



BUILDING REGULATIONS

Part D – Structure

Building Regulations and Structural Eurocodes

From the 31st March 2010 a suite of new British Standards for structural design, based on European Standards often called Structural Eurocodes, replaced conflicting national structural design standards which have, from that date, been withdrawn by the British Standards Institution (BSI).

Structural Eurocodes

Structural Eurocodes are a set of European design standards which introduced a common technical language and a common technical culture in structural design. This facilitated the creation of an effective Internal Market within the European Union, by removing potential barriers to trade that could exist when Member States have different national design standards. The use of Structural Eurocodes is expected to contribute towards widened and improved competitiveness of the European construction industry.

There are ten Eurocodes made up of 58 Parts that are being adopted in all EU Member States in 2010. Each Part is implemented nationally with a National Annex. These Annexes contain information on Nationally Determined Parameters to be used for the design of building and civil engineering works to be constructed in

the country concerned, addressing for example particular national safety parameters, geographical and climatic conditions, and procedures.

Under an agreement between the European standardisation bodies, national standards bodies, including the BSI for the UK, will withdraw any conflicting national structural design standards from April 2010. A withdrawn British Standard will still be available, however, it will no longer be supported by the BSI. This means that, within British Standards, current levels of safety in structural design will not be updated as knowledge increases, e.g. the effects climate change may have on wind and snow loading.

ANNEX A provides a list of the new BS EN structural design standards, and the corresponding British Standards which will be withdrawn by BSI.

Compliance with the Building Regulations

The Building (Amendment) Regulations (Northern Ireland) 2010, which introduced revised requirements relating to structural safety and came into operation on 31st March 2010, recognises both British Standards and Structural Eurocodes as a way of satisfying the requirements of Regulations D1 and D2.

Application of deemed-to-satisfy requirements

Withdrawn British Standards continue to be given deemed-to-satisfy status, however, when demonstrating compliance with the Building

Regulations, designers must consider the appropriate use of relevant standards within the circumstances of the building work.

Designers will need to be aware of the risk of inappropriately mixing new BS EN design standards and withdrawn BS design standards.

Future changes to Part D

Following on from the revisions to primary legislation enacted by the Building Regulations (Amendment) Act (NI) 2009, the Department is preparing for the move from deemed-to-satisfy to a guidance based system of demonstrating compliance with the building regulations. Future amendments to Part D and supporting guidance will not refer to withdrawn British Standards but will only cite Structural Eurocodes.

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ANNEX A

List of British Standard BS EN codes for structural design and the corresponding British Standards to be withdrawn

EUROCODE : BASIS OF STRUCTURAL DESIGN	CORRESPONDING BRITISH STANDARD
BS EN 1990:2002 Basis of structural design	–
Note: Some sections of EN 1990 correspond with BS 5268-1 , BS 5628-1*, BS 5950-1* and BS 8110-1 and BS 8110-2 .	

EUROCODE 1: ACTIONS ON STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1991-1-1:2002 Actions on structures. General actions. Densities, self-weight, imposed loads for buildings.	BS 6399-1, BS 6399-3 , BS 648*
BS EN 1991-1-2:2002 Actions on structures. General actions. Actions on structures exposed to fire.	–
BS EN 1991-1-3:2003 Actions on structures. General actions. Snow loads.	BS 6399-3
BS EN 1991-1-4:2005 Actions on structures. General actions. Wind actions	BS 6399-2 , BS 5400-2*
BS EN 1991-1-5:2003 Actions on structures. General actions. Thermal actions Note: Some sections of EN 1991-1-5 relating to bridges correspond to BS 5400-2*.	–
BS EN 1991-1-6:2005 Actions on structures. General actions. Actions during execution.	–
BS EN 1991-1-7:2006 Actions on structures. General actions. Accidental actions.	Minimal recommendations in BS 6399-1. Some sections of EN 1991-1-7 correspond with BS 6399-1, BS 5268-1*, BS 5628-1*, BS 5950-1*, BS 8110-1, BS 8110-2 and BS 5400-3*.
BS EN 1991-2:2003 Actions on structures. Traffic loads on bridges.	BS 5400-2*
BS EN 1991-3:2006 Actions on structures. Actions induced by cranes and machines.	–
BS EN 1991-4:2006 Actions on structures. Silos and tanks.	–

EUROCODE 2: DESIGN OF CONCRETE STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1992-1-1:2004 Design of concrete structures. General rules and rules for buildings.	BS 8110-1, BS 8110-2, BS 8110-3
BS EN 1992-1-2:2004 Design of concrete structures. General rules. Structural fire design.	BS 8110-1, BS 8110-2
BS EN 1992-2:2005 Design of concrete structures. Concrete bridges. Design and detailing rules.	BS 5400-4*, BS 5400-7*, BS 5400-8*
BS EN 1992-3:2006 Design of concrete structures. Liquid retaining and containing structures.	BS 8007*

EUROCODE 3: DESIGN OF STEEL STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1993-1-1:2005 Design of steel structures. General rules and rules for buildings.	BS 5950-1, BS 5400-3*
BS EN 1993-1-2:2005 Design of steel structures. General rules. Structural fire design.	BS 5950-8*
BS EN 1993-1-3:2006 Design of steel structures. General rules. Supplementary rules for cold-formed members and sheeting.	BS 5950-5, BS 5950-6*, BS 5950-9*
BS EN 1993-1-4:2006 Design of steel structures. General rules. Supplementary rules for stainless steels.	–
BS EN 1993-1-5:2006 Design of steel structures. Plated structural elements.	BS 5950-1, BS 5400-3*
BS EN 1993-1-6:2007 Design of steel structures. General. Strength and stability of shell structures.	–
BS EN 1993-1-7:2007 Design of steel structures. Plated structures subject to out of plane loading.	–
BS EN 1993-1-8:2005 Design of steel structures. Design of joints.	BS 5950-1. BS 4604-1*, BS 4604-2*, BS 5400-3*
BS EN 1993-1-9:2005 Design of steel structures. Fatigue.	BS 5950-1, BS 5400-10*
BS EN 1993-1-10:2005 Design of steel structures. Material toughness and through-thickness properties.	BS 5950-1, BS 5400-3*

BS EN 1993-1-11:2006 Design of steel structures. Design of structures with tension components.	–
BS EN 1993-1-12:2007 Design of steel structures. Additional rules for the extension of EN 1993 to steel grades S700.	BS 5950-1
BS EN 1993-2:2006 Design of steel structures. Steel bridges.	BS 5400-3*
BS EN 1993-3-1:2007 Design of steel structures. Towers, masts and chimneys. Towers and masts.	BS 8100-1*, BS 8100-2*, BS 8100-3*, BS 8100-4*
BS EN 1993-3-2:2008 Design of steel structures. Towers, masts and chimneys. Chimneys.	BS 4076*
BS EN 1993-4-1:2007 Design of steel structures. Silos, tanks and pipelines. Silos.	–
BS EN 1993-4-2:2007 Design of steel structures. Silos, tanks and pipelines. Tanks.	–
BS EN 1993-4-3:2007 Design of steel structures. Silos, tanks and pipelines. Pipelines.	–
BS EN 1993-5:2007 Design of steel structures. Piling.	BS 5950-1
BS EN 1993-6:2007 Design of steel structures. Crane supporting structures.	BS 5950-1 , BS 2853*

EUROCODE 4: DESIGN OF COMPOSITE STEEL AND CONCRETE STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1994-1-1:2004 Design of composite steel and concrete structures. General rules and rules for buildings.	BS 5950-3.1, BS 5950-4
BS EN 1994-1-2:2005 Design of composite steel and concrete structures. General rules. Structural fire design.	BS 5950-8*
BS EN 1994-2:2005 Design of composite steel and concrete structures. General rules and rules for bridges.	BS 5400-5*

EUROCODE 5: DESIGN OF TIMBER STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1995-1-1:2004 Design of timber structures. General. Common rules and rules for buildings.	BS 5268-2, BS 5268-3, BS 5268-6.1*, BS 5268-6.2*, BS 5268-7.1*, BS 5268-7.2*, BS 5268-7.3*, BS 5268-7.4*, BS 5268-7.5*, BS 5268-7.6*, BS 5268-7.7*
BS EN 1995-1-2:2004 Design of timber structures. General. Structural fire design.	BS 5268-4.1*, BS 5268-4.2*
BS EN 1995-2:2004 Design of timber structures. Bridges.	—

EUROCODE 6: DESIGN OF MASONRY STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1996-1-1:2005 Design of masonry structures. General rules for reinforced and unreinforced masonry structures.	BS 5628-1, BS 5628-2
BS EN 1996-1-2:2005 Design of masonry structures. Structural fire design.	BS 5628-3
BS EN 1996-2:2006 Design of masonry structures. Design considerations, selection of materials and execution of masonry.	BS 5628-3
BS EN 1996-3:2006 Design of masonry structures. Simplified calculation methods for unreinforced masonry structures.	—

EUROCODE 7: GEOTECHNICAL DESIGN	CORRESPONDING BRITISH STANDARD
BS EN 1997-1:2004 Geotechnical design. General rules.	BS 8002*, BS 8004*, BS 8006*, BS 8081*
BS EN 1997-2:2007 Geotechnical design. Ground investigation and testing.	—

EUROCODE 8: DESIGN OF STRUCTURES FOR EARTHQUAKE RESISTANCE	CORRESPONDING BRITISH STANDARD
BS EN 1998-1:2004 Design of structures for earthquake resistance. General rules. Seismic actions for buildings.	—
BS EN 1998-2:2005+Amendment 1:2009 Design of structures for earthquake resistance. Bridges.	—
BS EN 1998-3:2005 Design of structures for earthquake resistance. Assessment and retrofitting of buildings.	—
BS EN 1998-4:2006 Design of structures for earthquake resistance. Silos tanks and pipelines.	—
BS EN 1998-5:2004 Design of structures for earthquake resistance. Foundations, retaining structures and geotechnical aspects.	—
BS EN 1998-6:2005 Design of structures for earthquake resistance. Towers masts and chimneys.	—

EUROCODE 9: DESIGN OF ALUMINIUM STRUCTURES	CORRESPONDING BRITISH STANDARD
BS EN 1999-1-1:2007 Design of aluminium structures. General rules.	BS 8118-1, BS 8118-2
BS EN 1999-1-2:2007 Design of aluminium structures. General. Structural fire design.	—
BS EN 1999-1-3:2007 Design of aluminium structures. Additional rules for structures susceptible to fatigue.	BS 8118-1
BS EN 1999-1-4:2007 Design of aluminium structures. Supplementary rules for trapezoidal sheeting.	—
BS EN 1999-1-5:2007 Design of aluminium structures. Supplementary rules for shell structures.	BS 8118-1

References shown in bold type are currently given deemed-to-satisfy status in the Table to Regulation D3(1)(a) in Schedule 4 (Structural loadings) or Table D in Schedule 5 of the Building Regulations (Northern Ireland) 2000 (as amended). Standards shown thus * are not currently referenced in Building Regulations. Some standards may not be applicable to Part D (Structure) for example BS 5400 for bridges.