



Implementing Eurocode 2

Dr Pal Chana of the British Cement Association discusses the forthcoming design Eurocode and the concrete industries' efforts in preparing for the change.

The complete suite of structural Eurocodes being prepared by the Comité Européen de Normalisation (CEN), the European committee for standardisation, will be well on the way to full EN status by 2005. The primary objective of the Eurocodes is to improve the competitiveness of the European construction industry, and the professionals and industries connected with it, both within and outside the European Union. Additionally, they will form a basis for specifying all new construction, and will serve as a framework for drawing up harmonised technical specifications for construction products.

The Eurocode relating to design of concrete buildings (EN 1992-1, Eurocode 2) is expected to be published in late 2004 and to run in parallel with current British Standards for a few years before their withdrawal. Ultimately, this design standard will replace BS8110 for building design. Separate documents give the essential design information for loads, or actions. The relationship with other European design standards is shown in Figure 1.

In order for the Eurocodes to achieve their objectives and for the construction industry to derive maximum benefit, much work is needed! It is crucial that construction professionals start to become familiar with the use of Eurocodes and for university design courses to cover the new methodology, in order to familiarise the next generation of graduates.

By the time EN 1992- 1 is introduced, most engineers will need to be assured that it can be used as a practical and easy-to-use concrete design tool, in addition to producing economic results. If they are not assured of this, practices will continue to use BS 8110 in preference to adopting the new code. However, this is a short-sighted strategy because, under CEN rules, standards having the same scope must be withdrawn within five years of the relevant Eurocodes becoming available. This implies that the UK design standard BS 8110, which mirrors EN 1992-1, must be withdrawn in 2009. At that time it will be imperative to have an industry that is fully conversant with Eurocode 2. Forward-looking consultants who make the transition quickly to the Eurocode will benefit from applying the code for competitive advantage in Europe and elsewhere. The UK design code for structural concrete, BS8110, has not been maintained in anticipation of the forthcoming Eurocode, which contains more up-to-date knowledge.

The manufacturers and specifiers of concrete products also need to understand the implication of Eurocodes. These codes provide a framework for demonstrating compliance with the essential requirements in the Construction Products Directive. Concrete product standards that include structural design will need to use Eurocode 2. When a harmonised standard or European Technical Approval exists, only products with a CE marking can be placed on the market.

The transition to Eurocode 2 will be aided by the availability of necessary guidance in the form of explanatory literature, process flowcharts, spreadsheets and other design software. This guidance is needed because the general philosophy of EC2 is quite different from that found in BS 8110. Eurocode 2 makes no attempt to be a design 'guide'; it is a code giving general rules. There are no simplified tables of moment or shear factors for example, as one might expect to look for these in separate design guides or standard textbooks.

It is clear that a substantial effort is required over the next three years to ensure that the UK design profession can use Eurocode 2 with confidence. This effort is being co-ordinated by an industry grouping, Concrete Industry Eurocode 2 Group (CIEG), with wide representation including BCA, BRE, The Concrete Centre, CONSTRUCT, The Concrete Society, Ove Arup, Cadogan Tietz, Alan Baxter Associates and ODPM (Building Regulations). This group provides the means for the co-ordinated and collaborative approach required during the transition period.

To smooth the transition to EC2, the following tools are being prepared. These should be available at the same time as the predicted formal release of the new code in early 2005:

- general design guides
- worked examples to EC2
- a "Concise EC2"
- a full set of design spreadsheets
- comparative and calibration studies
- an EC2 version of "Economic Frame Elements".

British Precast is producing a Manual for Design to Eurocode 2 to cover precast construction. Thomas Telford and The Institution of Structural Engineers are updating their respective design manuals to apply to the published version of Eurocode 2. In addition, specialist software houses will need to update their programs in due time. Of prime importance will be the availability of updated finite element software, as these are increasingly being used in design, e.g. for flat slabs.

The Eurocodes have been viewed as being on a receding horizon for a long time and the level of awareness of the design Eurocodes amongst the construction professionals is low. The concrete industry needs to prepare for the change now. This transition may be a painful process at first, but can also be viewed as an opportunity.

To ensure the concrete industry benefits from implementation of Eurocodes, greater publicity is needed on:

- why Eurocodes and their supporting standards are important for the design and construction of UK structures
- objectives, use and implementation timetable
- contents of the emerging documents
- design manuals and aids.

The concrete sector is responding to the forthcoming Eurocodes through a plan of action which includes the publication of user guides, worked examples and computer software and the development of CPD courses. In order to publicise this work

programme, the CIEG partners have set up a dedicated website www.eurocode2.info. A series of workshops are also planned at different locations in the UK to raise awareness of the forthcoming Eurocode and design aids

Eurocodes offer the opportunity of harmonised design standards for the European construction market and the rest of the world. It is, therefore, important for the concrete construction industry to become familiar with the Eurocodes so that advantage can be taken of the opportunities on implementation.

Figure 1

