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SIST EN 1993-5:2007

Evrokod 3 - Projektiranje jeklenih konstrukcij - 5. del: Pilotiranje

Eurocode 3 - Design of steel structures - Part 5: Piling

Eurocode 3 - Bemessung und Konstruktion von Stahlbauten - Teil 5: Pfähle und Spundwände

Eurocode 3 - Calcul des structures en acier - Partie 5: Pieux et palplanches

Ta slovenski standard je istoveten z: prEN 1993-5

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NORME EUROPÉENNE
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Will supersede EN 1993-5:2007

English Version

Eurocode 3 - Design of steel structures - Part 5: Piling

Eurocode 3 - Calcul des structures en acier - Partie 5:
Pieux et palplanches

Eurocode 3 - Bemessung und Konstruktion von
Stahlbauten - Teil 5: Pfähle und Spundwände

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.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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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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European foreword

This document (prEN 1993-5:2023) 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 supersede EN 1993-5:2007.

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 recognize 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 1993 (all parts)

EN 1993 (all parts) applies to the design of buildings and civil engineering works in steel. It complies with the principles and requirements for the safety and serviceability of structures, the basis of their design and verification that are given in EN 1990 – Basis of structural and geotechnical design.

EN 1993 (all parts) is concerned only with requirements for resistance, serviceability, durability and fire resistance of steel structures. Other requirements, e.g. concerning thermal or sound insulation, are not covered.

EN 1993 is subdivided in various parts:

EN 1993-1, *Design of steel structures — Part 1: General rules and rules for buildings;*

EN 1993-2, *Design of steel structures — Part 2: Bridges;*

EN 1993-3, *Design of steel structures — Part 3: Towers, masts and chimneys;*

EN 1993-4, *Design of steel structures — Part 4: Silos and tanks;*

EN 1993-5, *Design of steel structures — Part 5: Piling;*

EN 1993-6, *Design of steel structures — Part 6: Crane supporting structures*;

EN 1993-7, *Design of steel structures — Part 7: Sandwich panels* (under preparation).

EN 1993-1 in itself does not exist as a physical document, but comprises the following 14 separate parts, the basic part being EN 1993-1-1:

EN 1993-1-1, *Design of steel structures — Part 1-1: General rules and rules for buildings*;

EN 1993-1-2, *Design of steel structures — Part 1-2: Structural fire design*;

EN 1993-1-3, *Design of steel structures — Part 1-3: Cold-formed members and sheeting*;

NOTE Cold-formed hollow sections supplied according to EN 10219 (all parts) are covered in EN 1993-1-1.

EN 1993-1-4, *Design of steel structures — Part 1-4: Stainless steel structures*;

EN 1993-1-5, *Design of steel structures — Part 1-5: Plated structural elements*;

EN 1993-1-6, *Design of steel structures — Part 1-6: Strength and stability of shell structures*;

EN 1993-1-7, *Design of steel structures — Part 1-7: Plate assemblies with elements under transverse loads*;

EN 1993-1-8, *Design of steel structures — Part 1-8: Joints*;

EN 1993-1-9, *Design of steel structures — Part 1-9: Fatigue*;

EN 1993-1-10, *Design of steel structures — Part 1-10: Material toughness and through-thickness properties*;

EN 1993-1-11, *Design of steel structures — Part 1-11: Tension components*;

EN 1993-1-12, *Design of steel structures — Part 1-12: Additional rules for steel grades up to S960*;

EN 1993-1-13, *Design of steel structures — Part 1-13: Rules for beams with large web openings*;

EN 1993-1-14, *Design of steel structures — Part 1-14: Design assisted by finite element analysis* (under preparation).

All subsequent parts EN 1993-1-2 to EN 1993-1-14 treat general topics that are independent from the structural type like structural fire design, cold-formed members and sheeting, stainless steels, plated structural elements, etc.

All subsequent parts numbered EN 1993-2 to EN 1993-7 treat topics relevant for a specific structural type like steel bridges, towers, masts and chimneys, silos and tanks, piling, crane supporting structures, etc. EN 1993-2 to EN 1993-7 refer to the generic rules in EN 1993-1 and supplement, modify or supersede them, where relevant.

0.3 Introduction to EN 1993-5

EN 1993-5 gives design rules for steel sheet piling and bearing piles to supplement the generic rules in EN 1993-1. The focus in EN 1993-5 is on design rules that supplement, modify or supersede the equivalent provisions given in EN 1993-1

EN 1993-5 is intended to be used with Eurocodes EN 1990 - Basis of structural and geotechnical design, EN 1991 - Actions on structures and EN 1997 - Geotechnical Design.

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.

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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 EN 1993-5

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 EN 1993-5 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 the relevant authority or, where not specified, agreed for a specific project by the relevant parties.

National choice is allowed in prEN 1993-5 through notes to the following:

4.1.3 (2)	4.6.1 (2)	4.6.2 (2)	5.2.6 (1)
6.4.1 (1)	6.4.4 (1)	7.4. (2)	8.2 (1)
8.2 (2)	8.2 (3)	8.3.1 (2)	8.11.2 (1)
9.4 (4)			

National choice is allowed in EN 1993-5 on the application of the following informative annexes:

Annex F

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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1 Scope

1.1 Scope of EN 1993-5

- (1) EN 1993-5 provides rules for structural design of bearing piles and sheet piles made of steel.
- (2) EN 1993-5 provides rules for the structural design of steel elements for foundations and retaining structures constructed using steel piles.
- (3) EN 1993-5 is applicable to:
- steel piled foundations for civil engineering works on land and over water;
 - temporary or permanent structures needed to carry out steel piling work;
 - temporary and permanent retaining structures made of continuous steel piling.
- (4) EN 1993-5 does not apply to:
- offshore platforms;
 - dolphins;
 - ground reinforcing elements.

NOTE Ground reinforcing elements include rock bolts; soil nails; sprayed concrete; wire mesh and facing elements.

- (5) EN 1993-5 does not cover the following aspects:

- geotechnical design;
- seismic design.

NOTE 1 For geotechnical design see prEN 1997 (all parts).

NOTE 2 For the effects of ground movement caused by earthquakes see EN 1998.

- (6) EN 1993-5 provides methods for design by calculation and for design assisted by testing.

1.2 Assumptions

- (1) Unless specifically stated, EN 1990, EN 1991 (all parts), EN 1993-1 (all parts) and EN 1997 (all parts) apply.
- (2) The design methods given in EN 1993-5 are applicable if
- the execution quality for steel piles is as specified in EN 12063, EN 12699, EN 14199 and
 - the execution quality for associated steel elements (such as bracing, anchors, waling, etc.) is as specified in EN 1090-2, EN 1537 and
 - the execution quality for concreting of bearing piles is as specified in EN 1536 and
 - the construction materials and products used are as specified in the relevant parts of EN 1993 (all parts), or in the relevant material and product specifications.

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(3) The methods for design by calculation apply only within the stated ranges of material properties and geometric proportions, for which sufficient experience and test evidence is available. These limitations do not apply to design assisted by testing.

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 1090-2, *Execution of steel structures and aluminium structures — Part 2: Technical requirements for steel structures*

EN 1536, *Execution of special geotechnical work — Bored piles*

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

EN 1990:2023, *Eurocode — Basis of structural and geotechnical design*

EN 1991 (all parts), *Eurocode 1 — Actions on structures*

prEN 1992-1-1:2021, *Eurocode 2 — Design of concrete structures – Part 1-1: General rules and rules for buildings, bridges and civil engineering structures*

EN 1993-1, (all parts), *Eurocode 3 — Design of steel structures*

prEN 1994-1-1:202x, *Eurocode 4 — Design of composite steel and concrete structures — 1-1: General rules and rules for buildings (under development)*

EN 1997 (all parts), *Eurocode 7 — Geotechnical design*

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EN 10210 (all parts), *Hot finished steel structural hollow sections*

EN 10219 (all parts), *Cold formed welded steel structural hollow sections*

EN 10248 (all parts), *Hot-rolled steel sheet piles*

EN 10249 (all parts), *Cold formed steel sheet piling*

EN 12063, *Execution of special geotechnical work — Sheet pile walls, combined pile walls, high modulus walls*

EN 12699, *Execution of special geotechnical work — Displacement piles*

EN 14199, *Execution of special geotechnical work — Micropiles*