
**Maintenance and repair of concrete
structures —**

**Part 2:
Assessment of existing concrete
structures**

Entretien et réparation des structures en béton —

Partie 2: Évaluation des structures en béton existantes



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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 7, *Maintenance and repair of concrete structures*.

ISO 16311 consists of the following parts, under the general title *Maintenance and repair of concrete structures*:

- *Part 1: General Principles*
- *Part 2: Assessment of Existing Concrete Structures*
- *Part 3: Design of Repairs and Prevention*
- *Part 4: Execution of Repairs and Prevention*

Introduction

Assessment of a concrete structure identifies and defines areas of distress, and verifies structural performance based on the evaluated condition of the structure. It includes the whole process from defining the work through the investigation, evaluation, verification, and registration to the final report. This is necessary as a basis for the design of the repair and the preparation of procedures to preserve or extend its remaining service life.

The report, concluding the assessment, includes a description of the structure, the investigation, the results of condition assessment, the verified structural performance, the expected future development, and a short presentation of possible repair principles and methods, including appropriate cost calculations. A detailed planning and design of the repair work (repair or rehabilitation project specification) is not part of the assessment, see ISO 16311-3.

This part of ISO 16311 gives the requirements for assessment of concrete structures, including a framework for the assessment, a format for documentation of the condition assessment with assessed condition level and consequence level, and a format for documentation of the performance assessment with verified specific structural performance.

This part of ISO 16311 is operable with standards for test methods. Some standards for test methods are under preparation by ISO but they will not all be available as International Standards at the date of publication of this part of ISO 16311. Until and after such International Standards are available, a national annex may list standards that have established suitability in the place of use of the methods. These may be national standards or standards of other regions or nations.

This part of ISO 16311 is primarily based on the principles given in ISO 13822, *Basis of design of structures — Assessment of existing structures*. Annex B in ISO 13822 has a detailed flowchart, included as [Figure 1](#) in this part of ISO 16311.

Maintenance and repair of concrete structures —

Part 2:

Assessment of existing concrete structures

1 Scope

This part of ISO 16311 describes general requirements and procedures for the assessment of concrete structures.

The assessment can be initiated under the following circumstances, but not limited to:

- a) an anticipated change in use or extension of design service life;
- b) structural deterioration due to time-dependent actions such as corrosion of reinforcement, fatigue, etc.;
- c) safety and/or serviceability check (e.g. for earthquake and increased traffic actions) as required by authorities, insurance companies, owners, etc.;
- d) structural damage by accidental actions. (See ISO 2394.)

This part of ISO 16311 does not cover

- qualification of personnel,
- contractual matters, and
- health and safety requirements for the protection of workers during the investigation and testing.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

In the case of reference to International draft standards, provisions given in the National Annex or project specification should be applied until the International Standard is available.

ISO 2394, *General principles on reliability for structures*

ISO 13822:2001, *Bases for design of structures – Assessment of existing structures*

ISO 16204, *Durability — Service life design of concrete structures*

ISO 16311-1, *Maintenance and repair of concrete structures — Part 1: General principles*

ISO 16311-3, *Maintenance and repair of concrete structures — Part 3: Design of repairs and prevention*

ISO 16311-4, *Maintenance and repair of concrete structures — Part 4: Execution of repairs and prevention*

ISO 19338, *Performance and assessment requirements for design standards on structural concrete*