

**BS 8006-1:2010+A1:2016**



**BSI Standards Publication**

# **Code of practice for strengthened/reinforced soils and other fills**

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**Summary of pages**

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## Foreword

### Publishing information

This part of BS 8006 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 October 2010. It was prepared by Subcommittee B/526/4, *Strengthened/reinforced soils and other fills*, under the authority of B/526, *Geotechnics*. A list of organizations represented on this committee can be obtained on request to its secretary.

### Supersession

BS 8006-1:2010+A1:2016 supersedes BS 8006-1:2010, which is withdrawn.

### Relationship with other publications

The use of reinforcement in soils has become an accepted technique for the construction of retaining walls, steep slopes and basal strengthening. This code of practice has been revised and updated to include information about new methods of soil reinforcement and to bring the document in line with BS EN 1997-1:2004, NA to EN 1997-1:2004 and BS EN 14475:2006. Reinforced soil techniques are now used extensively for a range of design lives and service requirements and are still in an active stage of development, particularly as far as the use of polymeric materials is concerned.

### Information about this document

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**.

### Use of this document

This code of practice embodies the experience of engineers successfully engaged on the design and construction of the particular class of works. It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

A code of practice represents good practice at the time it is written and, inevitably, technical developments will render parts of it obsolescent in time. It is the responsibility of engineers concerned with the design and construction of works to remain conversant with developments in good practice, which have taken place since publication of the code.

As a code of practice, this part of BS 8006 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 part of BS 8006 is expected to be able to justify any course of action that deviates from its recommendations.

### Presentational conventions

The provisions in 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.*

### **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.**



# Section 1: General

## 1.1 Scope

This British Standard contains recommendations and guidance for the application of reinforcement techniques to soils, as fill or in situ, and to other fills. The standard is written in a limit state format and guidelines are provided in terms of partial material factors and load factors for various applications and design lives.

This code is to be read in conjunction with BS EN 1997-1:2004, NA to BS EN 1997-1:2004 and BS EN 14475:2006.

BS EN 1997-1:2004 does not cover the design and execution of reinforced soil structures. The values of partial factors and load factors given in BS EN 1997-1:2004 have not been calibrated for reinforced soil structures. BS EN 1997-1:2004 is not for use in the design and execution of reinforced soil. The partial factors set out in BS 8006-1 cannot be replaced by similar factors in BS EN 1997-1:2004.

The code is divided into eight sections. Section 1 identifies the scope, definitions and notation of the code. Section 2 describes the concepts and fundamental principles of reinforced soil. Section 3 provides recommendations for the use of materials where existing standards are available. Where materials are used that are not covered by existing standards or where known materials are to be used in ways not covered by existing standards Section 4 gives recommendations for the testing and approval of such materials.

Sections 5 to 8 relate to design, construction and maintenance of walls and abutments, slopes and foundations. They include specific recommendations for characterization of the soils to be used and other factors affecting the design and performance of the structures. Emphasis is placed on quality control both with regard to the consistency of the properties of the fill and reinforcing materials and to the handling of the materials on site.

In line with current practice the design methods described are based on limit state principles. The partial factors included are based on previous experience and have been calibrated to maintain consistency with current practice.

The clauses are supplemented by a substantial list of references to enable the user to consider in greater depth the applications of the technique.

## 1.2 Normative references

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

BS 1377-3, *Methods of test for soils for civil engineering purposes – Chemical and electro-chemical tests*

BS 1377-7, *Methods of test for soils for civil engineering purposes – Shear strength tests (total stress)*

BS 1377-8, *Methods of test for soils for civil engineering purposes – Shear strength tests (effective stress)*

- BS 1377-9, *Methods of test for soils for civil engineering purposes – In-situ tests*
- BS 1449-1, *Steel plate, sheet and strip – Specification for carbon and carbon-manganese plate, sheet and strip*
- BS 2569, *Control cable fittings and turnbarrels – Technical specification*
- BS 3416, *Specification for bitumen-based coatings for cold application, suitable for use in contact with potable water*
- BS 3692:2001, *ISO metric precision hexagon bolts, screws and nuts – Specification*
- BS 4147, *Specification for bitumen-based hot-applied coating materials for protecting iron and steel, including suitable primers where required*
- BS 4164, *Specification for coal-tar-based hot-applied coating materials for protecting iron and steel, including a suitable primer*
- BS 4449:2005, *Steel for the reinforcement of concrete – Weldable reinforcing steel – Bar, coil and decoiled product – Specification*
- BS 5930:1999+A1:2007, *Code of practice for site investigations*
- BS 6349, *Maritime structures*
- BS 7263-1:2001, *Precast concrete flags, kerbs, channels, edgings and quadrants – Part 1: Precast, unreinforced concrete paving flags and complementary fittings – Requirements and test methods*
- BS EN 771-3:2003+A1:2005, *Specification for masonry units – Part 3: Aggregate concrete masonry units (dense and light-weight aggregates)*
- BS EN 1990:2002+A1:2005, *Eurocode – Basis of structural design*
- BS EN 1997-1:2004, *Eurocode 7: Geotechnical design – Part 1: General rules*
- BS EN 1997-2, *Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing*
- BS EN 10025-2:2004, *Hot rolled products of structural steels – Part 2: Technical delivery conditions for non-alloy structural steels*
- BS EN 10080:2005, *Steel for the reinforcement of concrete – Weldable reinforcing steel – General*
- BS EN 12225, *Geotextiles and geotextile-related products – Method for determining the microbiological resistance by a soil burial test*
- BS EN 12878, *Pigments for the colouring of building materials based on cement and/or lime – Specifications and methods of test*
- BS EN 14475:2006, *Execution of special geotechnical works – Reinforced fill*
- BS EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods*
- BS EN ISO 10319, *Geotextiles – Wide-width tensile test*
- BS EN ISO 10320, *Geotextiles and geotextile-related products – Identification on site*
- BS EN ISO 10321, *Geosynthetics – Tensile test for joints/seams by wide-width strip method*