



# SLOVENSKI STANDARD SIST ENV 1996-1-3:2004

01-september-2004

9i fcWcXY\* . Dfc Y\_hfUb Y\_njXUb] \_cbgfi \_Vj^E'%' "XY. Gd`cýbUdfUj ]UnUghUj VY  
E`DcXfcVbUdfUj ]UnUVc bc`cVhÿVc

Eurocode 6: Design of masonry structures - Part 1-3: General rules for buildings -  
Detailed rules on lateral loading

Eurocode 6: Bemessung und Konstruktion von Mauerwerksbauten Teil 1-3: Allgemeine  
Regeln -Detaillierte Regeln bei horizontaler Belastung

Eurocode 6: Calcul des ouvrages en maçonnerie - Partie 1-3: Regles générales - Regles  
particulieres pour les charges latérales

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Ta slovenski standard je istoveten z: **ENV 1996-1-3:1998**

### ICS:

91.010.30	V^@ã}ãããã	Technical aspects
91.080.30	Zidane konstrukcije	Masonry

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EUROPEAN PRESTANDARD  
 PRÉNORME EUROPÉENNE  
 EUROPÄISCHE VORNORM

**ENV 1996-1-3**

June 1998

ICS 91.010.30; 91.080.30

Descriptors: buildings, construction, masonry work, computation, building codes, detail specification, loads : forces

English version

**Eurocode 6: Design of masonry structures - Part 1-3: General  
 rules for buildings - Detailed rules on lateral loading**

Eurocode 6: Calcul des ouvrages en maçonnerie - Partie 1-3: Règles générales - Règles particulières pour les charges latérales

Eurocode 6: Bemessung und Konstruktion von Mauerwerksbauten Teil 1-3: Allgemeine Regeln - Detaillierte Regeln bei horizontaler Belastung

This European Prestandard (ENV) was approved by CEN on 26 March 1998 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 a European Standard.

CEN members are required to announce the existence 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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

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## Foreword

### 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 cover execution and control only to the extent that it is necessary to indicate the quality of the construction products, and the standard of workmanship needed on and off site to comply with the assumptions of the design rules.
- (3) Until the necessary set of harmonized technical specifications for products and for the methods for testing their performance are available, some of the Structural Eurocodes cover some of these aspects in informative annexes.

### Background of the Eurocode programme

(4) The Commission of the European Communities (CEC) initiated the work of establishing a set of harmonized 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.

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

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

### Eurocode programme

(7) 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.

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EN 1998 Eurocode 8 : Design of structures for earthquake resistance.

EN 1999 Eurocode 9 : Design of aluminium alloy structures.

- (8) Separate sub-committees have been formed by CEN/TC250 for the various Eurocodes listed above.
- (9) This Part 1-3 of ENV 1996 is being published as a European Prestandard (ENV) with an initial life of three years.
- (10) This prestandard is intended for experimental application and for the submission of comments.
- (11) After approximately two years, CEN members will be invited to submit formal comments to be taken into account in determining future actions.
- (12) Meanwhile feedback and comments on this prestandard should be sent to the Secretariat of CEN/TC 250/SC6 at the following address:-

DIN

Burggrafenstrasse 6

10772 Berlin

Germany

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or to your national standards organization.

**National Application Documents (NADs)**

- (13) In view of the responsibilities of authorities in member countries for safety, health and other matters covered by the essential requirements of the Construction Products Directive (CPD), certain safety elements in this ENV have been assigned indicative values which are identified by  ("boxed values"). The authorities in each member country are expected to review the "boxed values" and may substitute alternative definitive values for these safety elements for use in national application.
- (14) Some of the supporting European or International standards may not be available by the time this prestandard is issued. It is therefore anticipated that a National Application Document (NAD) giving any substitute definitive values for safety elements, referencing compatible supporting standards and providing guidance on the national application of this prestandard, will be issued by each member country or its standards organisation.
- (15) It is intended that this prestandard is used in conjunction with the NAD valid in the country where the building and civil engineering work is located.

**Matters specific to this prestandard**

- (16) The scope of Eurocode 6 is defined in clause 1.1.1 of ENV 1996-1-1 and the scope of this Part of Eurocode 6 is defined in clause 1.1 of this Part 1-3 of ENV 1996. Additional parts of Eurocode 6 which are planned are indicated in clause 1.1.3 of ENV 1996-1-1.
- (17) This Part 1-3 of ENV 1996 will replace clauses 4.6.2 and 4.6.4 of ENV 1996-1-1.
- (18) It is intended that the basis of design referred to in Section 2 of ENV 1996-1-1 and the materials referred to in Section 3 of ENV 1996-1-1 will also apply to this Part 1-3 of ENV 1996 and that the structural detailing and construction will be in accordance with Sections 5 and 6 of ENV 1996-1-1.

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**1 General**

**1.1 Scope**

(1)P This Part 1-3 of ENV 1996 deals with the design of unreinforced masonry walls subjected to lateral wind loads and horizontal accidental loads (other than seismic actions) and shall be used in conjunction with ENV 1996-1-1.

Note: Reinforced masonry walls subjected to lateral loading can be designed using the relevant rules for reinforced masonry design in ENV 1996-1-1 and so are not covered again in this Part. The rules in Annex A are applicable only for unreinforced masonry.

(2) This Part 1-3 of ENV 1996 gives Principles and Application Rules (see clause 1.2 in ENV 1996-1-1) for designing structures for specified requirements in respect of the aforementioned functions and levels of performance.

(3) This Part 1-3 of ENV 1996 applies only to those masonry structures, or parts thereof, that are described in ENV 1996-1-1 and ENV 1996-2 and are designed accordingly.

**1.2 Normative references**

(1) This European prestandard incorporates by dated or undated reference, provisions from other publications; see ENV 1996-1-1: 1995 for a list of normative references.

**1.3 Definitions**

(1) Where appropriate, the definitions given in ENV 1996-1-1 apply.

**1.4 Symbols**

(1) Symbols used in this Part 1-3 of ENV 1996 are as follows:

- d deflection of arch under design lateral load;
- $f_k$  characteristic compressive strength of masonry;
- $f_{xd}$  design flexural strength of masonry;
- $f_{xk}$  characteristic flexural strength of masonry;
- $f_{xk1}$  characteristic flexural strength of masonry with the plane of failure parallel to the bed joints;
- $f_{xk2}$  characteristic flexural strength of masonry with the plane of failure perpendicular to the bed joints;
- h clear height of a wall;
- L length of a panel between supports or between a support and a free edge;



- $M_d$  design moment applied to a wall;
- $M_{Rd}$  design moment of lateral resistance of a wall;
- $n_a$  design axial load per unit length of wall;
- $q_{lat}$  design lateral strength per unit area of wall;
- $t$  thickness of wall or leaf;
- $W_k$  characteristic value of wind action;

Note: including negative and positive pressures, as relevant to the load case.

- $Z$  section modulus;
- $\alpha$  bending moment coefficient;
- $\gamma_Q$  partial safety factor for imposed actions;
- $\gamma_M$  partial safety factor for material properties;
- $\mu$  ratio of characteristic flexural strength  $f_{cx1}$  divided by  $f_{cx2}$ ;
- $\sigma_{dp}$  design permanent vertical stress.

## 1.5 Units

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- (1)P SI units shall be used in conformity with ISO 1000.

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## 2 Basis of design

### 2.1 General

(1)P The basis of design shall be in accordance with the principles given in Section 2 of ENV 1996-1-1.

### 2.2 Actions

(1)P The characteristic wind action,  $W_k$ , shall be taken as the wind load calculated in accordance with ENV 1991-2-4.

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### 3 Materials

#### 3.1 General

(1)P The materials used in masonry walls shall be in accordance with Section 3 of ENV 1996-1-1.

#### 3.2 Characteristic flexural strength of unreinforced masonry

(1)P The characteristic flexural strength of unreinforced masonry,  $f_{xk}$ , shall be determined in accordance with clause 3.6.4 of ENV 1996-1-1.

#### 3.3 Design flexural strength of masonry

(1)P The design flexural strength of masonry shall be taken as the characteristic strength divided by the appropriate partial safety factor  $\gamma_M$ .

(2) The design flexural strength of masonry is given by :-

$$f_{xd} = \frac{f_{xk}}{\gamma_M} \quad (3.1)$$

where  $\gamma_M$  has the appropriate value given in clause 2.3.3.2 of ENV 1996-1-1.

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