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A+

environmental impact of paving

SUMMARISING THE GREEN GUIDE, BREEAM AND THE CODE FOR SUSTAINABLE HOMES

Interpave

THE PRECAST CONCRETE PAVING AND KERB ASSOCIATION

Introduction

Selecting sustainable construction materials can be a difficult challenge for specifiers, particularly with claims and counter-claims from different sides of the construction industry. However, the new BRE *Green Guide to Specification* offers useful independent guidance, based on Life Cycle Assessment, in the form of simple ratings for various construction elements – including paving in various applications.

These ratings can then be applied to other environmental assessment tools for specific projects, such as BREEAM 2008 and the *Code for Sustainable Homes*. While the Green Guide looks just at construction elements as built, these other tools reward positive impacts of elements in use, including concrete block permeable paving – an important sustainable drainage system (SUDS) technique. Taking a wider view of sustainability, there are also other criteria by which paving materials can be assessed by specifiers.

This document aims to summarise all this guidance, focusing on precast concrete paving.

The Green Guide

The BRE *Green Guide to Specification* is a new on-line tool providing designers and specifiers with straightforward and independent guidance on making the best environmental choices. It rates and compares a range of specifications within various construction elements, with summary ratings ranging from 'A+' for best environmental performance to 'E' for the worst. The summary rating is a measure of overall environmental impacts covering the following issues:

- Climate change
- Water extraction
- Mineral resource depletion
- Stratospheric ozone depletion
- Human toxicity
- Ecotoxicity to freshwater
- Nuclear waste
- Ecotoxicity to land
- Waste disposal
- Fossil fuel depletion
- Eutrophication
- Photochemical ozone creation
- Acidification

For more information on the Green Guide, visit:
www.thegreenguide.org.uk

Paving ratings

Three different paving scenarios (together with 'boundary protection') constitute the Landscaping category of the Green Guide and cover: Pedestrian Areas, including communal spaces, walkways and garden paving; Lightly Trafficked Areas, such as car parking; Heavily Trafficked Areas, for heavier vehicles or repetitive traffic. The same three scenarios – with identical results – are applied across the six different building types considered by the Green Guide. But the ratings also provide essential guidance for local authorities to exercise their responsibilities for sustainable materials on roads and public spaces unrelated to particular buildings.

The summary environmental ratings for the various precast concrete paving specifications considered are as follows –

Rating	Specification
Pedestrian Areas	
A	50mm thick concrete blocks with no sub-base
A+	35mm thick concrete paving flags with no sub-base
[B]	[100mm thick concrete cellular units for grass with no sub-base. In fact, this specification is unlikely to be used here, as these products are specifically designed for trafficking]
Lightly Trafficked Areas	
A+	60mm thick concrete blocks over prepared recycled sub-base
A	60mm thick concrete blocks over prepared sub-base
A+	60mm thick concrete paving flags over prepared recycled sub-base
A	60mm thick concrete paving flags over prepared sub-base
A	120mm thick concrete cellular units for grass over prepared sub-base (using on-site available material)
Heavily Trafficked Areas	
A	80mm thick concrete blocks over prepared recycled sub-base
B	80mm thick concrete blocks over prepared sub-base
A+	120mm thick concrete cellular units for grass over prepared sub-base (using on-site available material)

These ratings provide independent endorsement of the low environmental impact of precast concrete paving, particularly in comparison with imported materials, helping specifiers and local authorities to make responsible material choices. They also reflect the on-going environmental investments and improvements made by Interpave manufacturer members, as well as by the cement industry generally. Although not considered in the Green Guide, precast concrete kerbs will have similar environmental characteristics to concrete flags, whereas alternative kerbing materials such as plastic remain an unknown quantity.

Local material sourcing and product supply is also a key element of sustainable construction, and equivalent paving products shipped into the country bear a substantial CO_2 emission load over those locally supplied. Some imported stone paving products are also included in the Green Guide – generally with much poorer ratings than their precast concrete equivalents and half with the worst 'E' rating.

BREEAM & the Code for Sustainable Homes

Green Guide ratings also form an important part of BREEAM *(Building Research Establishment's Environmental Assessment Method)* a widely used environmental assessment method for buildings, with the new version taking effect from August 2008. Various versions have been created to suit specific common building types, as well as a bespoke version for others. With BREEAM 2008, credits are awarded in nine categories according to performance and added together to produce a single overall score on a scale ranging from 'Pass' to the newly added 'Outstanding' category.

A similar approach is also taken with the Code for Sustainable Homes, which replaces Ecohomes, and the government has confirmed that it is mandatory for all new homes to have a rating against the Code. Ratings range from Code Level 1 – 'above regulatory standards' up to Code Level 6 – 'aspirational standard based on zero carbon emissions for the dwelling and high performance across all environmental categories'. The Code will, inevitably, play a major role in the eco-towns currently proposed by government.

Choice of paving materials

Taking the BREEAM Educational Building version as an example, 1 credit is available where at least 80% of the combined area of external hard landscaping and boundary protection specifications achieve a Green Guide A or A+ rating – as shown earlier, generally the case with precast concrete paving.

Permeable paving in use

However, both BREEAM and the Code also address the benefits of concrete block permeable paving as a sustainable drainage systems (SUDS) technique. SUDS already form part of government planning policy around the UK. Unlike conventional paving which requires runoff collection by gulleys and pipes, concrete block permeable paving acts as the drainage system as well as supporting traffic loads. It allows water to pass through the surface – between each block - and into the underlying permeable sub-base, designed specifically for this role. Here, it is stored and released slowly, either into the ground, to the next SUDS management stage or to a drainage system, or alternatively harvested.

Hazeley School, Milton Keynes. Concrete block permeable paving in car parks treats water feeding wildlife ponds and elsewhere is used for water harvesting for toilet flushing.

As a result, permeable paving reduces the amount and rate of runoff, and removes many of the pollutants in that runoff. It can also benefit biodiversity by providing unpolluted water for wildlife, plants and trees, while eliminating the hazards that open gulleys present to wildlife.

Code Level 6 Barratt Green House (shown here) and the adjacent Level 4 Hanson EcoHouse at the BRE Innovation Park use concrete block permeable paving for rainwater harvesting.

Many of these benefits are recognized with credits in BREEAM 2008. For example, one credit is offered where SUDS are used to limit runoff from a development to that of the site's natural state and another where SUDS provide on-site treatment to minimize watercourse pollution. Credits for beneficial impacts on local ecology are also available, where permeable paving can contribute. Using permeable paving to harvest water for irrigation is also recognized with a credit, as is harvesting for toilet and urinal flushing. Some similar provisions are included in the *Code for Sustainable Homes*.

Wider sustainability issues

Although many of the on-going environmental investments and improvements made by Interpave manufacturer members are reflected in the Green Guide ratings, they also affect other sustainability issues. All Interpave block paving manufacturers have committed to the *British Precast Concrete Federation Sustainability Charter*, with wide ranging key performance indicators. They have senior managers and directors specifically tasked with executing sustainability policies and continue to explore ways of improving performance in all areas and demonstrating that performance to stakeholders. Recycling, reducing waste and responsible use of resources all form part of this ethos.

It is also worth remembering that their precast concrete paving products are manufactured locally on modern, automated manufacturing plant. Interpave manufacturers form an essential part of the local economy and community, while localisation minimises transportation impacts and provides effective national coverage. More information on sustainability issues can be found at: **www.paving.org.uk/sustain**

Another Interpave document *Planning with Paving* illustrates the extensive palette of styles, scales, textures and colours for paving blocks, flags, kerbs and related products offered by modern precast concrete paving. This impressive diversity of products is readily available throughout the country with the reassurance of predictable and consistent performance characteristics. Therefore, precast concrete is uniquely placed to provide the safe surfaces, accessibility for all and long-term durability demanded for today's sustainable communities.

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