

# Workmanship on building sites —

## Part 2: Code of practice for concrete work —

### Section 2.2 Sitework with in situ and precast concrete

**CAWS E10, E20, E30, E40, E50**

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# Committees responsible for this British Standard

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- Building Employers' Confederation
- Chartered Institute of Building
- Consumer Policy Committee of BSI
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property Services Agency)
- Federation of Associations of Specialists and Sub-Contractors
- Institute of Clerks of Works of Great Britain Inc.
- Institution of Civil Engineers
- Institution of Structural Engineers
- National Building Specification Ltd.
- National Council of Building Materials Producers
- National House Building Council
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors
- Society of Chief Architects of Local Authorities

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## Foreword

This Section of BS 8000 has been prepared under the direction of the Council for Building and Civil Engineering. It makes recommendations and gives guidance on basic workmanship for conventional types of building work.

The recommendations given are not necessarily comprehensive; particular project documents, e.g. project specifications, may need to cover particular recommendations not dealt with by this code of practice.

This code of practice is unique in that unlike other British Standards, it draws together recommendations given in other codes of practice.

The purpose of this code of practice is to encourage good workmanship by providing the following:

- a) the most frequently required recommendations on workmanship for building work in a readily available and convenient form to those working on site;
- b) assistance in the efficient preparation and administration of contracts;
- c) recommendations on how designers' requirements for workmanship may be satisfactorily realized;
- d) definitions of good practice on building sites for supervision and for training purposes; this guidance is not to supplant the normal training in craft skills;
- e) a reference for quality of workmanship on building sites.

It is recognized that the design, procurement and project information should be conducive to good workmanship on site.

During the preparation of this code of practice the Building Industry's Co-ordinating Committee for Project Information (CCPI), produced a Common Arrangement of Work Sections (CAWS) for building work. This code of practice has generally been arranged in accordance with the Common Arrangement so that it can be used easily with project specifications and bills of quantities using this arrangement. Other major documents are being restructured in accordance with the Common Arrangement.

NOTE The CCPI was sponsored by the Association of Consulting Engineers, the Building Employers' Confederation, the Royal Institution of Chartered Surveyors and the Royal Institute of British Architects.

When complete BS 8000 will comprise the following Parts.

- *Part 1: Code of practice for excavation and filling;*
- *Part 2: Code of practice for concrete work;*
- *Part 3: Code of practice for masonry;*
- *Part 4: Code of practice for waterproofing;*
- *Part 5: Code of practice for carpentry, joinery and general fixings;*
- *Part 6: Code of practice for roof, slate, tile covering and cladding;*
- *Part 7: Code of practice for glazing;*
- *Part 8: Code of practice for plasterboard partitions and dry linings;*
- *Part 9: Code of practice for cement/sand floor screeds and concrete floor toppings;*
- *Part 10: Code of practice for plastering and rendering;*
- *Part 11: Code of practice for wall and floor tiling;*
- *Part 12: Code of practice for decorative wallcoverings and painting;*
- *Part 13: Code of practice for above ground drainage and sanitary appliances;*
- *Part 14: Code of practice for below ground drainage;*
- *Part 15: Code of practice for hot and cold water services (domestic scale).*

Technical Committees CSB/39, Structural use of concrete, and CAB/4, Concrete, have also participated in the preparation of this Section of BS 8000 and the content is based on and consistent with that of BS 8110. However, BS 8110 covers the subject matter more comprehensively and includes design, materials and other related aspects in addition to workmanship on site.

The text of this Section of BS 8000 includes commentaries. These commentaries are separately identified and are intended to be for guidance only and do not form part of the recommendations. They refer, unless otherwise stated, to the clause which immediately precedes each commentary.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.



## Subsection 1. General

### 1.1 Scope

This Section of BS 8000 gives recommendations on basic workmanship on building sites and covers those tasks which are frequently carried out in relation to sitework with in situ and precast concrete.

This Section does not cover concrete work carried out for civil engineering and other specialist applications for which reference should be made to BS 8110-1.

**NOTE** This code of practice includes supplementary elements in the form of commentaries to assist in its use and understanding. Compliance with the commentaries is not necessary in order to be able to claim conformity with the standard.

### 1.2 References

#### 1.2.1 Normative references

This Section of BS 8000 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this Section of BS 8000 only when incorporated in it by amendment or revision.

#### 1.2.2 Informative references

This Section of BS 8000 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

### 1.3 Definitions

For the purposes of this Section of BS 8000, the definitions given in BS 6100-1.3.1:1987, BS 6100-1.3.3:1987 and BS 6100-6.2:1986 apply.

## Subsection 2. Materials, handling and preparation

Caution. When cement is mixed with water, alkali is released. Take precautions to avoid dry cement entering the eyes, mouth and nose when mixing concrete. Prevent skin contact with wet cement or concrete by wearing suitable protective clothing. If cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay. Wash wet concrete off the skin immediately.

It is important to observe all aspects of safety on site. For general guidance on safety with concrete construction see "A guide for small contractors. Site safety and concrete construction" issued by the Health and Safety Executive [1].

For particular health and safety measures to be observed when handling cement and concrete see Construction Industry Advisory Committee: "Hazard information sheet I Cement" [2].

### 2.1 Checking

#### 2.1.1 General

Before discharge, check delivery tickets and certificates against the specification and examine marks and labels and condition of the material and components. If not satisfied refer to the supplier immediately.

For materials used for site mixed concrete, make reference to BS 8000-2.1. Check materials and components before installation or use and do not install or use materials that have been damaged or that have become defective whilst stored on site.

#### 2.1.2 Ready-mixed concrete

**2.1.2.1 Delivery.** Check ready-mixed concrete delivery tickets and certificates against the specification. If necessary refer to the supplier immediately. In particular check:

- a) name or number of the ready-mixed concrete depot;
- b) serial number of the ticket;
- c) date;
- d) truck number;
- e) name of the purchaser;
- f) name or location of the site;
- g) grade of concrete or mix description;
- h) specified workability;
- i) minimum cement content, if specified;
- j) type of cement;
- k) limiting proportions of ground granulated blastfurnace slag (ggbfs) or pulverized fuel ash (pfa), if specified;
- l) maximum free water/cement ratio, if specified;
- m) nominal maximum size of aggregate;

- n) type or name of admixtures, if included;
- o) quantity of concrete;
- p) time of loading or of introducing water if later than loading time;
- q) any other items that have been specified.

In cold and hot weather check the temperature of the concrete which should be not less than 5 °C nor more than 30 °C unless otherwise specified.

**2.1.2.2 Records.** Keep a record of:

- a) the time of completion of the discharge of the concrete;
- b) the location within the construction where the concrete has been placed;
- c) extra water, if any, added to the concrete.

COMMENTARY. *No water, other than the amount required to produce the specified workability should be added to the truck mixer drum before discharge, unless there are instructions to do so.*

#### 2.1.3 Steel reinforcement

Check that reinforcement is the correct steel grade and that the bending dimensions are correct.

#### 2.1.4 Precast components

Check precast components as described in 5.1.

### 2.2 Handling and site storage

#### 2.2.1 Reinforcement

- a) Avoid rough handling, shock loading and dropping from a height.
- b) Keep clean by sheeting overall if necessary.
- c) Store reinforcements off the ground on supports close enough together to prevent permanent deformation.
- d) Do not permit rust to such an extent that the effective cross-sectional area of the reinforcement is reduced to below the permissible negative tolerance. If necessary loosely cover the steel to exclude the rain; but allow good circulation of air all round the steel.
- e) Store different sizes separately from each other and ensure that they are clearly labelled.

COMMENTARY. *Dirt or grease prevents a proper bond with the concrete; any badly misshapen bars should not be re-shaped on site without the permission and supervision of the specifying authority.*

*Unless rust is so heavy as to reduce the effective cross-sectional area of the reinforcement to below the permitted negative tolerance, it is not deleterious. Loose rust is removed by normal handling and any rust left adhering to the reinforcement does not reduce the bond (see CIRIA Report 91 [3]).*