National Standards Authority of Ireland

**ENV 1997-1:1994**

ICS 91.080.01

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# EUROCODE 7: GEOTECHNICAL DESIGN –

# PART 1: GENERAL RULES

*This Irish Standard was published under the authority of the National Standards Authority of Ireland and comes into effect on:*



**Price Code AC**

Údarás um Chaighdeáin Náisiúnta na hÉireann

# IRISH NATIONAL APPLICATION DOCUMENT

# FOR

# EUROCODE 7 : GEOTECHNICAL DESIGN-

# PART 1 : GENERAL RULES (ENV 1997-1:1994)

OCTOBER 1995.

# IRISH NATIONAL APPLICATION DOCUMENT

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# EUROCODE 7 : GEOTECHNICAL DESIGN-

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Contents Page

## SCOPE

This document is intended to provide the minimum additional information required to permit the application of Eurocode 7 : Geotechnical Design - Part 1:General Rules (ENV-1997-1:1994).

The NAD is intended to provide an opportunity to apply the ENV in an experimental way and the philosophy adopted in Ireland is to accept the ENV with the minimum of modification subject to satisfaction of the Building Regulations and regulations appropriate to other types of structures.

NB
Attention is drawn to the fact that the administrative procedures normally used on Irish projects may not satisfy the requirements of this Eurocode. Specific requirements are contained in clauses 2.8, 3.4 and 4.1 covering, inter alia, the Geotechnical Design Report, the Ground Investigation Report and Supervision, Monitoring and Maintenance. It is suggested that, during the ENV period, particular attention be paid to these requirements with a view to ascertaining their contractual and legal significance.

## 1 FIELD OF APPLICATION

This part of Eurocode 7 is intended to be used for the geotechnical aspects of the design of buildings and civil engineering works (see clause 1.1.2 of ENV 1997-1).

## 2 CLARIFICATIONS AND ADDITIONAL REQUIREMENTS.

2.1 Values of $\phi_d$

For ease of design, the following table gives $\phi_d$ values corresponding to $\phi_k$ values for use with design cases A,B and C in accordance with clause 2.4.2(15)

| $\phi_k$ | $\phi_d$ Case A | $\phi_d$ Case B | $\phi_d$ Case C |
|---|---|---|---|
| 28 | 25.8 | 28 | 23.0 |
| 30 | 27.7 | 30 | 24.8 |
| 32 | 29.6 | 32 | 26.6 |
| 34 | 31.5 | 34 | 28.4 |
| 36 | 33.4 | 36 | 30.2 |
| 38 | 35.4 | 38 | 32.0 |
| 40 | 37.3 | 40 | 33.9 |

2.2 Foundation settlement limits

Clause 2.4.6(7) limits total settlements to 50mm but normal strip and pad footings are to be designed for a total settlement of 25mm.

EUROPEAN PRESTANDARD

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

**ENV 1997-1**

October 1994

ICS 91.060.00; 91.120.20

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

English version

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

Eurocode 7: Calcul geotechnique - 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).

CEN members are required to announce the existance of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

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

**Central Secretariat: rue de Stassart,36 B-1050 Brussels**



Ref. No. ENV 1997-1:1994 E

## Contents

## 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, "Designprovisions 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