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ISO 19338

Performance requirements for standards on concrete structures

Exigences de performance pour les normes relatives aux structures en béton

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete,* Subcommittee SC 4, *Performance requirements for structural concrete.*

This fourth edition cancels and replaces the third edition (ISO 19338:2014), which has been technically revised.

The main changes are as follows:

— title has been revised in order to best reflect the new Scope;

— Scope has been expanded, now including performance requirements for standards on assessment of existing concrete structures;

— Normative references has been revised;

— Terms and definitions has been expanded;

— new Clause 4 on general principles guiding the design of new concrete structures and the assessment of existing ones has been included, with an emphasis on life cycle management;

— new Clauses 7 and 11, and Annex A have been added;

— former Clause 7, Assessment, has been reorganized into two new Clauses 9 and 10.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Concrete is the most popular material used in the construction market. Presently, about four tonnes of concrete are produced each year for every human being in the world (some 32 billion tonnes per year). This also translates into an omnipresence of concrete structures in the built environment, which, in turn, are managed during their life cycle under the constraints of sustainability.

International Standards on concrete technology and concrete structures can play a significant role in improving the global trade climate. International Standards in the field of concrete and its use in civil infrastructure are increasingly needed as the economic development of the world continues and new problems are identified.

Both developed and developing countries currently face the challenge of designing and building new structures while managing an aging built environment under economic and sustainability constraints. Consequently, standardization should be pursued not only of the design of new concrete structures, but also of the assessment of existing concrete structures.

It is important for uncertainties to be dealt with in the design and assessment of concrete structures. These can be related to inherent variability such as material properties, dimensions, and loads, or epistemic uncertainties, i.e. those related to the lack of (or limited) knowledge. In this latter category, there are errors associated with predictive models, sampling errors and measurement errors.

Design standards for new concrete structures allow for uncertainties in the design and construction processes; on the other hand, much of what was initially uncertain is no longer in the finished structure[8]. However, the determination of the actual values of various parameters (e.g. in situ concrete compressive strengths and area of longitudinal reinforcement) in the existing concrete structure introduces uncertainty of its own. The structure can have undergone a deterioration process, such as corrosion of the reinforcement or been damaged by accidental actions. Additionally, economic, social and environmental considerations can result in a greater differentiation in structural reliability for the assessment of existing structures than for the design of new structures (ISO 13822). As a result, standards for the assessment of existing concrete structures should recognize the differences between the assessment of existing concrete structures and the design of new ones.

This document gives the performance requirements for design, assessment or design and assessment standards on concrete structures. This document provides general provisions and guidelines, and is intended to provide wide latitude of choice in terms of general requirements for the performance evaluation of concrete structures. It should be used, therefore, in conjunction with sound engineering judgment.

ISO/TC 71/SC 4 has defined a procedure[1)] to review codes and standards for general alignment with ISO 19338. Summaries of these reviews are shared with the Code or standard authors, and potential beneficial changes to ISO 19338 are shared with SC 4 for review and implementation. These comparable national and regional standards are generally more prescriptive in nature than International Standards and vary somewhat from region to region.

1) Document publicly accessible at: https://www.iso.org/committee/49920.html?view=documents

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Performance requirements for standards on concrete structures

1 Scope

This document provides performance requirements for standards on concrete structures. It can be used for international alignment of design, assessment and construction requirements.

This document includes:

a) principles, which guide the selection of requirements that translate societal and owner's expectations for the performance of the concrete structure;

b) requirements, which define the required performance of the concrete structure;

c) criteria, which give means for expressing the requirements;

d) evaluation clauses, which give acceptable methods of verifying the specific criteria.

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.

ISO 2394, *General principles on reliability for structures*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
accidental action
action (3.2) whose chance of occurrence is very small, but the intensity is very large compared with *variable actions* (3.37)

3.2
action
assembly of concentrated or distributed mechanical forces acting on/in a structure (direct actions), deformations imposed on the structure or contained within it (indirect actions), or *environmental actions* (3.9)

3.3
analysis
procedure or algorithm for determination of action effects

Note 1 to entry: It is an acceptable method of evaluating the performance index or verifying compliance with specific *criteria* (3.5) of a structure.

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