



SLOVENSKI STANDARD
oSIST prEN 13670:2007
01-maj-2007

Izvajanje betonskih konstrukcij

Execution of concrete structures

Ausführung von Tragwerken aus Beton

Exécution des structures en béton

Ta slovenski standard je istoveten z: prEN 13670

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Execution of concrete structures

Exécution des structures en béton

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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.

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Foreword

This document (prEN 13670:2007) has been prepared by Technical Committee CEN/TC 104 “Concrete and related products”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede ENV 13670-1:2000.

Because of the close connection between design rules and rules for execution, CEN/TC 104/SC 2 has developed this standard in liaison with CEN/TC 250/SC 2, and CEN TC 229.

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Introduction

This European Standard applies to the execution of concrete structures to achieve the intended level of safety and serviceability during its service life, as given by EN 1990 – *Basis of structural design*, and EN 1992 – *Design of concrete structures* and EN 1994 *Design of composite steel and concrete structures*, with the Nationally Determined Parameters (NDPs) applicable in the place of use.

This European Standard has three functions:

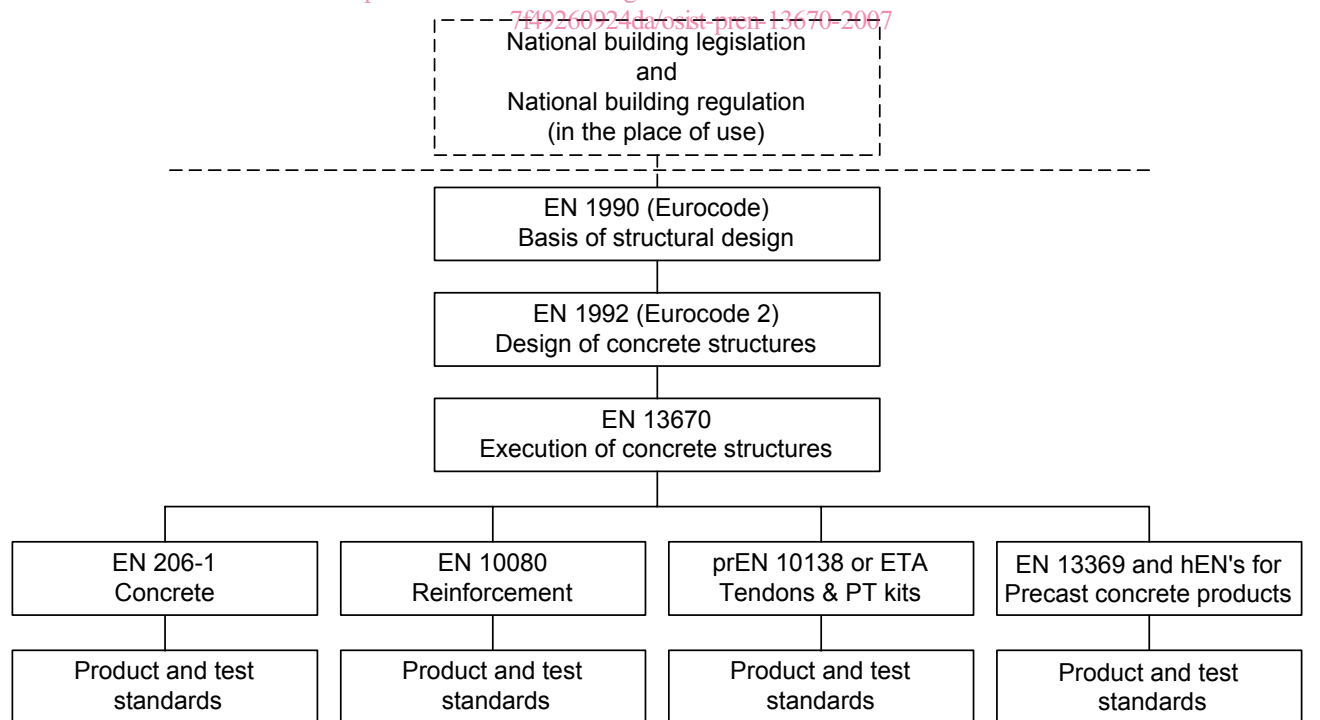
- to transfer the requirements set during design to the constructor i.e. to be link between design and execution;
- to give a set of standardized technical requirements for the execution when ordering a concrete structure;
- to serve as a check list for the designer to ensure that he provides the constructor with all relevant technical information for the execution of the structure (see Annex A).

In order to achieve these objectives the design shall result in a set of documents and drawings giving all information required for the execution of the work in accordance with the plans. This set of documents is in this European Standard referred to as the "execution specification". The standard leaves a number of items open to be decided in the execution specification.

In areas where national provisions shall apply these should be referred in the execution specification.

It is in this European Standard recognised that areas such as detailed requirements for competence of personnel, and details related to the Quality Management are within the competence of the Member States.

If the national CEN member publishes a National Annex to this Standard, it may refer to national standards approved and published by the CEN member or national provisions, which supplement this standard, alternatively the supplementing rules can be given directly in the National Annex.



System of European Standards as basis for design, execution and materials selection for concrete works (only main modules)

1 Scope

- (1) This European Standard gives common requirements for execution of concrete structures.
- (2) This standard expects the execution specification to state all the specific requirements relevant to the particular structure.
- (3) This standard is applicable to temporary as well as permanent concrete structures.
- (4) Additional or different requirements should be considered and, if required, given in the execution specification when using:
- lightweight aggregate concrete;
 - other materials (e.g. fibres) or constituent materials;
 - special technologies/innovative designs.
- (5) This standard does not apply to concrete members used only as equipment or construction aids for the execution.
- (6) This standard does not cover the specification, production and conformity of concrete.
- (7) This standard is not applicable to the production of precast concrete elements made in accordance with product standards.
- (8) This standard does not cover the requirements for concrete members in special geotechnical works such as pile foundations, ground anchors, slurry walls, etc.
- (9) This standard does not cover safety and health aspects of execution, or third party safety requirements.
- (10) This standard does not cover contractual issues or responsibilities for the identified actions.

2 Normative references

(1) The following referenced documents are indispensable for the application 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.

EN 206-1	<i>Concrete – Part 1: Specification, performance, production and conformity</i>
EN 446	<i>Grout for prestressing tendons – Grouting procedures</i>
EN 447	<i>Grout for prestressing tendons – Specifications for common grout</i>
EN 523	<i>Steel strip sheaths for prestressing tendons – Terminology – Requirements and quality control</i>
EN 1065	<i>Adjustable telescopic steel props – Product specifications, design and assessment by calculation and tests</i>
EN 1990	<i>Eurocode – Basis of structural design</i>
EN 1991	<i>Eurocode 1: Actions on structures</i>
EN 1992	<i>Eurocode 2: Design of concrete structures</i>

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EN 1994 *Eurocode 4: Design of composite steel and concrete structures*

EN10080 *Steel for the reinforcement of concrete – Weldable reinforcing steel*

prEN 10138 *Prestressing steels*¹⁾

prEN ISO 17660-1 *Welding – Welding of reinforcing steel – Part 1: Load bearing welded joints*

prEN ISO 17660-2 *Welding – Welding of reinforcing steel – Part 2: Non-load bearing welded joints*

3 Definitions

For the purposes of this standard, the following definitions apply:

**3.1
backpropping**
propping installed at levels below the slab that supports the falsework in order to distribute the load to suitable support

**3.2
chair for reinforcement**
device used to secure the position between reinforcement layers e.g. supporting top reinforcement in a slab

**3.3
construction works**
everything that is constructed or results from construction operations (EN 1990)

NOTE The term covers both building and civil engineering works. It refers to the complete construction comprising both structural and non-structural components

**3.4
constructor**
the organization executing the works

**3.5
erection specification**
documents covering all drawings, technical data and requirements required for the safe erection of precast elements

**3.6
execution**
all activities carried out for the physical completion of the work, i.e. procurement, scaffolding, formwork, reinforcing, concreting, curing, erection of precast elements etc., and the inspection and documentation thereof

**3.7
execution class**
classified set of requirements specifying quality levels for the execution of the works generally or an individual component

1) European Standard for prestressing steels (prEN 10138) is presently in preparation. Until it is issued and implemented, national standards apply, in lieu of national standards ISO 6934 may be applied.

3.8**execution specification**

documents covering all drawings, technical data and requirements necessary for the execution of a particular project prepared supplementing and qualifying the requirements of this European Standard, as well as referring the national provisions relevant in the place of use

NOTE The execution specification is not one document but signifies the total sum of documents required for the execution of the work as provided by design to the constructor. and includes the project specification.

3.9**falsework**

temporary support for a part of a structure while it is not self-supporting and for associated service load

3.10**formwork**

a structure, permanent or temporary, for containing poured concrete, moulding it to the required dimensions and supporting it until it is able to support itself. Formwork consists of the face contact material and the bearers directly supporting the face contact material

3.11**inspection**

conformity evaluation by observation and judgement accompanied as appropriate by measurement, testing or gauging

[EN-ISO 9000]

3.12**method statement**

documentation describing the methods and procedures to be used to perform the work

3.13

permitted deviation <https://standards.iteh.ai/catalog/standards/sist/b710dbcb-c4b2-4eb9-8d6f-927e11e11e11/iso-1803-1-building-construction-tolerances-vocabulary-part-1-general-terms>
permitted algebraic differences between the limits of size and the corresponding reference size (see ISO 1803-1 *Building construction – Tolerances – Vocabulary – Part 1: General terms*)

3.14**precast concrete element**

concrete element cast and cured in a place other than the final location of use (factory produced or site manufactured). Precast concrete element manufactured in compliance with relevant European product standard is called precast concrete product

NOTE In this standard the shorter terms "precast element" and "precast product" are used.

3.15**project specification**

a project specific document describing the requirements applicable for the particular project

3.16**quality plan**

document specifying which procedures and associated resources shall be applied by whom and when to meet the requirements of the specific project

3.17**reference line**

line defined in the execution specification to which sizes are related

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3.18

secondary line

any line used for the purpose of setting-out the proposed building and for checking the conformity of the building or building parts (see ISO 4463-1:1998 *Measurement methods for building. Setting out measurements - Part 1: Planning and organization measuring procedures, acceptance criteria*)

3.19

spacer

device used to secure correct spacing between the form and the reinforcement

3.20

surface finish

description of the appearance of the concrete surface including aspects of geometry, texture, colour etc.

3.21

temporary structure

structure designed for a short design working life (see EN 1990)

3.22

tolerance

difference between upper limit of size and the lower limit of size (see ISO 1803 *Building construction – Tolerances-Expression of dimensional accuracy – Principles and terminology*)

Tolerances for precast concrete elements are subdivided as follows:

- production tolerances i.e. geometrical tolerances as defined in the product standards;
- erection tolerances i.e. geometrical tolerances relating to location, verticality, horizontality or other characteristics of the construction assembly;
- construction tolerances i.e. geometrical tolerances that are a combination of production, site construction and erection tolerances.

NOTE Tolerance is an absolute value without sign, it is however commonly expressed by "± permitted deviation" so that the value of tolerance is implicit.

3.23.1

normal tolerances

the basic limits for geometrical deviations that ensures that the structure:

- satisfies the design assumptions;
- achieves other functional requirements of the construction works.

NOTE In this standard, normal tolerances are referred to as tolerance class 1.

3.24.2

special tolerances

other tolerances than normal tolerances

3.25

works

in the sense of this standard, those parts of the construction works that are structural concrete work and are described in the execution specification

4 Execution management

4.1 Assumptions

(1) This European standard assumes:

- the availability of a comprehensive design of the structure
- a project management in charge of the supervision of the works which will enable the execution of a conforming structure;
- a site management which will take charge of the organisation of the works and enable the correct and safe use of the equipment and machinery, the satisfactory quality of materials, the execution of a conforming structure and its safe use up to the delivery of the works.

(2) When precast elements are used, the following additional assumptions are made:

- the availability of a specific design of the precast elements conforming to the relevant standards;
- the availability of a design coordination between precast elements and site manufactured components;
- a technical specification of the precast structure with instructions for installation;
- there is an erection management to direct the erection team.

(3) This European standard presupposes that the work is carried out with the necessary skill and adequate equipment and resources to perform the work in accordance with this European Standard and the requirements of the execution specification.

NOTE In some countries, there are special requirements regarding the level of knowledge, training and experience of personnel involved in the different tasks

(4) It is assumed that the constructor will comply with national regulations and standards e.g. with respect to:

- quality management <https://standards.iteh.ai/catalog/standards/sist/b710dbcb-c4b2-4eb9-8d6f-0SIST-prEN-13670:2007>
- qualifications for the personnel doing the various activities covered by this standard;
- health and safety aspects of construction;
- environmental aspects.

(5) This standard assumes that the finished structure after completion is used as intended in the design and submitted to the planned inspection and maintenance necessary to achieve the intended design working life and to detect weaknesses or any unexpected behaviour.

4.2 Documentation

4.2.1 Execution specification

(1) Before commencement of execution of any part of the works, the execution specification relevant to that part of the works shall be complete and available.

(2) The following items shall be included in the execution specification:

- a reference to this European standard and, if published, its National Annex;
- a reference to other relevant European standards and ETA's;
- a reference to other relevant national regulations and standards;
- a project specification giving information and requirements for the particular project prepared to supplement and qualify the requirements of the above listed documents;
- drawings and other technical documents needed for the execution.

NOTE Annex A, Table A1 contains a checklist of requirements and information that may have to be included in the execution specification as appropriate.

(3) In addition where relevant, procedures shall be established for:

- making alterations to previously agreed requirements;
- the distribution, the filing and recording of technical documents used for the works.

4.2.2 Quality Plan

(1) Where a quality plan is required by the execution specification, it shall be available at site.

(2) There may be one quality plan covering all activities or one overall plan supplemented by separate plans for the various phases and activities to be performed.

4.2.3 Execution documentation

(1) A record shall be made giving the required information as specified for the Execution Class in tables 1, 2 and 3.

4.2.4 Special documentation

(1) If special documentation is required, the type and extent of the documentation shall be stated in the execution specification.

4.3 Quality Management

4.3.1 Execution classes

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(1) Supervision and inspection shall ensure that the works are completed in accordance with the execution specification.

(2) Inspection in this context refers to verifying conformity of the properties of products and materials to be used as well as inspection of the execution of the works.

(3) Requirements for quality management are specified using one of the following 3 classes, for which the required strictness increases from class 1 to class 3:

- Execution Class 1;
- Execution Class 2;
- Execution Class 3.

(4) The execution class may refer to the complete structure, to components of the structure or to certain materials/technologies used for the execution.

(5) The execution class to be used shall be stated in the execution specification.

(6) This European Standard does not deal with provisions related to degree of independence of the personnel performing the inspection.

(7) Further detailing of the requirements for the quality management regime in excess of what is given in this document, may be stated in the execution specification.

4.3.2 Inspection of materials and products

(1) The inspection requirements for conformity with the execution specification are given in Table 1.

Table 1 – Inspection for materials and products

Subject	Execution Class 1	Execution Class 2	Execution Class 3
Materials for scaffold, formwork and falsework ¹⁾	In accordance with 5.1 and 5.2		
Reinforcing steel ¹⁾	In accordance with 6.2		
Prestressing system components ¹⁾	Not to be used in this class	In accordance with 7.2	
Fresh concrete; ^{1), 3)} ready-mixed or site-mixed	In accordance with 8.1 and 8.2 At reception of ready-mixed concrete a delivery ticket shall be present		
Other items ^{1), 2)}	In accordance with the execution specification		
Precast elements ¹⁾	In accordance with 9.2 and 9.3		
Inspection report	Not required	Required	
<p>¹⁾ Products bearing the CE-mark or certified by an approved certification body shall be checked against the delivery ticket and visually inspected. In cases of doubt, further inspection shall be undertaken to check that the product conforms to its specification. Other products shall be subject to inspection and acceptance testing as defined in the execution specification</p> <p>²⁾ For example, items such as embedded steel components etc.</p> <p>³⁾ If prescribed concrete is used, the relevant properties are to be checked by tests</p>			

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4.3.3 Inspection of execution

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(1) The inspection requirements for conformity with the execution specification are given in Table 2 and 3.

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Table 2 – Subjects of execution

Subject	Execution Class 1	Execution Class 2	Execution Class 3
Scaffolding, formwork and falsework	According to requirements given in 5		
Ordinary reinforcement	According to requirements given in 6		
Prestressing reinforcement	Not to be used in this class	According to requirements given in 7	
Embedded items	According to requirements given in 5.6		
Erection of precast elements	According to requirements given in 9		
Site transport and casting and curing of concrete	According to requirements given in 8		
As-built geometry	Not required	According to execution specification	