

# Workmanship on building sites —

## Part 3: Code of practice for masonry

**CAWS F10, F30**

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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 Part 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 intended to supplant the normal training in craft skills;
- e) a reference for quality of workmanship on building sites.

It is recognized that 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/33, Structural use of masonry, CAB/6, Mortar, and ECB/44, Damp-proof systems, have also participated in the preparation of this Part of BS 8000 and the content is based on and consistent with that of BS 5628. However, BS 5628 covers the subject matter more comprehensively and includes design, materials and other related aspects in addition to workmanship on site. Attention is also drawn to the BRE Report *Driving Rain Index* 1976[1].

The text of this Part of BS 8000 includes commentaries and figures. 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 20, 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.



# Section 1. General

## 1.1 Scope

This Part of BS 8000 gives recommendations on basic workmanship and covers those tasks which are frequently carried out in relation to masonry work involving brickwork and blockwork.

For design aspects of masonry reference should be made to BS 5628.

**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 Part 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 page 20. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 8000 only when incorporated in it by amendment or revision.

### 1.2.2 Informative references

This Part 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 purpose of this Part of BS 8000, the definitions given in BS 6100-1.3.1:1987 and BS 6100-5.1:1985, BS 6100-5.2:1984 and BS 6100-5.3:1984 apply.

## Section 2. Materials handling and preparation

### 2.1 Checking, handling and site storage of materials and components

#### 2.1.1 General

Keep the site clean and tidy in order that the checking, handling and storage of materials and components can be carried out speedily and effectively.

#### 2.1.2 Checking

Check delivery tickets and certificates against the specification. Examine marks and labels and the condition of materials and components. If necessary refer to the supplier immediately.

In particular check that:

- a) materials and components are clean and are not damaged or unduly wet;
- b) the colour of facing masonry units match approved samples or reference panels (for clay bricks see BS 3921);
- c) there is continuity, as far as possible, in the supply of materials and components, and particularly of sand and cement from the same source and of materials for the approved mortar mixes for facing work.

**COMMENTARY.** *The condition of masonry units at the time of delivery may impose requirements on site before use (see 2.2.2). Sand should be visually checked for cleanliness. Testing and/or certification may be called for by the specifier.*

*It is desirable that colour differences between consignments of masonry units do not result in banding or patchiness of colour in finished walling. Distributing units from different packs throughout the site will help to blend units of different colour within the consignment. Some manufacturers may be able to blend the units in their factory but this has to be ascertained in advance. Where several consignments will be delivered to site over a long period of time, blending on site may not solve the problem of colour variation between consignments. The problem should be identified before deliveries begin and the manufacturer consulted.*

*Where masonry units are delivered wrapped or banded, suitable arrangements should be made for checking them at the time of delivery.*

*Sands and cement supplied from different sources can give rise to colour variations in the mortar. This can significantly affect the appearance of walling.*

#### 2.1.3 Handling and site storage

**2.1.3.1 Masonry units.** Unload and handle masonry units with care to minimize soiling, chipping and breakage. Do not tip masonry units from the carrier without permission. Never tip facing units. Handle loads with wrapping and banding in place unless it is impractical to do so. Use mechanical handling equipment where possible.

Do not stack units directly on sulphate bearing clinker and ashes or directly on the ground. Store them in stable stacks on a prepared hardstanding area. Protect the stacks from rain and frost, and from soiling from ground and passing traffic. Protect the bottom of the stack from becoming wet from ground moisture.

Stack unwrapped masonry units so as to allow free circulation of air. In addition, follow the manufacturer's recommendations for handling and storage.

**COMMENTARY.** *If masonry units are too wet the finished work may develop efflorescence or leaching from the joints causing white stains. The risk of unacceptable shrinkage cracking, particularly with concrete blockwork and calcium silicate brickwork, is greater when units have been wetted unnecessarily because of lack of protection.*

**2.1.3.2 Ancillary components.** Handle components, e.g. lintels, flue linings, tiles, cavity closers and edge trims with care to avoid cracking, damage to edges, damage to surfaces and coatings, distortion and soiling.

Stack lintels and copings of precast concrete and pressed metal the correct way up on an adequate number of level bearers clear of the ground. Cover the stacks to protect them from staining and splashing of mud, and in accordance with any additional requirements in the manufacturer's instructions.

Store metal and plastics components, e.g. wall ties, straps etc., under cover and protect them from damage and distortion.

**2.1.3.3 Bags of cement and hydrated lime.** Where materials are to be stored for later use, unless there are small quantities only, store as follows.

- a) Store in a dry, weatherproof, frost-free, enclosed shed or building with a dry floor. If the floor is concrete, store on a timber platform.
- b) Keep different materials in separate stacks.
- c) Stack bags away from walls, not more than eight bags high. Cover stacks with tarpaulin or polyethylene sheet.
- d) Stack bags so that consignments can be used in the order of delivery.

- e) Keep cement stored on site to a practical minimum. Check materials for deterioration when taken out of storage and discard if lumpy in any way.

In the case of small quantities for immediate use, if not stored in a shed or building, stand the bags on a timber platform well clear of the ground and cover with tarpaulin or polyethylene sheet so that all the bags are wholly protected from wind and rain.

*COMMENTARY. Providing availability permits, do not order materials too early or too much at one time. Even if materials are protected from rain, moisture in the air will gradually cause their deterioration. Even in good conditions cement will eventually go lumpy and give lower strength.*

**2.1.3.4 Cement in bulk.** Store cement delivered in bulk in a proper cement silo (see BS 8000-2).

**2.1.3.5 Sand, aggregates and mortars**

- a) Store different sands, aggregates and lime/sand mixes in different stockpiles on hard clean bases which permit free drainage. Do not intermix them and avoid contamination from other building materials, debris or other deleterious material.
- b) Contain and cover factory produced pre-mixed lime/sand for mortars to prevent excessive drying out, wetting and loss of fine particles of lime and pigments.
- c) Store factory produced ready-to-use retarded mortars in covered containers to prevent excessive drying out or wetting.
- d) In frosty weather cover and protect all sands and mortars from freezing.
- e) Do not store retarded ready-to-use mortars for longer than the manufacturer's quoted period of retardation.

**2.1.3.6 Damp-proof course materials and thermal insulation.** Store damp-proof course (DPC) materials in the dry, under cover, and protect them against damage. In addition, store flexible materials as follows.

- a) Stand rolls on their ends as a stable stack not more than three packs or more than 1 m high.
- b) Ensure that bitumen and other thermoplastic materials are not in contact with any direct heat source.
- c) Since some DPC materials may become stiff in cold weather conditions, store sufficient rolls for the next day's use in a warm place overnight.
- d) Check the labels on adhesives for any storage requirements, e.g. avoidance of high or low temperature, and for any hazards relating to solvent vapours.

**2.1.3.7 Storage and handling.** In all cases follow the manufacturer's recommendations for storage and handling.

## 2.2 Preparation of work, materials and components

### 2.2.1 General

**2.2.1.1 Distributed components and materials.**

When materials and components are distributed to the work position ensure that:

- a) neither construction nor scaffolding is overloaded; obtain advice about any restrictions.
- b) their protection is maintained to prevent damage or deterioration before use.

**2.2.1.2 Setting out building.** Set out relative to securely marked or pegged reference lines and datum levels using serviceable equipment appropriate to the circumstances. Check squareness with diagonal measurements or builder's square. Securely fix datum and profile marks. Leave datum level points in positions so that a gauge rod can be used for coursing other heights such as openings, storeys and string courses (see 3.1.2).

**2.2.1.3 Setting out starting course.** Set out the starting course anticipating the positions of openings, etc. in the work above to avoid unnecessary cutting and adjustment of masonry units leading to incorrect or uneven bonding (see 3.1.3).

### 2.2.2 Masonry units

**2.2.2.1 Clay units.** In dry warm weather wet the surfaces of very absorbent bricks just sufficiently to reduce the suction. Do not overwet.

*COMMENTARY. Very dense bricks such as engineering bricks should not be wetted as they may slide on the mortar. Overwetting of any bricks may cause efflorescence or lime staining.*

**2.2.2.2 Calcium silicate units.** Allow newly manufactured units to cool before use. Protect them from rain. To achieve better adhesion and laying in dry warm weather, preferably adjust the consistency of the mortar. Alternatively, wet the surfaces to be bedded just sufficiently to reduce the suction.

*COMMENTARY. Overwetting of calcium silicate units should be avoided in order to minimize the shrinkage of the built masonry when it dries.*

**2.2.2.3 Concrete units.** Do not wet concrete units before laying them; if necessary adjust the mortar mix to accommodate units with different suction.