

INSIGHT #9 : STANDARDS AND BENCHMARKING

Concrete goes above and beyond compliance

From the extraction of raw materials through the whole supply chain to production sites, products and buildings, concrete is covered by a wide range of British and European standards, design and construction codes and Building Regulations. Some provide very specific prescriptive requirements while others are based on final performance criteria that can be achieved in many ways.

Building Regulations, structured around a range of different aspects of construction such as structural integrity, fire, thermal performance and acoustic performance, can introduce potentially conflicting requirements that need to be resolved. Added to these are the more recent schemes for the assessment and rating of the sustainability of projects such as the BREEAM suite, Code for Sustainable Homes (no longer in use for new projects), Home Quality Mark, CEEQUAL and LEED.

The concrete industry also has a role to provide fact-based information to help designers and clients. Industry experts contribute to the development of standards, codes and regulations through representation on

technical committees and working groups and by direct comment on public consultations. This is essential to ensure that innovative solutions can meet requirements and performance criteria, while continuing to deliver robust, safe and durable structures.

Although concrete manufacturers usually have technical expertise and information to support designers, the strategy recognises the need for more generic design guidance. The Concrete Centre publishes best practice guidance on general aspects of concrete construction and specific sustainability aspects including thermal mass, whole-life carbon and long-term resilience.

Over the last 10 years, the concrete industry has gone beyond simply complying with regulation, seeking to become a leader in sustainable construction. By consistently improving our performance over and above current best practice, and enlightening clients to ensure a sustainable construction environment downstream, the concrete industry plays a dynamic role in delivering a sustainable, low-carbon built environment in a socially, environmentally and economically responsible manner.

Five Pancras Square, completed in 2014, is the 150,000ft², BREEAM Outstanding headquarters for Camden council. It provides public facilities including two swimming pools and a library on the lower floors, while the upper nine storeys house office space. The building's exceptional environmental performance is underwritten by extensive use of concrete. "Using concrete is the easiest way of achieving the benefits of a large thermal mass," says Peter Fisher of architect Bennetts Associates, "so the upper nine floors are constructed from precast concrete columns and conventional in-situ concrete slab floors"

Stanton Bonna's precast concrete factory in Stanton by Dale, Ilkeston, Derbyshire, makes manhole rings for roadside drainage systems and is one of many facilities now covered by an ISO 14001-compliant environmental management system



Photo: Stanton Bonna



Photo: Hufton + Crow

93%
OF CONCRETE
INDUSTRY
PRODUCTION
SITES HAVE EMS
CERTIFICATION TO
ISO 14001



PRODUCTION SITE CERTIFICATION

An important element of the concrete industry's sustainability strategy has been the setting of targets for all members to ensure that their production sites are covered by independent (UKAS-approved) certification, such as ISO 14001 for environmental management systems (EMS) and ISO 9001 for quality management systems (QMS).

The international standard ISO 14001 is structured around identifying potential environmental impacts,

assessing their relative risk and criticality and implementing procedures to minimise and manage that risk. In 2016, 93% of all concrete and constituent material production sites operated an EMS certified to ISO 14001.

For concrete plants, the focus in the EMS will often be on avoiding pollution through control of dust emissions, spillages and run-off water and the appropriate handling and disposal of any production and consumables waste.

ISO 9001 is structured to identify aspects of raw materials supply and production process, assess their level of influence and risk on quality and fitness for purpose and the implementation of procedures to ensure consistency. In 2016, 92% of production sites were covered by a QMS certified to ISO 9001. Together with the BS OHSAS 18001 health and safety standard, these form a key part of the BRE's BES 6001 responsible sourcing standard (see page 11).



MEETING BREEAM WITH CONCRETE

BREEAM is the world's leading sustainability assessment method for masterplanning projects, infrastructure and buildings. It recognises and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use and refurbishment. There are many recent examples of new construction in the UK that have achieved Very Good, Excellent and Outstanding certification using concrete as the principle structural material.

Assessment covers a range of sustainability issues including aspects related to energy and water use, the internal environment, health and wellbeing, pollution, transport, materials, waste, ecology and management. A holistic, whole-

life approach is at the core of the assessment methodology.

Uniquely, concrete has the versatility and potential to contribute to achieving credits across a wide range of categories. Many of the credits relate to environmental performance benefits, such as durability, acoustic isolation and flood resilience, but most significantly the use of concrete's high thermal mass assists with the reduction of energy consumption and lower carbon emissions in use.

BREEAM is updated regularly in order to maintain recognition of best practice in sustainable construction, and to take into account changes in regulation and standards. The latest version of BREEAM New Construction was published in

2018, so while some projects already in progress may continue to be assessed against the 2014 Technical Manual up until 2023, new project registrations after 23 March 2018 will be assessed under this slightly amended version.

One interesting amendment in the latest version is a change to the methodology relating to the use of recycled aggregates. The credit now recognises that local aggregates may be the most sustainable source for a given location, so a new metric linking abundance with the method and distance of transportation has been introduced.

Further details on BREEAM scores can be found in Concrete and BREEAM, published by The Concrete Centre.