



environmental impact of paving

THE GREEN GUIDE &
PRECAST CONCRETE PAVING
EDITION 2



Interpave

THE PRECAST CONCRETE PAVING
AND KERB ASSOCIATION



Introduction

Selecting sustainable construction materials can be a difficult challenge for specifiers, particularly with claims and counterclaims from different sides of the construction industry. However, the 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. This document summarises the Green Guide findings and ratings, focusing on precast concrete paving and updated to include additional information from the hard copy version of the Guide.

These ratings can then be applied to other environmental assessment tools for specific projects, such as *BREEAM 2011*. While the Green Guide looks just at construction elements as built, BREEAM and *The Code for Sustainable Homes* 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. These issues are discussed fully in the *Paving for Sustainability* document, available via: www.paving.org.uk/sustain

The Green Guide

The BRE *Green Guide to Specification* is an on-line tool, supported by an expanded hard copy version, 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



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. 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.

In The Green Guide, two of the paving scenarios are informed by British Standard definitions, as follows:




• Lightly Trafficked Areas

This scenario refers to BS 7533-2:2001 which covers the "usual road spectrum of axle loads up to 11,000kg and trafficked by up to 0.5 million standard axles (msa)" – generally cul-de-sacs, driveways, car parks, precincts, lightly trafficked roads and other paving.

• Heavily Trafficked Areas

This scenario refers to BS 7533-1:2001 which covers the "usual road spectrum of axle loads up to 18,000kg and trafficked by between 0.5 million standard axles (msa) and 12 msa" – generally highway vehicles.

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)	

Comparing Paving

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 CO₂ 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.

Permeable Paving and the Green Guide

Concrete block permeable paving plays an important role in SuDS which, in turn, already forms part of planning policy around the UK and will become effectively mandatory under the Flood and Water Management Act 2010 when implemented. The Green Guide recognises this role and states that: *“permeable precast concrete block paving... systems can be considered to have the same ratings as their conventional equivalents. The additional material that may be necessary for SuDS is discounted as the benefit it provides is for facilitating drainage and therefore sits outside the scope of the functional unit”*.

Using the same reasoning, the fact that recycled sub-base material cannot be used with permeable paving should also be discounted because the sub-base is also for facilitating drainage. Therefore, the 'conventional equivalents' for concrete block permeable paving should be 'concrete blocks over recycled sub-base', giving ratings of A+ for Lightly Trafficked and A for Heavily Trafficked Areas (from the previous table).

Information on the other sustainability benefits of concrete block permeable paving can be found in the *Paving for Sustainability* document, available via: www.paving.org.uk/sustain

BREEAM and the Green Guide

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. For example, *BREEAM 2011 New Construction* for non-domestic buildings includes 1 credit where at least 80% of all external hard landscaping and boundary protection (by area) achieves a Green Guide A or A+ rating. As shown in the table earlier, this is generally the case with precast concrete paving – including concrete block permeable paving.

Information on other attributes of precast concrete paving that can contribute to BREEAM credits and outcomes can be found in the *Paving for Sustainability* document, available via: www.paving.org.uk/sustain

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 plants. 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.

Further Information

www.paving.org.uk/sustain and www.thegreenguide.org.uk



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