BS 8002:2015

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Code of practice for earth retaining structures

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 96, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 June 2015. It was prepared by Technical Committee B/526, *Geotechnics*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

Together with BS EN 1997-1:2004+A1:2013, this British Standard supersedes BS 8002:1994, which is withdrawn.

Relationship with other publications

BS 8002 gives non-contradictory, complementary information for use with BS EN 1997 and its UK National Annexes.

Information about this document

This is a full revision of the standard, which introduces the following principal changes:

- the revised text is fully compatible with the current version of Eurocode 7 (BS EN 1997);
- guidance is given on designing earth retaining structures according to limit state principles using partial factors;
- guidance is given on the selection of design parameters for soils;
- guidance is given on model factors to be applied to prop loads determined by calculation;
- the revised text reflects advances in earth retaining structure technology over the past 30 years.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

The word "should" is used to express recommendations of this standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Contractual and legal considerations

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.

1 Scope

This British Standard gives recommendations for the design and construction of earth retaining structures to support ground at slopes steeper than the ground would naturally assume. It provides non-contradictory, complementary information for use in conjunction with BS EN 1997 and its UK National Annex.

Clause **4** gives general recommendations for the design and construction of all types of earth retaining structures; Clause **5**, Clause **6**, and Clause **7** give specific recommendations for the design and construction of gravity walls, semi-gravity walls, and embedded walls (respectively); and Clause **8** gives specific recommendations for the design and construction of cofferdams, basements, and strutted excavations.

Annex A gives specific recommendations for the design and construction of deadman anchors.

Annex B gives information about specific geological formations encountered in the UK.

NOTE 1 This standard does not cover the design and construction of anchors (other than deadman anchors), for which see BS 8081.

NOTE 2 This standard does not cover the design and construction of earthworks, for which see BS 6031.

NOTE 3 This standard does not cover the design and construction of foundations, for which see BS 8004.

NOTE 4 This standard does not cover the design and construction of maritime works, for which see BS 6349.

NOTE 5 This standard does not cover the design and construction of earth retaining structures constructed using strengthened or reinforced soil walls, for which see BS 8006.

2 Normative references

Standards publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 65, *Specification for vitrified clay pipes, fittings and ducts, also flexible mechanical joints for use solely with surface water pipes and fittings*

BS 437, *Specification for cast iron drain pipes, fittings and their joints for socketed and socketless systems*

BS 4449, *Steel for the reinforcement of concrete – Weldable reinforcing steel – Bar, coil and decoiled product – Specification*

BS 4660, *Thermoplastics ancillary fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage*

BS 4729, *Clay and calcium silicate bricks of special shapes and sizes – Recommendations*

BS 4962, *Specification for plastics pipes and fittings for use as subsoil field drains*

BS 5480, *Specification for glass reinforced plastics (GRP) pipes, joints and fittings for use for water supply or sewerage*

BS 5481, *Specification for unplasticized PVC pipe and fittings for gravity sewers*

BS 5642-2, *Sills, copings and cappings – Part 2: Specification for copings and cappings of precast concrete, cast stone, clayware, slate and natural stone*

BS 5837, *Trees in relation to design, demolition and construction – Recommendations*

BS 5911 (all parts), *Concrete pipes and ancilliary concrete products*

BS 5930, *Code of practice for site investigation*

BS 5975, *Code of practice for temporary works procedures and the permissible stress design of falsework*

BS 6031:2009, *Code of practice for earthworks*

BS 6349 (all parts), *Maritime works* [1)]

BS 8004:2015, *Code of practice for foundations*

BS 8006-1:2010, *Code of practice for strengthened/reinforced soils and other fills*

BS 8006-2, *Code of practice for strengthened/reinforced soils – Part 2: Soil nail design*

BS 8081, *Code of practice for ground anchors*

BS 8102, *Code of practice for protection of below ground structures against water from the ground*

BS 8215, *Code of practice for design and installation of damp-proof courses in masonry construction*

BS 8417, *Preservation of wood – Code of practice*

BS 8500-1:2015, *Concrete – Complementary British Standard to BS EN 206-1 – Part 1: Method of specifying and guidance for the specifier*

BS 8500-2 [2)], *Concrete – Complementary British Standard to BS EN 206-1 – Part 2: Specification for constituent materials and concrete*

BS 10175, *Investigation of potentially contaminated sites – Code of practice*

BS EN 206:2013, *Concrete – Specification, performance, production and conformity*

BS EN 295 (all parts), *Vitrified clay pipe systems for drains and sewers*

BS EN 335:2013, *Durability of wood and wood-based products – Use classes: definitions, application to solid wood and wood-based products*

BS EN 350-2, *Durability of wood and wood-based products – Natural durability of solid wood – Part 2: Guide to the natural durability of and treatability of selected wood species of importance in Europe*

BS EN 351-1, *Durability of wood and wood-based products – Preservative-treated solid wood – Part 1: Classification of preservative penetration and retention*

BS EN 460, *Durability of wood and wood-based products – Natural durability of solid wood – Guide to the durability requirements for wood to be used in hazard classes*

BS EN 598, *Ductile iron pipes, fittings, accessories and their joints for sewerage applications – Requirements and test methods*

BS EN 771-1, *Specification for masonry units – Part 1: Clay masonry units*

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1) Specific references are made to the following part: BS 6349-2:2010, *Maritime works – Part 2: General – Code of practice for the design of quay walls, jetties and dolphins*

2) Informative reference is made to BS 8500-2:2015.

BS EN 771-2, *Specification for masonry units – Part 2: Calcium silicate masonry units*

BS EN 771-3, *Specification for masonry units – Part 3: Aggregate concrete masonry units*

BS EN 771-4, *Specification for masonry units – Part 4: Autoclaved aerated concrete masonry units*

BS EN 771-5, *Specification for masonry units – Part 5: Manufactured stone masonry units*

BS EN 771-6, *Specification for masonry units – Part 6: Natural stone masonry units*

BS EN 845-1, *Specification for ancillary components for masonry – Part 1: Wall ties, tension straps, hangers and brackets*

BS EN 1401 (all parts), *Plastic piping systems for non-pressure underground drainage and sewerage*

BS EN 1536, *Execution of special geotechnical works – Bored piles* [3)]

BS EN 1538, *Execution of special geotechnical works – Diaphragm walls* [4)]

BS EN 1852-1, *Plastics piping systems for nonpressure underground drainage and sewerage – Polypropylene (PP) – Part 1: Specifications for pipes, fittings and the system*

BS EN 1916, *Concrete pipes and fittings, unreinforced, steel fibre and reinforced*

BS EN 1990:2002+A1:2005, *Eurocode – Basis of structural design*

BS EN 1991, *Eurocode 1: Actions on structures* [5)]

BS EN 1992 (all parts), *Eurocode 2: Design of concrete structures* [6)]

BS EN 1993 (all parts), *Eurocode 3: Design of steel structures* [7)]

BS EN 1995 (all parts), *Eurocode 5: Design of timber structures* [8)]

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3) Informative reference is made to BS EN 1536:2010.

4) Informative reference is made to BS EN 1538:2010.

5) Specific references are made to the following parts:
- BS EN 1991-1-1:2002, *Eurocode 1: Actions on structures – Part 1-1:Densities, self-weight, imposed loads for buildings;*
- BS EN 1991-1-6:2005, *Eurocode 1: Actions on structures – Part 1-6: General actions – Actions during execution;*
- BS EN 1991-2:2003, *Eurocode 1: Actions on structures – Part 2: Traffic loads on bridges.*

6) Specific references are made to the following parts:
- BS EN 1992-1-1:2004+A1:2014, *Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings;*
- BS EN 1992-3, *Eurocode 2: Design of concrete structures – Part 3: Liquid retaining and containing structures.*

7) Specific references are made to the following parts:
- BS EN 1993-1-1, *Eurocode 3: Design of steel structures – Part 1-1: General rules and rules for buildings*;
- BS EN 1993-5, *Eurocode 3: Design of steel structures – Part 5: Piling*.

8) Specific references are made to the following part: BS EN 1995-1-1, *Eurocode 5: Design of timber structures – Part 1-1: General – Common rules and rules for buildings.*

BS EN 1996 (all parts), *Eurocode 6: Design of masonry structures* [9)]

BS EN 1997-1:2004+A1:2013, *Eurocode 7: Geotechnical design – Part 1: General rules*

BS EN 1997-2:2007, *Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing*

BS EN 10025, *Hot rolled products of structural steels*

BS EN 10080, *Steel for the reinforcement of concrete – Weldable reinforcing steel – General*

BS EN 10210, *Hot finished structural hollow sections of non-alloy and fine grain steels*

BS EN 10218-1:2012, *Steel wire and wire products – General – Part 1: Test methods*

BS EN 10218-2:2012, *Steel wire and wire products – General – Part 2: Wire dimensions and tolerances*

BS EN 10219, *Cold formed welded structural hollow sections of non-alloy and fine grain steels*

BS EN 10223-3:2013, *Steel wire and wire products for fencing and netting – Part 3: Hexagonal steel wire mesh products for civil engineering purposes*

BS EN 10223-8:2013, *Steel wire and wire products for fencing and netting – Part 8: Welded mesh gabion products*

BS EN 10244-2:2009, *Steel wire and wire products – Non-ferrous metallic coatings on steel wire – Part 2: Zinc or zinc alloy coatings*

BS EN 10245-1, *Steel wire and wire products – Organic coatings on steel wire – Part 1: General Rules*

BS EN 10245-2, *Steel wire and wire products – Organic coatings on steel wire – Part 2: PVC finished wire*

BS EN 10245-3, *Steel wire and wire products – Organic coatings on steel wire – Part 3: PE coated wire*

BS EN 10245-5, *Steel wire and wire products – Organic coatings on steel wire – Part 5: Polyamide coated wire*

BS EN 10248, *Hot rolled sheet piling of non alloy steels*

BS EN 10249, *Cold formed sheet piling of non alloy steels*

BS EN 12063, *Execution of special geotechnical work – Sheet pile walls*

BS EN 12666-1, *Plastics piping systems for non-pressure underground drainage and sewerage – Polyethylene (PE) – Part 1: Specifications for pipes, fittings and the system*

BS EN 13369, *Common rules for precast concrete products*

BS EN 13670, *Execution of concrete structures*

BS EN 14199, *Execution of special geotechnical works – Micropiles*

BS EN 15258, *Precast concrete products – Retaining wall elements*

[9)] Specific references are made to the following parts:
- BS EN 1996-1-1, *Eurocode 6: Design of masonry structures – Part 1-1: General rules for reinforced and unreinforced masonry structures;*
- BS EN 1996-2, *Eurocode 6: Design of masonry structures – Part 2: Design considerations, selection of materials and execution of masonry.*