</b>				
<b>BREEAM Communities</b>	<ul style="list-style-type: none"> <li>– Existing Buildings and Infrastructure (RE02)</li> <li>– Sustainable Buildings (RE04)</li> </ul>	<ul style="list-style-type: none"> <li>– Low impact materials (RE05)</li> <li>– Sustainable Buildings (RE04)</li> <li>– Resource Efficiency (RE06)</li> </ul>	<ul style="list-style-type: none"> <li>– Local Vernacular (SE14)</li> <li>– Sustainable Buildings (RE04)</li> </ul>	<ul style="list-style-type: none"> <li>– Sustainable Buildings (RE04)</li> </ul>
<b>Buildings – New Construction, Refurbishment and Fit-out</b>				
<b>BREEAM NC/ RFO (UK and International schemes)</b>	<ul style="list-style-type: none"> <li>– Responsible Sourcing of Construction Materials (MAT03)</li> </ul>	<ul style="list-style-type: none"> <li>– Life Cycle Impacts (MAT01)</li> <li>– Hard Landscaping and Boundary Protection (MAT02)</li> <li>– Insulation (MAT04)</li> <li>– Speculative Finishes (WST04)</li> <li>– Materials Efficiency (MAT06)</li> </ul>	<ul style="list-style-type: none"> <li>– Life Cycle Costing and Service Life Planning (MAN02)</li> <li>– Insulation (MAT04)</li> <li>– Designing for Durability and Resilience (MAT05)</li> <li>– Adaptation to Climate Change (WST05)</li> <li>– Functional Adaptability (WST06)</li> <li>– Indoor Air Quality – VOCs (HEA02)</li> <li>– Thermal Comfort (HEA04)</li> <li>– Acoustic Performance (HEA05)</li> </ul>	<ul style="list-style-type: none"> <li>– Innovation Credits</li> </ul>
<b>Home Quality Mark (Beta)</b>	<ul style="list-style-type: none"> <li>– Responsible Sourcing of Construction Products (2.03.01)</li> </ul>	<ul style="list-style-type: none"> <li>– Environmental Impact from Construction products (2.03.02)</li> </ul>	<ul style="list-style-type: none"> <li>– Indoor Pollutants (2.01.01)</li> <li>– Sound Insulation (2.01.04)</li> <li>– Temperature (2.01.05)</li> <li>– Life Cycle Costing of Construction Products (2.03.03)</li> <li>– Durability of Construction Products (2.03.04)</li> </ul>	N/A

Table 1 (continued): Current scheme issues relating to strategy themes

	Responsible sourcing of materials and products	Life cycle assessment (LCA)	Performance in use	Innovative materials
<b>Existing Buildings</b>				
<b>BREEAM In-Use – Part I</b>	N/A	N/A	<ul style="list-style-type: none"> <li>– Future Adaptation (MAT06)</li> <li>– Designing for Robustness (MAT07)</li> </ul>	N/A
<b>BREEAM In-Use – Part II/III</b>	<ul style="list-style-type: none"> <li>– Sustainable Procurement policy (MAT09)</li> <li>– Sustainable Procurement (MAT10)</li> <li>– Material Procurement (MAT15/16)</li> <li>– Supplier Environmental Management (MAT17, MAT18, MAT19, MAT20, MAT21, MAT22)</li> <li>– Supplier Responsible Sourcing (MAT22)</li> <li>– Environmental management issues (MAN15)</li> </ul>	N/A	<ul style="list-style-type: none"> <li>– Building Adaptation (MAN13)</li> <li>– Internal environment: refurbishment/renovation/redecoration (HEA17)</li> <li>– Volatile Organic Compounds – VOCs (HEA18)</li> </ul>	N/A
<b>Infrastructure</b>				
<b>BREEAM Infrastructure (Pilot)</b>	<ul style="list-style-type: none"> <li>– Responsible sourcing of materials (Mat 02)</li> </ul>	<ul style="list-style-type: none"> <li>– Whole life environmental impacts (ID 06)</li> <li>– Environmental life cycle impacts (Mat 01)</li> <li>– Materials efficiency (Mat 03)</li> <li>– Reuse and recycling (Mat 04)</li> </ul>	<ul style="list-style-type: none"> <li>– Whole life costing (ID 05)</li> <li>– Durability (Res 05)</li> </ul>	<ul style="list-style-type: none"> <li>– Innovation Credits</li> </ul>
<b>CEEQUAL (Civil Engineering Environmental Quality scheme)</b>	<ul style="list-style-type: none"> <li>– Overall strategy for construction (1.2)</li> <li>– Responsible sourcing, re-use and recycling of materials (8.7)</li> <li>– Wastes and management of arisings (8.10)</li> </ul>	<ul style="list-style-type: none"> <li>– Project resources strategy (1.1.6)</li> <li>– Physical resources use and management – Basic principles (8.1)</li> <li>– Embodied impacts (8.2)</li> <li>– Design for resource efficiency (8.3)</li> <li>– Wastes and management of arisings (8.10)</li> <li>– Contractual and procurement processes (2.3)</li> <li>– Delivering performance on environmental and social aspects (2.4)</li> </ul>	<ul style="list-style-type: none"> <li>– Design for resource efficiency (8.3)</li> <li>– Minimising use and impacts of hazardous materials (8.8)</li> </ul>	N/A

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](http://www.breeam.com/resources)



## BREEAM25

Over the last 25 years BREEAM has evolved and grown to reflect advances in science, technology, policy and business.

BREEAM is the world's leading sustainability assessment method for buildings and communities, with more than 530,000 certificates issued and a global reach encompassing more than 70 countries. Find out more about BREEAM's achievements over the last 25 years by visiting our dedicated microsite [www.breeam.com/breeam25](http://www.breeam.com/breeam25)

© BRE Global Ltd 2015

Permission is granted for this report to be distributed only in its entirety, without amendment, and with copyright attribution to BRE Global Ltd.

Every effort has been taken to ensure the accuracy of this report but no warranty is made in respect of any conclusions or opinions expressed herein. BRE Global Ltd's liability in respect of this report and any reliance thereupon is disclaimed and BRE Global shall have no liability to third parties to the extent permitted in law.

BREEAM is a registered trade mark owned by BRE (the Building Research Establishment Ltd. Community Trade Mark E5778551). The BREEAM marks, logos and symbols are the Copyright of BRE and are reproduced by permission.

### BRE Trust

The BRE Trust uses profits made by BRE Group to fund new research and education programmes, that will help it meet its goal of 'building a better world together'.

The BRE Trust is a registered charity in England & Wales: No. 1092193, and Scotland: No. SC039320.

### BRE Global

Bucknalls Lane  
Watford  
United Kingdom  
WD25 9XX

T +44 (0)333 321 8811  
E [breeam@bre.co.uk](mailto:breeam@bre.co.uk)  
[www.breeam.com](http://www.breeam.com)