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**Eurocode 7 - Grondmechanisch ontwerp - Deel 1 : Algemene regels**

*Eurocode 7 - Geotechnical design - Part 1 : General rules*

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EUROPEAN PRESTANDARD

ENV 1997-1

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

October 1994

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Descriptors: soils, computation, buildings codes, rules of calculation

English version

## **Eurocode 7: Geotechnical design - Part 1: General rules -**

Eurocode 7: Calcul géotechnique - Partie 1:  
Règles générales

Eurocode 7: Entwurf, Berechnung und Bemessung  
in der Geotechnik - Teil 1: Allgemeine Regeln

This European Prestandard (ENV) was approved by CEN on 1993-05-25 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into an European Standard (EN).

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# **CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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## Foreword

### 1 Objectives of the Eurocodes

(1) The structural Eurocodes comprise a group of standards for the structural and geotechnical design of buildings and civil engineering works.

(2) They are intended to serve as reference documents for the following purposes:

- (a) As a means to prove compliance of building and civil engineering works with the essential requirements of the Construction Products Directive (CPD)
- (b) As a framework for drawing up harmonised technical specifications for construction products.

(3) They cover execution and control only to the extent that is necessary to indicate the quality of the construction products, and the standard of the workmanship, needed to comply with the assumptions of the design rules.

(4) Until the necessary set of harmonised technical specifications for products and for methods of testing their performance is available, some of the Structural Eurocodes cover some of these aspects in informative annexes.

### 2 Background to the Eurocode programme

(1) The Commission of the European Communities (CEC) initiated the work of establishing a set of harmonised technical rules for the design of building and civil engineering works which would initially serve as an alternative to the different rules in force in the various Member States and would ultimately replace them. These technical rules became known as the "Structural Eurocodes".

(2) In 1990, after consulting their respective Member States, the CEC transferred work of further development, issue and updates of the Structural Eurocodes to CEN and the EFTA Secretariat agreed to support the CEN work.

(3) CEN Technical Committee CEN/TC 250 is responsible for all Structural Eurocodes.

### 3 Eurocode programme

(1) Work is in hand on the following Structural Eurocodes, each generally consisting of a number of parts:

- EN 1991 Eurocode 1 Basis of design and 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 alloy structures

(2) Separate sub-committees have been formed by CEN/TC 250 for the various Eurocodes listed above.

(3) This part of the Structural Eurocode for Geotechnical design which had been finalised and approved for publication under the direction of CEC, is being issued by CEN as a European Prestandard (ENV) with an initial life of three years.

(4) This Prestandard is intended for experimental practical application in the design of the building and civil engineering works covered by the scope as given in 1.1.2 and for the submission of comments.

(5) After approximately two years CEN members will be invited to submit formal comments to be taken into account in determining future action.

(6) Meanwhile, feedback and comments on this Prestandard should be sent to the Secretariat of sub-committee CEN/TC250/SC7 at the following address:

NNI  
P.O.Box 5059  
NL-2600 GB Delft  
The Netherlands

or to a national standards organisation.

#### 4 National application documents

(1) In view of the responsibilities of authorities in member countries for the safety, health and other matters covered by the essential requirements of the CPD, certain safety elements in this ENV have been assigned indicative values which are identified by [ ]. The authorities in each member country are expected to assign definitive values to these safety elements.

(2) Many of the supporting standards, including those giving values for actions to be taken into account and measures required for fire protection, will not be available by the time this Prestandard is issued. It is therefore anticipated that a National Application Document giving definitive values for safety elements, referencing compatible supporting standards and giving national guidance on the application of this Prestandard will be issued by each Member State or its Standard Organisation. This Prestandard should be used in conjunction with the National Application Document valid in the country where the building and civil engineering works is to be constructed.

It is intended that this Prestandard is used in conjunction with the NAD valid in the country where the building or civil engineering works are located.

#### 5 Matters specific to this prestandard

(1) The scope of eurocode 7 is defined in 1.1.1 and the scope of this Part of eurocode 7 is defined in 1.1.2. Additional Parts of Eurocode 7 which are planned are indicated in 1.1.3; these will cover additional technologies or applications, and will complement and supplement this Part.

(2) In using this Prestandard in practice, particular regard should be paid to the underlying assumptions and conditions given in 1.3.

(3) The nine chapters of this Prestandard are complemented by seven annexes which have informative status.

## Section 1 GENERAL

### 1.1 Scope

#### 1.1.1 Scope of Eurocode 7

(1)P This prestandard applies to the geotechnical aspects of the design of buildings and civil engineering works. It is subdivided into various separate parts. See 1.1.2 and 1.1.3.

(2)P This prestandard is concerned with the requirements for strength, stability, serviceability and durability of the structures. Other requirements, e.g. concerning thermal or sound insulation, are not considered.

(3)P This prestandard shall be used in conjunction with ENV 1991-1 "Basis of Design" of Eurocode 1 "Basis of Design and Actions on Structures" which establishes the principles and requirements for safety and serviceability, describes the basis for design and verification and gives guidelines for related aspects of structural reliability.

(4)P This prestandard gives the rules to calculate actions originating from the ground such as earth pressures. Numerical values of actions on buildings and civil engineering works to be taken into account in the design are provided in ENV 1991 Eurocode 1 "Basis of Design and Actions on Structures" applicable to the various types of construction.

(5)P In this prestandard execution is covered to the extent that is necessary to indicate the quality of the construction materials and products which should be used and the standard of workmanship on site needed to comply with the assumptions of the design rules. Generally, the rules related to execution and workmanship are to be considered as minimum requirements which may have to be further developed for particular types of buildings or civil engineering works and methods of construction.

(6)P This prestandard does not cover the special requirements of seismic design. Eurocode 8, "Design provisions for earthquake resistance of structures" provides additional rules for seismic design which complete or adapt the rules of this prestandard.

#### 1.1.2 Scope of ENV 1997-1

(1)P This prestandard gives a general basis for the geotechnical aspects of the design of buildings and civil engineering works.

(2)P The following subjects are dealt with in ENV 1997-1 Eurocode 7 "Geotechnical design".

Section 1: General

Section 2: Basis of Geotechnical Design

Section 3: Geotechnical Data

Section 4: Supervision of Construction, Monitoring and Maintenance

Section 5: Fill, Dewatering, Ground Improvement and Reinforcement

Section 6: Spread Foundations

Section 7: Pile Foundations  
Section 8: Retaining Structures  
Section 9: Embankments and Slopes

### 1.1.3 Further Parts of Eurocode 7

(1)P This prestandard will be supplemented by further Parts which will complete or adapt it for particular aspects of special types of buildings and civil engineering works, special methods of construction and certain other aspects of design which are of general practical importance.

### 1.2 References

This European Prestandard incorporates by dated or undated reference, provisions from other standards. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Prestandard only when incorporated in it by amendment or revision.

ISO 1000:1981	SI-units and Recommendations for the use of their multiples and of certain other units
ISO 3898:1987	Bases for design of structures. Notations. General symbols

### 1.3 Distinction between Principles and Application Rules

(1)P Depending on the character of the individual clauses, distinction is made in this prestandard between Principles and Application Rules.

(2)P The Principles comprise:

- general statements and definitions for which there is no alternative, as well as;
- requirements and analytical models for which no alternative is permitted unless specifically stated.

(3)P The Principles are preceded by the letter P.

(4)P The Application Rules are examples of generally recognized rules which follow the Principles and satisfy their requirements.

(5)P It is permissible to use alternative rules different from the Application Rules given in this Eurocode, provided it is shown that the alternative rules accord with the relevant Principles.

### 1.4 Assumptions

(1)P The following assumptions apply:

- data required for design are collected, recorded and interpreted;
- structures are designed by appropriately qualified and experienced personnel;
- adequate continuity and communication exist between the personnel involved in data- collection, design and construction;
- adequate supervision and quality control is provided in factories, in plants, and on site;