BRITISH STANDARD

BS 8110-1:1997

Incorporating Amendments Nos. 1, 2, 3 and 4

Structural use of concrete —

Part 1: Code of practice for design and construction

ICS 91.080.40

BSI British Standards

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee B/525, Building and civil engineering structures, to Subcommittee B/525/2, Structural use of concrete, upon which the following bodies were represented:

Association of Consulting Engineers

British Cement Association

British Precast Concrete Federation Ltd.

Concrete Society

Department of the Environment (Building Research Establishment)

Department of the Environment (Property and Buildings Directorate)

Department of Transport (Highways Agency)

Federation of Civil Engineering Contractors

Institution of Civil Engineers

Institution of Structural Engineers

Steel Reinforcement Commission

This British Standard, having been prepared under the direction of the Sector Board for Building and Civil Engineering, was published under the authority of the Standards Board and comes into effect on 15 March 1997

First published August 1985
Second edition March 1997

The following BSI references relate to the work on this standard:
Committee reference B/525/2
Draft for comment 95/105430 DC

ISBN 978 0 580 59893 7

Amendments issued since publication

Amd. No.	Date	Comments
9882	September 1998	
13468	27 May 2002	
16016	30 November 2005	Indicated by a sideline
17307	31 August 2007	See national foreword

Contents

Foreword

This part of BS 8110 has been prepared by Subcommittee B/525/2. It is a revision of BS 8110-1:1985 which is withdrawn.

BS 8110-1:1997 incorporates all published amendments made to BS 8110-1:1985.

Amendment No. 1 (AMD 5917) published on 31 May 1989;

Amendment No. 2 (AMD 6276) published on 22 December 1989;

Amendment No. 3 (AMD 7583) published on 15 March 1993;

Amendment No. 4 (AMD 7973) published on 15 September 1993.

It also includes changes made by incorporating Draft Amendments Nos. 5 and 6 to BS 8110-1:1985 issued for public comment during 1994 and 1995.

Amendment No. 1 to BS 8110-1:1997 detailed the insertion of various references to different cements used in concrete construction, covered by BS 5328 and the recommendations of BS 5328 for concrete as a material, up to the point of placing, curing and finishing in the works.

Amendment No. 2 to BS 8110-1:1997 dealt with the change of the partial safet factor for reinforcement γ_m, from 1.15 to 1.05. y

Amendment No. 3 to BS 8110-1:1997 has been necessitated through the adoption of BS 8500, *Concrete — Complementary British Standard to BS EN 206-1*, the withdrawal of BS 5328, *Concrete*, and the adoption of 500 Grade high yield steel for use in the UK

Amendment No. 3 aligns the recommendations for exposure classification and durability in BS 8110-1:1997 with those in BS 8500. Recommendations for durability have been removed from BS 8110-1:1997 and replaced with references to the appropriate guidance in BS 8500. Essential changes have been made to account for the terminology of BS 8500 (e.g. the dual cylinder/cube strength notation, and “strength classes” instead of “grades”).

The industry has agreed to adopt Grade 500 high yield steel for reinforcement in line with the common grade available in Europe. For some types of process in the manufacture of reinforcement this means that the required properties will be closer to the limits than for Grade 460. For this reason it is considered wise to increase the material factor to 1.15 until such time that there is sufficient data available to demonstrate a return to the value of 1.05 introduced by Amendment No. 2 to BS 8110-1:1997.

Where Grade 460 deformed bars are used in design, the changes to the partial safety factor for reinforcement, and the effects of these changes, referred to in Amendment No. 3 to BS 8110-1:1997 may be disregarded and a partial factor of 1.05 for such reinforcement be used.

NOTE Grade 460 deformed bars were specified and/or referred to in BS 4449:1997, BS 4482:1985, BS 4483:1998 and BS 8666:2000 which have been withdrawn and superseded by 2005 editions.

The start and finish of text introduced by Amendment No. 4 is indicated in the text by tags A4 A4.

Users of this British Standard need to note the ongoing introduction and publication of European Standards and supersession of British Standards.

It has been assumed in the drafting of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, pages 1 to 159 and a back cover.

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Sidelining in this document indicates the most recent changes by amendment.

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Section 1. General

1.1 Scope

This part of BS 8110 gives recommendations for the structural use of concrete in buildings and structures, excluding bridges and structural concrete made with high alumina cement.

The recommendations for robustness have been prepared on the assumption that all load-bearing elements, e.g. slabs, columns and walls are of concrete. In a structure where concrete elements such as floor slabs are used in conjunction with load-bearing elements of other materials, similar principles are appropriate but, when adequate robustness is provided by other means, the ties recommended by this code may not be required.

NOTE 1 Where appropriate British Standards are available for precast concrete products, e.g. kerbs and pipes, it is not intended that this code should replace their more specific requirements.

1.2 References

1.2.1 Normative references

This part of BS 8110 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 155. Subsequent amendments to, or revisions of, any of these publications apply to this part of BS 8110 only when incorporated in it by updating or revision.

1.2.2 Informative references

This Part of BS 8110 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 part of BS 8110, the following definitions apply.

1.3.1 General

1.3.1.1
design ultimate load[1)]
the design load for the ultimate limit state

1.3.1.2
design service load[1)]
the design load for the serviceability limit state

1.3.2 Terms specific to flat slabs (see **3.7**)

1.3.2.1
flat slab
a slab with or without drops and supported, generally without beams, by columns with or without column heads. It may be solid or may have recesses formed on the soffit so that the soffit comprises a series of ribs in two directions (waffle or coffered slab)

1.3.2.2
column head
local enlargement of the top of a column providing support to the slab over a larger area than the column section alone

1.3.2.3
drop
thickening of a slab in the region of a column

[1)] Design loads are obtained by multiplying the characteristic loads by the appropriate partial safety factors for loading (γ_f).