

# Get the right concrete on site

Ensure your ready-mixed concrete is both correct for the application and quality assured

## SPECIFICATION

### Correct concrete

When it comes to ensuring the correct concrete is used for the correct application, the British Standards Institution, working with the industry, has gone a long way to simplifying the process by the use of designated concretes.

The table on the right shows a summary of the range of housing and other applications, together with the appropriate designated concrete and its recommended consistence class.

A key facet of designated concretes is that they are essentially identified by their application and by definition are fit for purpose. So a specifier has assurance that the designated concrete will provide the required performance without having to go through the complicated process of specifying a designed concrete.

This is one reason why the National House-Building Council (NHBC) requires the use of designated concretes where the concrete is to be supplied by a ready-mixed concrete producer.

The NHBC specifies the type of designated concrete required for a particular housebuilding application through its Standards [1], but it is the prerogative of the contractor to specify the required consistence (workability).

Part of the designated concrete approach is to identify a default consistence class – that is a class that will be assumed if the contractor does not specify an alternative.

For the general (GEN), reinforced (RC) and foundation (FND) concretes the default class is S3 – that is a workable mix where the producer is likely to target a value at the concrete plant that equates to mid-range on site.

For PAV concrete the default class is S2 – that is normal workability mix that requires quite a

## CONCRETE APPLICATIONS AND DESIGNATED CONCRETES

Application		Designated concrete	Recommended consistence class (Slump)	
Unreinforced foundations and associated works requiring Design Chemical Class 1 (DC-1)	Drainage works to give immediate support	GEN1	S1	
	Blinding and mass concrete fill, strip footings, mass concrete foundations, oversite below suspended slabs.	GEN1	S3*	
	Trench fill foundations	GEN1	S4	
Unreinforced foundations requiring Design Chemical classes DC-2 to DC-4	DC-2	FND2	S3*†	
	DC-2z	FND2Z		
	DC-3	FND3		
	DC-3z	FND3Z		
	DC-4	FND4		
	DC-4z	FND4Z		
DC-4m	FND4M			
General application	Kerb bedding and backing	GEN0	S1	
Floors	House floors, no embedded metal	screed or floating floor added	GEN1	S2
		no permanent finish, e.g. carpet		
	Garage floors no embedded metal		GEN2	
	Garage floors no embedded metal		GEN3	
	Wearing surface	light foot, trolley	RC25/30	
		general industrial	RC32/40	
Heavy industrial		RC40/50		
Paving	House drives and domestic parking	PAV1	S2*	
	Heavy-duty paving with rubber tyre wheels	PAV2	S2* S3‡	

\* THIS IS THE DEFAULT SLUMP CLASS  
 † THE DEFAULT SLUMP CLASS FOR TRENCH FILL  
 ‡ FOR LARGE AREAS

## SLUMP CLASSES

Specified slump class	Description of workability	Range, as measured from spot samples taken from initial discharge	
		Not less than	Not more than
S1	Stiff, can give immediate support to kerbs or drainage works	0 mm	70 mm
S2	Normal workability	30 mm	120 mm
S3	Mid-range workability. Optimum for placing, compaction and finishing	80 mm	180 mm
S4	Trench fill workability	140 mm	240 mm
S5	Very workable, but where the slump test is not a suitable measure of workability	200 mm	-

high compactive effort but is perceived as being the most suitable where the surface finish is to be applied immediately after placing and compaction.

The Concrete Society Good Concrete Guide 8 [2] entitled *Concrete Practice* includes a wealth of further guidance on the practical aspects of concreting.

Although PAV1 has a default workability class of S2, specifying S3 would make it significantly easier to place and compact and this makes the concrete less susceptible to wetting up.

PAV concretes are air-entrained and the correct distribution of bubbles to give the concrete enhanced freeze-thaw resistance properties may be compromised where there are uncontrolled additions of water on site.

### Quality assurance

An essential aspect of designated concretes is that the producer shall hold current product conformity certification based on product testing and surveillance, coupled with approval of the quality system to BS EN ISO 9001 [3] by a certification body that is accredited by the secretary of state (or equivalent).

This is a requirement of BS 8500 [4] Concrete Complementary British Standard to EN 206-1, where EN 206-1 [5] is the European Standard for Concrete.

Producers who do not have product conformity certification and claim to supply any of the designated concretes – GEN, FND, PAV or RC – may be committing an offence under the Trade Descriptions Act 1968.

In addition, where such non-conforming concrete is used for housebuilding, it may invalidate the NHBC warranty and affect the householders' structural buildings insurance.

It is easy to check if a ready-mixed concrete supplier has the required third-party accreditation, as in practical terms they will be holding certification from either the Quality Scheme for Ready-Mixed Concrete (QSRMC) or the BSI Kitemark Scheme (see far right).

In addition to Quality Assurance, many BRMCA members are also certified to the BRE Framework Standard for the Responsible Sourcing of Construction Products, BES 6001 [6].

This standard has integrated all of the activities associated with responsible sourcing, together with the delivery mechanism using certified management systems.

This provides a benchmark to compare all construction products on an equal basis and it should provide a single criterion for responsible sourcing performance



within future updates to sustainable building schemes, such as the Code for Sustainable Homes [7].

The standard allows the recognition of four levels of performance: Pass, Good, Very Good and Excellent.

The British Standard for sector certifications schemes for responsible sourcing, BS 8902 [8], was developed after BES 6001 but with time this may also provide an equivalent route for ready-mixed concrete suppliers to demonstrate that their services are responsibly sourced and accepted with the range of sustainable construction schemes.

### Summary

Having selected an accredited quality-assured supplier of ready-mixed concrete, it is very simple to ensure that the correct concrete is selected for the application using the designated route in accordance with BS 8500. This will ensure that the ready-mixed concrete will be supplied in accordance with the specification.

It is important to note that at any time a single site may be in receipt of more than one delivery of ready-mixed concrete and therefore it is essential that a contractor's supervisor checks the delivery documentation on arrival and directs the mixer truck driver to discharge in the correct location.

### References

- [1] National House-Building Council, NHBC Standards, Milton Keynes, January 2011
- [2] The Concrete Society, Good Concrete Guide 8, *Concrete*

*Practice – Guidance on the practical aspects of concreting*, November 2008

[3] British Standards Institution, BS EN ISO 9001: 2008, *Quality Management Systems, Requirements*, BSI, London, 30 November 2008

[4] British Standards Institution, BS 8500 Concrete – Complementary British Standard to BS EN 206-1 – *Part 1: 2006 Method of specifying and guidance for the specifier; Part 2: 2006 Specification for constituent materials and concrete*, BSI, London, November 2006

[5] British Standards Institution, BS EN 206 Concrete – *Part 1: 2000 Specification, performance, production and conformity*, BSI, London, February 2001, last amended 25 October 2004

[6] Building Research Establishment, BES 6001 *BRE Environmental & Sustainability Standard – Framework Standard for the Responsible Sourcing of Construction Products*, BRE Watford, Issue 2, 15 June 2009

[7] Department for Communities and Local Government, *Code for Sustainable Homes: Technical Guide*, DCLG, London, November 2010

[8] British Standards Institution, BS 8902: 2009, *Responsible sourcing sector schemes for construction products – specification*, BSI, London, October 2009

By Chris A Clear, technical director, BRMCA; Richard Hall, scheme manager, QSRMC; and John Rigg, certification technical manager, BSI

**“Select an accredited quality-assured supplier of ready-mixed concrete”**



For the list of companies holding BSI Kitemark Certification go to [www.kitemark.com](http://www.kitemark.com), click on the 'Find it' tab, enter 'BS EN 206-1 and BS 8500' into the 'Business (Company, Service or Licensee number)' box and then press 'search'.



For the list of companies holding QSRMC certification simply go to [www.qsrcm.co.uk](http://www.qsrcm.co.uk) and select 'QSRMC'.



Unless a ready-mixed concrete company holds either QSRMC or the equivalent BSI Kitemark Certification then they are not eligible to be members BRMCA.

See [www.brmca.org](http://www.brmca.org) and select 'members' for accredited ready-mixed concrete suppliers. See p23.