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S-DP1

MATERIALS OVERVIEW

TARGET AUDIENCE & OBJECTIVES: This information sheet is intended to provide a broad overview of the different issues currently associated with construction material choice and is intended for all construction professionals who would like signposting to more detailed information as well as a general introduction to the broader issues surrounding construction materials.

1. INTRODUCTION

This information sheet provides an introduction and overview of some of the key issues surrounding construction materials and their sustainable use in the construction industry.

There are many issues directly associated with the sourcing and specification of materials to be used in a construction project. For many, this will begin at the design stage, where materials are specified. For others it will be even earlier; when a company (or even national government) forms its policies and makes decisions on what materials are or are not acceptable on environmental, economic or social grounds. There are many issues that must be considered under the banner 'construction materials' and this information sheet will provide an introduction to the main issues, while providing information about how these issues overlap and where to find more detailed information on the sub-issues.

2. ENVIRONMENTALLY SUSTAINABLE MATERIAL CHOICES

As the operational performance of building increases, the environmental impacts associated with the materials used to construct the building become increasingly more significant. For the operation of any building, the direct environmental impacts can be mostly attributed to the energy used by the occupants for heating, cooling, cooking, electrical equipment etc. For the materials used to the construct the building, however, there is a more tangible set of environmental impacts that can be directly attributed to them.

These impacts can include; the extraction of raw materials leading to scarcity of often finite resources; the transportation of the raw materials form source and of finished product to its destination and the vast amount of energy that is used in the manufacturing of many construction materials as well as intensive water use, local pollution of water courses or the emitting of gases to the atmosphere that can contribute to acid rain and/or climate change.

Further to this is the influence that such things as changes to government legislation and building regulations; technological improvements and consumer demands may have on the construction materials market. For more information and direction on construction material choice please refer to the key signposting below and Information sheet S-DP2.

3. WASTE DISPOSAL AND RECYCLING

The construction industry is responsible for a significant amount of waste produced in the UK every year. In an industry that typically uses over 400 Mt of materials, over 300Mt of this is primary/virgin material while nearly 100Mt, ultimately, is not incorporated into the built environment and becomes waste[1] . There is clearly much room for improvement and efficiencies that can be achieved on these figures and several aspects can combine to achieve this:

- More efficient material use within the industry to reduce the waste arising at all
- Increased use of recycled materials i.e. re-claim for re-use
- Increased use of materials and products arising from re-processed from other waste streams.
- Improved waste management and resource effi ciency, to increase the re-direction of waste into re-processing streams and reduce the use of un necessary materials.

It is this issue of linking waste themes to material themes that is critical to achieving the greatest reductions and therefore to meeting aspirational targets such as Zero Waste Scotland[2] .

For more information and direction on waste disposal and recycling please refer to the key signposting below and Information sheet S-DP3

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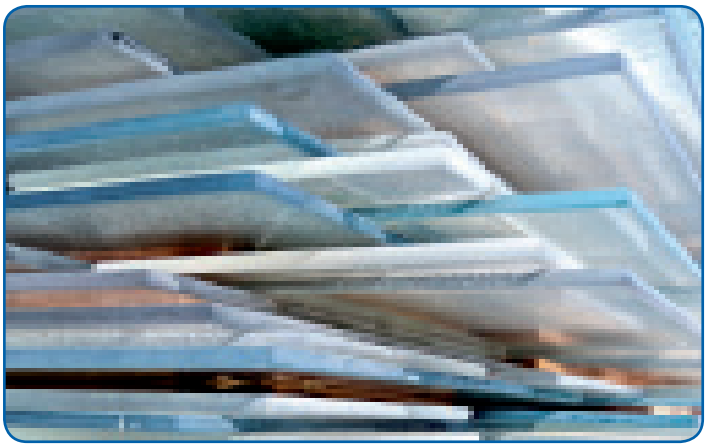

4. 'RESPONSIBLE SOURCING' AND 'STEWARDSHIP' SCHEMES

A key aspect to sustainable construction materials rests on how the materials have been sourced; where the materials have come from, how the materials have been obtained and who has been involved. There is also a vital social element to responsibly sourcing materials since it will help ensure that the illegal and undocumented exploitation of people and land is prevented; but there can also be an important environmental aspect. This is the added benefits that can be gained from local, short supply chains which can help reduce pollution associated with transportation particularly.

Schemes that assure the sourcing of materials generally fall into one of two types: Those that focus more on the management of the raw material, including the land from which they are sourced such as the Forest Stewardship Council (FSC) or The Programme for the Endorsement of Forest Certification (PEFC), and those whose emphasis is more focussed on the supply chain and 'Corporate Social responsibility' measures taken such as BES:6001 developed by BRE and the newly launched BSI standard BSI 8902.

For more information and direction on responsible sourcing & stewardship schemse please refer to the key signposting below and information sheet S-DP4.

5. DESIGN

Integral to realising increased sustainability in the construction industry is design. The design process can be used to ensure that sustainable practices are adhered to, since the design can integrate with other processes such as material specification and procurement systems by stipulating minimum standards or performance levels. Truly sustainable design processes will meet the social, economic and environmental requirements of the building users while incorporating sustainable building management to deliver reduced building running costs. With advances in the sustainable technology and materials available too, design can evolve to take advantage of these advances into projects from the concept stages where it may not have been possible before.

Along with designing for construction and occupation of any building, designing for the deconstruction of a building is becoming increasingly important in its contribution to the sustainability of the construction industry. By considering the post-use phase of a building, elements can be utilised in the design process to ensure that the building is as easily deconstructed as possible at the end of its life cycle and that materials, in particular, can be extracted and reused or re-processed to be used again. This builds on the notion of a 'cradle to cradle' lifecycle for construction materials; where the lifecycle in considered beyond the use-phase of a particular building, product or material into the usable phase of another product rather than a disposal stream. This is discussed in further detail, along with further elements of designing for sustainability in information sheet S-DP5.

6. SUSTAINABLE PROCUREMENT

The procurement process has a crucial role in the increasing sustainability of the construction industry. Sustainability criteria can be adopted across the whole procurement process and does not just refer to the 'purchasing' of items. The procurement process can start with the definition of a need, followed by evaluating options, specification, design, selecting a supplier and the evaluation of tenders. The procurement process then continues after the 'purchase' with post-contract management and supplier development and relations[3].

For the construction industry, procurement of construction materials clearly represents a significant proportion of all procurement, but this not the only area that will benefit from more sustainable procurement processes. There is much scope, too, in applying sustainable procurement in areas including waste management, energy procurement, vehicle procurement and plant procurement to list just a few.

Integral to effective the sustainable procurement process is whole life costing. Using whole life costing will reveal the best value for procurement over the whole lifecycle, leading to financial savings over the long term. In sustainability terms , this may be particularly relevant to support the procurement of items that will contribute to overall environmental impact, emissions savings, fuel savings or running costs but may have a higher initial capital cost. When considered over the whole life cycle, the true value of the more sustainable emissions should emerge.

For more information and direction on sustainable procurement please refer to the key signposting below, Information Sheet S-DP6. (Sustainable Procurement) and Information Sheet S-EV1 (Whole Life Costing).

REFERENCES

1	UK mass balance report available at: www.massbalance.org/resource/massbalance
2	From http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1
3	Adapted from: WRAP report available at www.idea.gov.uk/idk/aio/69979

MATERIALS OVERVIEW

SIGNPOSTING

SUSTAINABLE MATERIAL CHOICES

TITLE & DESCRIPTION	LINKS
BRE Green Guide to Specification: A reference book and associated website providing information on relative environmental impact comparisons for a range of building materials and components on an elemental basis for comparison.	http://www.thegreenguide.org.uk
BRE GreenBookLive: A free online database designed to help specifiers and end users identify products and services that can help reduce their impact on the environment.	http:// www.greenbooklive.com
Greenspec: A website resource providing a broad range of information and services for sustainable building, with an emphasis on green and sustainable building materials.	http:// www.greenspec.co.uk

WASTE & RECYCLING

TITLE & DESCRIPTION	LINKS
Scottish Environmental Protection Agency (SEPA): Useful waste information, data and resources from Scotland's environmental regulation body.	http:// www.sepa.org.uk/waste.aspx
Department for Environment, Food and Rural Affairs (Defra): Information covering a broad range of waste-related topics, provided by the UK government.	http://www.defra.gov.uk/environment/waste/index.htm
Zero Waste Scotland (Formerly WRAP Scotland): Set up to deliver the Scottish Government's Zero Waste policy goals. Provides advice and support to businesses and individuals on how to use resources more efficiently, reduce waste and recycle more.	http:// www.zerowastescotland.org.uk/
Envirowise Scotland: Waste management information, services and events.	http://www.envirowise.gov.uk/scotland/Topics-and-Issues/Waste-Management.html

RESPONSIBLE SOURCING

TITLE & DESCRIPTION	LINKS
The Forest Stewardship Council (FSC)	http:// www.fsc-uk.org
The Programme for the Endorsement of Forest Certification (PEFC)	http:// www.pefc.co.uk
BES 6001: A framework for responsible sourcing developed by BRE	http://www.greenbooklive.com/page.jsp?id=153
BSI:8902: The British Standards Institute sector standard framework for responsible sourcing	http://shop.bsigroup.com/ProductDetail/?pid=000000000030191223 (purchase and download link)

DESIGN

TITLE & DESCRIPTION	LINKS
CIC Start Online aims to embed sustainable building design and refurbishment into practice. The project will assist Scottish small and medium sized enterprises (SMEs) to develop and test innovations	http://www.cicstart.org/content/home/1/
The Scottish Ecological Design Association: Aims to "to promote the design of communities, environments, projects, systems, services, materials and products which enhance the quality of life of, and are not harmful to, living species and planetary ecology".	http:// www.seda.uk
Building Sustainable Design: Magazine and website for building services engineers, architects, clients and all construction professionals who care about sustainable, low energy design in the built environment.	http:// www.bsdlive.co.uk
Eco-design information provided by Envirowise	http://www.envirowise.gov.uk/uk/Topics-and-Issues/Eco-Design.html
DesignBox is Envirowise's online designer's forum. Allows users to discuss eco-design, meet new contacts and ask the experts for tips on gaining cost savings through efficient design and improving your environmental impact.	http://designbox.envirowise.gov.uk/

SUSTAINABLE PROCUREMENT

TITLE & DESCRIPTION	LINKS
Department for Environment, Food and Rural Affairs (Defra): Information relating to the UK national plan for sustainable procurement.	http://www.defra.gov.uk/sustainable/government/publications/procurement-action-plan/index.htm
The Sustainable Procurement Cupboard: provides a framework for procurement professionals to find case studies, tools, primary documents, and other content to help them to address the field of sustainable procurement.	http://www.procurementcupboard.org/
Sustainable Scotland Network: aimed at Local Authorities but contains much useful information on sustainable procurement in Scotland	http://www.sustainable-scotland.net/page.asp?pg=26