



SLOVENSKI STANDARD

oSIST prEN 1997-3:2022

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Evrokod 7 - Geotehnično projektiranje - 3. del: Geotehnične konstrukcije

Eurocode 7 - Geotechnical design - Part 3: Geotechnical structures

Eurocode 7 - Entwurf, Berechnung und Bemessung in der Geotechnik - Teil 3: Geotechnische Bauwerke

Eurocode 7 - Calcul géotechnique - Partie 3 : Constructions géotechniques

Ta slovenski standard je istoveten z: **prEN 1997-3**

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Eurocode 7 - Geotechnical design - Part 3: Geotechnical structures

Eurocode 7 - Calcul géotechnique - Partie 3 :
Constructions géotechniques

Eurocode 7 - Entwurf, Berechnung und Bemessung in
der Geotechnik - Teil 3: Geotechnische Bauwerke

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 250.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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prEN 1997-3:2022 (E)**European foreword**

This document (prEN 1997-3:2022) has been prepared by Technical Committee CEN/TC 250 “Structural Eurocodes”, the secretariat of which is held by BSI. CEN/TC 250 is responsible for all Structural Eurocodes and has been assigned responsibility for structural and geotechnical design matters by CEN.

This document is currently submitted to the CEN Enquiry.

This document will partially supersede EN 1997-1:2004.

The first generation of EN Eurocodes was published between 2002 and 2007. This document forms part of the second generation of the Eurocodes, which have been prepared under Mandate M/515 issued to CEN by the European Commission and the European Free Trade Association.

The Eurocodes have been drafted to be used in conjunction with relevant execution, material, product and test standards, and to identify requirements for execution, materials, products and testing that are relied upon by the Eurocodes.

The Eurocodes recognise the responsibility of each Member State and have safeguarded their right to determine values related to regulatory safety matters at national level through the use of National Annexes.

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0 Introduction

0.1 Introduction to the Eurocodes

The Structural Eurocodes comprise the following standards generally consisting of a number of Parts:

- *EN 1990 Eurocode: Basis of structural and geotechnical design*
- *EN 1991 Eurocode 1: Actions on structures*
- *EN 1992 Eurocode 2: Design of concrete structures*
- *EN 1993 Eurocode 3: Design of steel structures*
- *EN 1994 Eurocode 4: Design of composite steel and concrete structures*
- *EN 1995 Eurocode 5: Design of timber structures*
- *EN 1996 Eurocode 6: Design of masonry structures*
- *EN 1997 Eurocode 7: Geotechnical design*
- *EN 1998 Eurocode 8: Design of structures for earthquake resistance*
- *EN 1999 Eurocode 9: Design of aluminium structures*
- New parts are under development, e.g. Eurocode for design of structural glass.

The Eurocodes are intended for use by designers, clients, manufacturers, constructors, relevant authorities (in exercising their duties in accordance with national or international regulations), educators, software developers, and committees drafting standards for related product, testing and execution standards.

NOTE Some aspects of design are most appropriately specified by relevant authorities or, where not specified, can be agreed on a project-specific basis between relevant parties such as designers and clients. The Eurocodes identify such aspects making explicit reference to relevant authorities and relevant parties.

0.2 Introduction to EN 1997 Eurocode 7

EN 1997 consists of a number of parts: [log/standards/sist/402824f3-8ad7-466d-abb2-96dd0c44b0a1/osist-pr-en-1997-3-2022](https://standards.iteh.ai/catalog/standards/sist/402824f3-8ad7-466d-abb2-96dd0c44b0a1/osist-pr-en-1997-3-2022)

- EN 1997-1, *Geotechnical design — Part 1: General rules*
- EN 1997-2, *Geotechnical design — Part 2: Ground properties*
- EN 1997-3, *Geotechnical design — Part 3: Geotechnical structures*

EN 1997 standards establish additional principles and requirements to those given in EN 1990 for the safety, serviceability, robustness, and durability of geotechnical structures.

Design and verification in EN 1997 (all parts) are based on the partial factor method or other reliability-based methods, prescriptive rules, testing, or the observational method.

0.3 Introduction to prEN 1997-3

This document establishes principles and requirements for the design and verification of the following of geotechnical structures, including temporary geotechnical structures: slopes, cuttings, embankments, shallow foundation, piled foundation and retaining structures.

This document establishes principles and requirements for the design and verification of supporting elements: anchors, reinforcing element in reinforced fill structures, soil nails, rock bolts and facing.

This document establishes principles and requirements for the design and verification of groundwater control including reduction of hydraulic conductivity, dewatering and infiltration, and the use of impermeable barriers

prEN 1997-3:2022 (E)**0.4 Verbal forms used in the Eurocodes**

The verb “shall” expresses a requirement strictly to be followed and from which no deviation is permitted in order to comply with the Eurocodes.

The verb “should” expresses a highly recommended choice or course of action. Subject to national regulation and/or any relevant contractual provisions, alternative approaches could be used/adopted where technically justified.

The verb “may” expresses a course of action permissible within the limits of the Eurocodes.

The verb “can” expresses possibility and capability; it is used for statements of fact and clarification of concepts.

0.5 National Annex for prEN 1997-3

National choice is allowed in this standard where explicitly stated within notes. National choice includes the selection of values for Nationally Determined Parameters (NDPs).

The national standard implementing prEN 1997-3:2022 can have a National Annex containing all national choices to be used for the design of buildings and civil engineering works to be constructed in the relevant country.

When no national choice is given, the default choice given in this standard is to be used.

When no national choice is made and no default is given in this standard, the choice can be specified by a relevant authority or, where not specified, agreed for a specific project by appropriate parties.

National choice is allowed in prEN 1997-3:2022 through notes to the following:

Table 4.1 (NDP)	Table 4.2 (NDP)	Table 5.1 (NDP)	Table 5.2 (NDP)
Table 5.3 (NDP)	Table 6.1 (NDP)	Table 6.2 (NDP)	Table 6.3 (NDP)
Table 6.4 (NDP)	Table 6.5 (NDP)	Table 6.6 (NDP)	Table 6.7 (NDP)
Formula (6.18)	Table 7.1 (NDP)	Table 8.1 (NDP)	Table 8.2 (NDP)
Table 8.3 (NDP)	Table 9.1 (NDP)	Table 9.2 (NDP)	Table 9.3 (NDP)
Table 10.1 (NDP)	Table 10.2 (NDP)	Table 10.3 (NDP)	Table 10.4 (NDP)
Table 10.5 (NDP)	Table 11.1 (NDP)	Table 11.2 (NDP)	Table 11.3 (NDP)
Table 11.4 (NDP)	Table 11.5 (NDP)	Table 12.1 (NDP)	A.1(1) NOTE 1
G.1(1) NOTE 1			

National choice is allowed in prEN 1997-3:2022 on the application of the following informative annexes.

Annex A	Annex B	Annex C	Annex D
Annex E	Annex F	Annex G	

The National Annex can contain, directly or by reference, non-contradictory complementary information for ease of implementation, provided it does not alter any provisions of the Eurocodes.

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prEN 1997-3:2022 (E)**1 Scope****1.1 Scope of prEN 1997-3**

(1) This document provides specific rules to be applied for design and verification of geotechnical structures.

1.2 Assumptions

(1) This document is intended to be used in conjunction with prEN 1990:2021, which establishes principles and requirements for the safety, serviceability, robustness, and durability of structures, including geotechnical structures, and other construction works.

(2) This document is intended to be used in conjunction with prEN 1997-1:2022, which provides general rules for design and verification of geotechnical structures.

(3) This document is intended to be used in conjunction with prEN 1997-2:2022, which gives provisions rules for determining ground properties from ground investigation.

(4) This document is intended to be used in conjunction with the other Eurocodes for the design of geotechnical structures, including temporary geotechnical structures.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE See the Bibliography for a list of other documents cited that are not normative references, including those referenced as recommendations (i.e. in 'should' clauses), permissions ('may' clauses), possibilities ('can' clauses), and in notes.

EN 1537, *Execution of special geotechnical works — Ground anchors*

prEN 1990:2021, *Eurocode — Basis of structural and geotechnical design*

prEN 1992 (all parts), *Eurocode 2 — Design of concrete structures*

prEN 1993 (all parts), *Eurocode 3 — Design of steel structures*

prEN 1993-1-1:2022, *Eurocode 3 — Design of steel structures — Part 1-1: General rules and rules for buildings*

EN 1993-5:2007, *Eurocode 3 — Design of steel structures — Part 5: Piling*

prEN 1994 (all parts), *Eurocode 4 — Design of composite steel and concrete structures*

prEN 1995 (all parts), *Eurocode 5 — Design of timber structures*

prEN 1996 (all parts), *Eurocode 6 — Design of masonry structures*

prEN 1997-1:2022, *Eurocode 7 — Geotechnical design — Part 1: General rules*

prEN 1997-2:2022, *Eurocode 7 — Geotechnical design — Part 2: Ground properties*

- EN 10025 (all parts), *Hot rolled products of structural steel*
- EN 10080, *Steel for the reinforcement of concrete — Weldable reinforcing steel — General*
- EN 10244-2:2009, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 2: Zinc or zinc alloy coatings*
- EN 10245-2, *Steel wire and wire products — Organic coatings on steel wire — Part 2: PVC finished wire*
- EN 10245-3, *Steel wire and wire products — Organic coatings on steel wire — Part 3: PE coated wire*
- EN 10245-4, *Steel wire and wire products — Organic coatings on steel wire — Part 4: Polyester coated wire*
- EN 10245-5, *Steel wire and wire products — Organic coatings on steel wire — Part 5: Polyamide coated wire*
- EN 13738, *Geotextiles and geotextile-related products — Determination of pullout resistance in soil*
- EN 14475:2006, *Execution of special geotechnical works — Reinforced fill*
- EN 14488-4, *Testing sprayed concrete — Part 4: Bond strength of cores by direct tension*
- EN 14488-5, *Testing sprayed concrete — Part 5: Determination of energy absorption capacity of fibre reinforced slab specimens*
- EN 14490, *Execution of special geotechnical works — Soil nailing*
- EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods (ISO 1461)*
- EN ISO 12957-1, *Geosynthetics — Determination of friction characteristics — Part 1: Direct shear test (ISO 12957-1)*
- EN ISO 12957-2, *Geosynthetics — Determination of friction characteristics — Part 2: Inclined plane test (ISO 12957-2)*
- EN ISO 10319, *Geosynthetics — Wide-width tensile test (ISO 10319)*
- EN ISO 22477-5, *Geotechnical investigation and testing — Testing of geotechnical structures — Part 5: Testing of grouted anchors (ISO 22477-5)*

3 Terms, definitions, and symbols

3.1 Terms and definitions

For purposes of this document, the following terms and definitions apply.

3.1.1 Common terms used in prEN 1997-3

3.1.1.1

foundation

construction for transmitting forces to the supporting ground

[SOURCE: ISO 6707-1:2020]

prEN 1997-3:2022 (E)**3.1.1.2****deep foundation**

foundation consisting of a pile or caisson that transfers loads below the surface stratum to a deeper stratum or series of strata at a range of depths

3.1.1.3**caisson**

hollow construction with substantial impervious walls that comprises one or more cells and is sunk into the ground or water to form the permanent shell of a deep foundation

[SOURCE: ISO 6707-1:2020]

3.1.1.4**frost heave**

swelling of soil due to formation of ice within it

[SOURCE: ISO 6707-1:2020]

3.1.1.5**ground heave**

upward movement of the ground caused by either failure in the ground or by deformations due to stress relief, creep, or swelling

3.1.1.6**secondary compression**

slow deformation of soil and rock mass because of prolonged pressure and stress; synonym for 'creep' in fine soils

3.1.1.7**competent rock**

rock with sufficient strength and stiffness to withstand applied actions without failure or any significant permanent movement

3.1.2 Terms relating to slopes, cuttings, and embankments**3.1.2.1****earth-structure**

civil engineering structure, made of fill material or as a result of excavation

3.1.2.2**cut**

void that results from excavation of the ground

3.1.2.3**cutting**

earth-structure created by excavation of the ground

3.1.2.4**cut slope**

slope that results from excavation

3.1.2.5**embankment**

earth-structure formed by the placement of fill

3.1.2.6**embankment slope**

slope that results from the placement of fill

3.1.2.7**earthworks**

civil engineering process that modifies the geometry of ground surface, by creating stable and durable earth-structures

3.1.2.8**excavation**

result of removing material from the ground

3.1.2.9**levee**

embankment for preventing flooding

3.1.2.10**load transfer platform**

layer of coarse fill constructed with or without reinforcing element used to spread the load from an overlying structure such as a spread foundation, raft or embankment to improved ground or piles

3.1.3 Terms relating to spread foundations**3.1.3.1****spread foundation**

foundation that transmits forces to the ground mainly by compression on its base

3.1.3.2**footing**

stepped construction that spreads the load at the foot of a wall or column

[SOURCE: ISO 6707-1:2020]

3.1.3.3**pad foundation**

spread foundation with usually rectangular or circular footprint

3.1.3.4**strip foundation**

long, narrow, usually horizontal foundation

[SOURCE: ISO 6707-1:2020]

3.1.3.5**raft foundation**

spread foundation in the form of a continuous structural concrete slab that extends over the whole base of a structure

[SOURCE: ISO 6707-1:2020]