



SLOVENSKI STANDARD
SIST EN 1990:2023/oprA1:2024
01-junij-2024

**Evrokod - Osnove projektiranja konstrukcij in geotehničnega projektiranja - 1. del:
Nove konstrukcije**

Eurocode - Basis of structural and geotechnical design - Part 1: New structures

Eurocode - Grundlagen der Planung von Tragwerken und geotechnischen Bauwerken -
Teil 1: Neubauten

Eurocode - Bases des calculs structuraux et géotechniques - Partie 1 : Structures
neuves

Ta slovenski standard je istoveten z: EN 1990:2023/prA1

<https://standards.iteh.ai/catalog/standards/sist/2e88dd64-27a7-4431-abda-80595919548c/sist-en-1990-2023-opra1-2024>

ICS:

91.010.30 Tehnični vidiki Technical aspects

SIST EN 1990:2023/oprA1:2024 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
EN 1990:2023

prA1

March 2024

ICS 91.010.30

English Version

Eurocode - Basis of structural and geotechnical design - Part 1: New structures

Eurocode - Bases de calcul des structures et
géotechniques - Partie 1 : Nouveaux structures

Eurocode - Grundlagen der Planung von Tragwerken
und geotechnischen Bauwerken - Teil 1: Neubauten

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

This draft amendment A1, if approved, will modify the European Standard EN 1990:2023. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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prEN 1990-1:2024 (E)

European foreword

This document (prEN 1990-1:2024) 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 an amendment to EN 1990:2023 and is currently submitted to the Enquiry.

The following main changes to EN 1990:2023 is included in the amendment:

- inclusion of application rules for:
 - towers, masts and chimneys (Clause A.3);
 - silos and tanks (Clause A.4);
 - structures supporting cranes or other machines (Clause A.5);
 - coastal structures (Clause A.6);
- inclusion of combination factors for new categories for imposed loads.

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.

prEN 1990-1:2024 (E)**1 Modification to the title**

Replace “Eurocode — Basis of structural and geotechnical design” with “Eurocode — Basis of structural and geotechnical design — Part 1: New structures”.

2 Modifications to the Introduction

Replace subclause 0.2 with:

“0.2 Introduction to EN 1990

This document gives the principles and requirements for safety, serviceability, robustness, and durability of new structures and existing structures that are common to all Eurocodes parts and are to be applied when using them.

EN 1990 is subdivided in various parts:

EN 1990-1 *Eurocode — Basis of structural and geotechnical design — Part 1: New structures;*

EN 1990-2 *Eurocode — Basis of structural and geotechnical design — Part 2: Assessment of existing structures.”*

Add a new subclause 0.3, then have the following subclauses automatically renumbered:

“0.3 Introduction to EN 1990-1

This document gives the principles and requirements for safety, serviceability, robustness, and durability of new structures that are common to all Eurocodes parts and are to be applied when using them. This part can also be applied for existing structures, with the additional provisions given in prEN 1990-2.”

In the new subclause 0.5, replace EN 1990 with EN 1990-1.

In the new subclause 0.5, replace the list “National choice is allowed in EN 1990-1 through notes to the following” with the following:

4.1(4)	4.2(4)	4.3(1)	4.4(2)
4.7(1)	6.1.3.2(4) – 3 choices	6.1.3.2(6)	7.1.5(7)
8.3.2.1(4)	8.3.3.1(5)	8.3.3.6(1)	8.3.4.2(2) – 2 choices
A.1.3(1)	A.1.4(1)	A.1.6.1(1) – 3 choices	A.1.6.3(1)
A.1.7(1) – 2 choices	A.1.8.1(1)	A.1.8.2.2(2)	A.1.8.2.3(2)
A.1.8.3(1)	A.1.8.3(3)	A.1.8.3(4)	A.1.8.4(2)
A.1.8.4(4) – 3 choices	A.2.3(1)	A.2.4(1)	A.2.7.1(1) – 3 choices
A.2.7.3.6(1)	A.2.7.4.1(1) – 2 choices	A.2.7.4.3(1)	A.2.7.4.5(1)
A.2.7.4.6(1) – 2 choices	A.2.7.5.1(1)	A.2.7.5.3(1)	A.2.7.5.4(1) – 2 choices
A.2.7.6.1(1)	A.2.7.6.4(1)	A.2.7.10(5) – 2 choices	A.2.7.10(9)
A.2.8(1) – 3 choices	A.2.9.1(1)	A.2.9.3.1(5)	A.2.9.3.3(1)
A.2.9.3.3(3)	A.2.9.3.3(4)	A.2.9.4.1(1) – 2 choices	A.2.9.4.2.1(3)
A.2.9.4.2.2(4)	A.2.9.4.2.2(5)	A.2.9.4.2.3(1)	A.2.9.4.2.3(2)
A.2.9.4.2.4(2) – 2 choices	A.2.9.4.2.4(4)	A.2.9.5(1)	A.2.10(1)
A.2.11.1(9)	A.2.11.4.5(3)	A.2.11.4.7(1)	A.3.2(1)

A.3.3(1)	A.3.5.1(1) – 4 choices	A.3.5.3(1)	A.3.6(1) – 2 choices
A.3.7.1(3)	A.3.7.4(3)	A.4.2.1(1)	A.4.2.1(2)
A.4.2.2(1)	A.4.2.2(2)	A.4.3.1(1)	A.4.3.1(3)
A.4.3.2(1)	A.4.5.1.1(1) – 2 choices	A.4.5.3(1)	A.4.5.3(2)
A.4.6(3) – 2 choices	A.4.6(4)	A.5.3(2)	A.5.4(1)
A.5.5.3(6)	A.5.6.2(1)	A.5.6.2(2)	A.5.6.4(1)
A.5.7.1(1)	A.5.7.1(6)	A.5.8(2)	A.6.3(1)
A.6.4(1)	A.6.6.1(1) – 3 choices	A.6.6.3(1)	A.6.7(1) – 2 choices
B.2(1)	B.4(2)	B.5(1)	B.6(1)
B.6(2)	B.7(1)	B.8(1)	C.3.1(5)
C.3.4.2(3)	D.4.1(1)	E.4(4)	G.2(1)
G.3.1(6)	G.3.3.2(1)	G.3.3.2(2)	G.3.4(2)
G.3.4(3)	G.6(2)	G.7.1.2(2)	G.7.1.3(2)
G.7.3.2(2)	G.7.4.2(1)	G.7.5.1(1)	G.7.5.2(1) – 2 choices

3 Modifications to 1.1, Scope of prEN 1990-1

In the title of the Clause, replace EN 1990 with prEN 1990-1.

Add a new paragraph (2), then have the following subclauses automatically renumbered:

“(2) This document is also applicable for existing structures, with the additional provisions given in prEN 1990-2.”

Replace the new paragraph (3) and (4) with:

“(3) This document is intended to be used in conjunction with the other Eurocodes for buildings and civil engineering works, including temporary structures.”

“(4) This document describes the basis for structural and geotechnical verification according to the limit state principle.”

Delete the old paragraph (5):

“(5) This document is also applicable for:

- structural assessment of existing structures;
- developing the design of repairs, improvements and alterations;
- assessing changes of use.

NOTE Additional or amended provisions can be necessary.”

Replace the paragraph (6) with:

“(6) This document is also applicable for structures where materials or actions outside the scope of EN 1991 (all parts) to EN 1999 (all parts) are involved.

NOTE In this case, additional or amended provisions can be necessary.”

prEN 1990-1:2024 (E)**4 Modifications to 1.2, Assumptions**

Replace subclause 1.2 with:

“(1) It is assumed that reasonable skill and care appropriate to the circumstances is exercised in the design of new structure and assessment of existing structures, based on the knowledge and good practice generally available at the time the structure is designed.

(2) It is assumed that the design and assessment of the structure is made by appropriately qualified and experienced personnel.

(3) The design rules provided in the Eurocodes assume that:

- execution will be carried out by personnel having appropriate skill and experience;
- adequate control and supervision will be provided during design, assessment and execution of the works, whether in factories, plants, or on site;
- construction materials and products for new structures or new structural members will be used in accordance with the Eurocodes, in the relevant product and execution standards, and project specifications;
- the structure will be adequately maintained;
- the structure will be used in accordance with the assumptions.

NOTE Guidance on management measures to satisfy the assumptions for design, assessment and verification and execution is given in Annex B.”

5 Modifications to 3.1, Terms and definitions

Add the following new term 3.1.1.4, then have the former term 3.1.1.4 and the following terms automatically renumbered:

“3.1.1.4**existing structure**

any structure that physically (materially) exists”

Add the following new term 3.1.1.8, then have the former term 3.1.1.8 and the following terms automatically renumbered:

“3.1.1.8**coastal structure**

structure located in the coastal zone, opposing wave attacks or protecting against erosion, exposed to actions arising from environmental sea conditions, specifically waves, water-levels and currents and where those actions are likely to be the dominant action(s) affecting the load case of the structure

EXAMPLE Examples of coastal structures are:

- cylindrical structures, fixed decks, fluid conduits, e.g. slender structures such as single piles, pile arrays, inclined or horizontal structural members, sea outfalls;
- mound breakwaters, e.g. rubble mound breakwaters armoured with one or more layers of rock or concrete units;
- vertical faced breakwaters, e.g. caisson type breakwaters either surrounded by water or protecting land (reclaimed or not);

- composite breakwaters, e.g. combined rubble mound and vertical breakwaters;
- coastal embankments, e.g. sloping revetments protecting land, armoured with one or more layers of rock, concrete units or blocks;
- floating structures, such as pontoons, access platforms, moored barges.

Note 1 to entry: Port structures (piers, jetties, quaywalls, marine terminals, etc.) in sheltered marine areas are not considered as coastal structures. Port structures where wave or current actions are dominant actions are considered as coastal structures.”

Replace the title of subclause 3.1.2 with:

“3.1.2 Terms relating to design and assessment”

Replace the term 3.1.2.2 with:

“3.1.2.2

design situation

physical conditions expected to occur during a certain time period for which it is to be demonstrated, with sufficient reliability, that relevant limit states are not exceeded

Note 1 to entry: Design situations can also apply to situations for assessment of existing structures.”

Replace the term 3.1.2.24 with:

“3.1.2.24

structural reliability

ability of a structure or a structural member to fulfil the specified requirements during the service life for which it has been designed

Note 1 to entry: Reliability covers safety, serviceability and durability of a structure.

Note 2 to entry: For existing structures the ability to fulfil the requirements during the remaining service life will be relevant.”

Add the following new terms 3.1.2.25 and 3.1.2.26, then have the former terms 3.1.2.25 and 3.1.2.26 and the following terms automatically renumbered:

“3.1.2.25

assessment of an existing structure

verification of the reliability of an existing structure

3.1.2.26

structural performance

quantitative indicator of structural behaviour

EXAMPLE Indicators can be structural safety, serviceability, durability or robustness.”

Add the following new term 3.1.2.28, then have the former term 3.1.2.28 and the following terms automatically renumbered:

“3.1.2.28

risk

expected value of the magnitude of the consequences of failure, i.e. the sum of the products of the magnitude of possible consequences of a failure event and the corresponding probability”

Add the following new term 3.1.4.1; then have the former term 3.1.4.1 and the following terms automatically renumbered:

prEN 1990-1:2024 (E)**“3.1.4.1****material property**

physical or chemical attribute of a construction material”

Replace the term 3.1.4.4 with:

“3.1.4.4**design value of a material or product property**

X_d

value obtained by dividing the representative value of a material or product property by a partial material factor

Note 1 to entry: In special circumstances, the value may be obtained by direct determination.

Note 2 to entry: For specific rules, see the other Eurocodes.”

Add the following new subclauses 3.1.8 and 3.1.9:

“3.1.8 Terms relating to silos and tanks**3.1.8.1****silos**

single containment structure used to store particulate solids (also known as a bunker, bin or silo cell)

Note 1 to entry: This term also refers to a single cell in a silo battery.

3.1.8.2**silos battery**

group of containment structures closely linked, permitting many different types of similar solids to be stored separately

Note 1 to entry: In some languages the term “silo” is also used to mean a silos battery.

3.1.8.3**process silos**

silos that is regularly filled and partially or fully discharged throughout each year (more than 50 times per year)

3.1.8.4**storage silos**

silos with an inflow and/or partial discharge less than 50 times per year

Note 1 to entry: See 4.2.

3.1.8.5**silos discharge load**

the pressures acting on the walls of a silos during the discharge process, assuming that the silos is still in its full condition, but that the flow pattern of the discharge has been fully developed or during simultaneous filling and discharge

3.1.8.6**silos filling load**

the pressures acting on the walls of a silos during the filling process and during storage in the full condition

3.1.8.7**tank**

containment structure used to store liquids and/or gasses

3.1.8.8**tank load**

the condition of a tank filled to the specified maximum level of liquid and with internal pressure from the liquid and pressure or suction from contained gas, vapour or air above the liquid surface

3.1.9 Terms relating to structures supporting cranes or other machines**3.1.9.1****machine**

assembly, fitted with or intended to be fitted with a drive system consisting of linked parts or components, at least one of which moves, and which are joined together for a specific application

Note 1 to entry: The design of machines is outside the scope of the Eurocodes, since machines are covered by Machinery Directive.

3.1.9.2**crane**

machine intended for the hoisting and moving in space of a load suspended by means of a hook or other load-handling device

Note 1 to entry: For crane design, see EN 13001.

Note 2 to entry: When the term “machine” is used, it refers to machines other than cranes.

3.1.9.3**structure supporting cranes or machines**

civil engineering structure or structural part that is exposed to crane or machine induced actions

3.1.9.4**parts of the crane**

all fixed and movable elements permanently assembled to form the crane itself

EXAMPLE The main crane structure, the hoist medium(s), and the fixed load lifting attachments.

Note 1 to entry: Elements not easily detachable from the crane are part of the crane.

3.1.9.5**hoist**

load-lifting and/or load-lowering mechanism

[SOURCE: prEN 1991-3:2024, 3.1.2.1]

3.1.9.6**trolley**

assembly designed to traverse the suspended load

[SOURCE: prEN 1991-3:2024, 3.1.2.2]

prEN 1990-1:2024 (E)**3.1.9.7****main structure of crane**

major structural part of the crane, including if exist counterweight(s), trolley, if present, mechanical and electrical equipment

[SOURCE: prEN 1991-3:2024, 3.1.2.3]

3.1.9.8**hoist medium**

wire rope(s), chain(s) or any other equipment hanging down from the crane used to lift and lower loads suspended from the lower end(s) of the hoist medium(s)

Note 1 to entry: Hoist mediums are part of the crane.

[SOURCE: prEN 1991-3:2024, 3.1.2.4]

3.1.9.9**fixed load-lifting attachment**

any equipment, from which the net load can be suspended and which is permanently fastened to the lower end(s) of the hoist medium(s)

Note 1 to entry: Fixed load-lifting attachments are part of the crane.

[SOURCE: prEN 1991-3:2024, 3.1.2.5]

3.1.9.10**non-fixed load-lifting attachment**

any equipment which connects the payload with the crane and which is neither part of the crane nor the payload

Note 1 to entry: Non-fixed load-lifting attachments are easily detachable from the crane and from the payload.

[SOURCE: prEN 1991-3:2024, 3.1.2.6]

3.1.9.11**payload**

load which is lifted by the crane and suspended from the non-fixed load-lifting attachment(s) or, if such an attachment is not used, directly from the fixed load-lifting attachments

Note 1 to entry: If cranes are used for lifting gates at hydro-power stations or for lifting the load from water, the payload may also include forces due to waterflow suction or water adhering by suction.

[SOURCE: prEN 1991-3:2024, 3.1.2.7]

3.1.9.12**net load**

load, which is lifted by the crane and suspended from the fixed load-lifting attachment(s)

Note 1 to entry: Net load contains the payload and the non-fixed load-lifting attachment(s).

[SOURCE: prEN 1991-3:2024, 3.1.2.8]

3.1.9.13**rated capacity**

maximum net load that the crane is designed to lift for a given crane configuration and load location during normal operation

3.1.9.14**skewing**

deviation from free-rolling, natural travelling or traversing direction.

[SOURCE: prEN 1991-3:2024, 3.1.2.10]

3.1.9.15**normal service conditions**

all operations of a crane or machine that occur if the crane or machine is used for its intended purpose

3.1.9.16**working cycle**

sequence of movements which commences when the crane is ready to hoist the payload, and ends when the crane is ready to hoist the next payload”

6 Modifications to 3.2, Symbols and abbreviations

Add the following new symbols in the relevant subclause to 3.2:

“

$A_{ref,x}$	Appropriate reference area
$F_{fat,eq}$	Fatigue damage equivalent action
G_{main}	Self-weight of main structure of a crane
G_{sus}	Self-weight of suspended parts of a crane
LDi	Limited displacement
SDi	Severe displacement
$\gamma_{Q,L}$	Partial factor for variable liquid loads
$\gamma_{Q,V}$	Partial factor for variable gas or vapour pressure
φ_I	Importance factor

”

Replace the definitions of the following symbols:

“

F_{wk}	Characteristic wind force
G_{exp}	Shear modulus determined by testing
Q_{Lk}	Characteristic horizontal force resulting from acceleration and braking

”

prEN 1990-1:2024 (E)

Rename the following symbols:

$d_{\text{execution}}$ is renamed d_{exe}

Φ is renamed $\Phi()$

Φ_{dyn} is renamed Φ

Delete the symbol q_{1k} .

7 Modifications to 6.1.2.1, General

In the paragraph (1), delete Note 1, then unnumber the following note:

“NOTE 1 Representative values are not defined for accidental and seismic actions, nor for bearing forces.”

8 Modifications to 6.2, Material and product properties

Replace the paragraph (4) with:

“(4) Material properties should be determined from standard tests performed under specified conditions that provide reliable and accurate values at a sufficient confidence level.

NOTE 1 Reliable and accurate material and product properties are needed to achieve the level of structural reliability specified in the Eurocodes.

NOTE 2 Standard tests and conditions used to ensure reliable and accurate material and product properties are typically given in material and product standards referenced in the relevant Eurocode. Where no suitable standard exists, the Eurocodes can include provisions on determining material and product properties required for design.

NOTE 3 For the determination of material and product properties from test results, see also Annex D.”

In the paragraph (6), add a new note in the end:

“NOTE For geotechnical structures, best estimate values can also be used. See EN 1997 (all parts).”

Replace the paragraph (7) with:

“(7) When material or product properties are not specified in the Eurocodes, or when nominal values are selected, their values should be chosen and specified in the design to achieve a level of structural reliability no less than that in the Eurocodes.

NOTE For guidance on structural reliability, see Annex C.”

9 Modifications to 8.3.3.8, Partial factors

Delete the footnote:

“The Clauses A.3, A.4, A.5 and A.6 will be published in subsequent amendments.”

10 Modifications to A.1.2, Scope and field of application

Replace the paragraphs (1), (2) and (3) with the following:

“(1) This Clause A.1 applies to the verification by the partial factor method of buildings and associated geotechnical structures.

(2) This Clause A.1 applies to the verification by the partial factor method of geotechnical structures not covered by Clauses A.2 to A.6.