

Structural use of concrete —

Part 1: Code of practice for design and construction

ICS 91.080.40

Committees responsible for this British Standard

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 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)
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 Institution of Civil Engineers
 Institution of Structural Engineers
 Steel Reinforcement Commission

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Contents

	Page
Committees responsible	Inside front cover
Foreword	v
<hr/>	
Section 1. General	
1.1 Scope	1
1.2 References	1
1.3 Definitions	1
1.4 Symbols	3
<hr/>	
Section 2. Design objectives and general recommendations	
2.1 Basis of design	5
2.2 Structural design	5
2.3 Inspection of construction	7
2.4 Loads and material properties	8
2.5 Analysis	11
2.6 Design based on tests	12
<hr/>	
Section 3. Design and detailing: reinforced concrete	
3.1 Design basis and strength of materials	15
3.2 Structures and structural frames	18
3.3 Concrete cover to reinforcement	21
3.4 Beams	24
3.5 Solid slabs supported by beams or walls	35
3.6 Ribbed slabs (with solid or hollow blocks or voids)	45
3.7 Flat slabs	48
3.8 Columns	63
3.9 Walls	73
3.10 Staircases	78
3.11 Bases	79
3.12 Considerations affecting design details	81
<hr/>	
Section 4. Design and detailing: prestressed concrete	
4.1 Design basis	99
4.2 Structures and structural frames	100
4.3 Beams	101
4.4 Slabs	108
4.5 Columns	108
4.6 Tension members	109
4.7 Prestressing	109
4.8 Loss of prestress, other than friction losses	109
4.9 Loss of prestress due to friction	111
4.10 Transmission lengths in pre-tensioned members	113
4.11 End blocks in post-tensioned members	114
4.12 Considerations affecting design details	114
<hr/>	
Section 5. Design and detailing: precast and composite construction	
5.1 Design basis and stability provisions	121
5.2 Precast concrete construction	122
5.3 Structural connections between precast units	127
5.4 Composite concrete construction	131
<hr/>	
Section 6. Concrete, materials, specification and construction	
6.1 Materials and specification	135

6.2	Concrete construction	135
<hr/>		
Section 7. Specification and workmanship: reinforcement		
7.1	General	147
7.2	Cutting and bending	147
7.3	Fixing	147
7.4	Surface condition	147
7.5	Laps and joints	148
7.6	Welding	148
<hr/>		
Section 8. Specification and workmanship: prestressing tendons		
8.1	General	149
8.2	Handling and storage	149
8.3	Surface condition	149
8.4	Straightness	149
8.5	Cutting	149
8.6	Positioning of tendons and sheaths	150
8.7	Tensioning the tendons	150
8.8	Protection and bond of prestressing tendons	152
8.9	Grouting of prestressing tendons	153
<hr/>		
Annex A (informative) — <i>deleted</i>		154
<hr/>		
Index		157
<hr/>		
Figure 2.1	— Short term design stress-strain curve for normal-weight concrete	13
Figure 2.2	— Short term design stress-strain curve for reinforcement	13
Figure 2.3	— Short term design stress-strain curve for prestressing tendons	14
Figure 3.1	— Flow chart of design procedure	20
Figure 3.2	— Minimum dimensions of reinforced concrete members for fire resistance	23
Figure 3.3	— Simplified stress block for concrete at ultimate limit state	26
Figure 3.4	— System of bent-up bars	31
Figure 3.5	— Shear failure near supports	31
Figure 3.6	— Effective width of solid slab carrying a concentrated load near an unsupported edge	36
Figure 3.7	— Definition of panels and bays	37
Figure 3.8	— Explanation of the derivation of the coefficient of Table 3.14	42
Figure 3.9	— Division of slab into middle and edge strips	42
Figure 3.10	— Distribution of load on a beam supporting a two-way spanning slab	44
Figure 3.11	— Types of column head	50
Figure 3.12	— Division of panels in flat slabs	52
Figure 3.13	— Definition of breadth of effective moment transfer strip b_e for various typical cases	57
Figure 3.14	— Shear at slab-column connection	58
Figure 3.15	— Application of 3.7.6.2 and 3.7.6.3	59
Figure 3.16	— Definition of a shear perimeter for typical cases	60
Figure 3.17	— Zones for punching shear reinforcement	62
Figure 3.18	— Shear perimeter of slabs with openings	63
Figure 3.19	— Shear perimeters with loads close to free edge	63
Figure 3.20	— Braced slender columns	69
Figure 3.21	— Unbraced slender columns	70

Figure 3.22 — Biaxially bent column	72
Figure 3.23 — Critical section for shear check in a pile cap	82
Figure 3.24 — Simplified detailing rules for beams	95
Figure 3.25 — Simplified detailing rules for slabs	96
Figure 5.1 — Continuity of ties: bars in precast member lapped with bar in in situ concrete	123
Figure 5.2 — Continuity of ties: anchorage by enclosing links	123
Figure 5.3 — Continuity of ties: bars lapped within in-situ concrete	123
Figure 5.4 — Schematic arrangement of allowance for bearing	125
<hr/>	
Table 2.1 — Load combinations and values of γ_f for the ultimate limit state	9
Table 2.2 — Values of γ_m for the ultimate limit state	10
Table 3.1 — Strength of reinforcement	18
Table 3.2 — <i>deleted</i>	22
Table 3.3 — <i>deleted</i>	22
Table 3.4 — Nominal cover to all reinforcement (including links) to meet specified periods fire resistance	22
Table 3.5 — Design ultimate bending moments and shear forces	25
Table 3.6 — Values of the factor β_f	27
Table 3.7 — Form and area of shear reinforcement in beams	29
Table 3.8 — Values of v_c design concrete shear stress	30
Table 3.9 — Basic span/effective depth ratio for rectangular or flanged beams	33
Table 3.10 — Modification factor for tension reinforcement	34
Table 3.11 — Modification factor for compression reinforcement	35
Table 3.12 — Ultimate bending moment and shear forces in one-way spanning slabs	37
Table 3.13 — Bending moment coefficients for slabs spanning in two directions at right-angles, simply-supported on four sides	40
Table 3.14 — Bending moment coefficients for rectangular panels supported on four sides with provision for torsion at corners	41
Table 3.15 — Shear force coefficient for uniformly loaded rectangular panels supported on four sides with provision for torsion at corners	43
Table 3.16 — Form and area of shear reinforcement in solid slabs	44
Table 3.17 — Minimum thickness of structural toppings	46
Table 3.18 — Distribution of design moments in panels of flat slabs	53
Table 3.19 — Values of β for braced columns	65
Table 3.20 — Values of β for unbraced columns	65
Table 3.21 — Values of β_a	69
Table 3.22 — Values of the coefficient β	72
Table 3.23 — Maximum slenderness ratios for reinforced walls	75
Table 3.24 — Bar schedule dimensions: deduction for permissible deviations	82
Table 3.25 — Minimum percentages of reinforcement	86
Table 3.26 — Values of bond coefficient β	88
Table 3.27 — Ultimate anchorage bond lengths and lap lengths as multiples of bar size	90
Table 3.28 — Clear distance between bars according to percentage redistribution	94
Table 4.1 — Design flexural tensile stresses for class 2 members: serviceability limit state: cracking	102
Table 4.2 — Design hypothetical flexural tensile stresses for class 3 members	103

Table 4.3 — Depth factors for design tensile stresses for class 3 members	103
Table 4.4 — Conditions at the ultimate limit state for rectangular beams with pre-tensioned tendons or post-tensioned tendons having effective bond	105
Table 4.5 — Values of $V_{co}/b_v h$	107
Table 4.6 — Relaxation factors	109
Table 4.7 — Design bursting tensile forces in end blocks	114
Table 4.8 — <i>deleted</i>	116
Table 4.9 — Nominal cover to all steel to meet specified periods of fire resistance	116
Table 4.10 — Minimum cover to curved ducts	118
Table 4.11 — Minimum distance between centre-lines of ducts in plane of curvature	119
Table 5.1 — Allowances for effects of spalling at supports	126
Table 5.2 — Allowances for effects of spalling at supported members	126
Table 5.3 — Values of $\tan \alpha_f$ for concrete connections	130
Table 5.4 — Design flexural tensile stresses in in-situ concrete	132
Table 5.5 — Design ultimate horizontal shear stresses at interface	134
Table 6.1 — Minimum periods of curing and protection	137
Table 6.2 — Minimum period before striking formwork	146
List of references	155

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 safety factor for reinforcement γ_m , from 1.15 to 1.05.

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 A_4 A_4 .

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.

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 load¹⁾

the design load for the ultimate limit state

1.3.1.2

design service load¹⁾

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).