International Standard

ISO 16311-3

Maintenance and repair of concrete structures —

Part 3: Design of repairs

Entretien et réparation des structures en béton —

Partie 3: Conception des réparations

Second edition
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Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Minimum considerations before repair design ... **2**
4.1 General ... 2
4.2 Initial risk assessment ... 2
4.3 Assessment of defects and their causes ... 2
5 Strategies for maintenance and repair ... **3**
5.1 General ... 3
5.2 Options ... 4
5.3 Factors ... 4
5.3.1 General ... 4
5.3.2 Structural ... 4
5.3.3 Risk assessment ... 4
5.3.4 Environmental ... 4
5.4 Choice of appropriate strategy ... 5
6 Basis for the choice of specific repair design principles, strategies, remedies and methods ... **5**
6.1 General ... 5
6.2 Repair remedies and methods of maintenance ... 5
6.2.1 General ... 5
6.2.2 Remedies and methods addressing defects in concrete and reinforcement corrosion ... 5
6.2.3 Repair of concrete and reinforcement by methods not mentioned in this document ... 7
7 Properties of products and systems required for compliance with repair remedies ... **7**
8 Design documentation requirements ... **8**
9 Compliance with health, safety and environmental requirements ... **8**
10 Competence of personnel ... **8**
Annex A (informative) **Design of repairs** ... **9**
Bibliography ... **20**

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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 7, *Maintenance and repair of concrete structures*.

This second edition cancels and replaces the first edition (ISO 16311-3:2014) which has been technically revised.

The main changes are as follows:

— the definitions of “repair” has been updated.

A list of all parts in the ISO 16311 series can be found on the ISO website.

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

The repair of defects and deterioration in concrete structures requires complex design work. This document defines the design principles, strategies, remedies and methods for the repair of concrete structures that have suffered or can suffer damage or deterioration. It gives guidance on the choice of repair design principles, strategies, remedies, methods and selection of products and systems which are appropriate for the intended use.

This document identifies key stages in the repair process:

— the need for assessment of the condition of the structure;

— the need for identification of the causes of deterioration;

— evaluating the options for repair and decision-making;

— the selection of the appropriate remedies for repair;

— the selection of methods;

— the definition of properties of products and systems;

— the specification of maintenance requirements following repair.

This document does not deal with matters related to structural design and the verification of structural performance in both deteriorated and repaired condition. The information related to the deteriorated condition is presented in ISO 16311-2.

This document contains Annex A which provides guidance and background information.

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Maintenance and repair of concrete structures —

Part 3:
Design of repairs

1 Scope

This document defines basic considerations and decision-making for the specification of repair remedies, and management strategies for reinforced and unreinforced concrete structures. This document covers only atmospherically exposed structures, and buried or submerged structures, if they can be accessed.

This document specifies repair design principles, and strategies for defects and on-going deterioration including, but not limited to:

a) mechanical actions, e.g. impact, overloading, movement caused by settlement, blast, vibration and seismic actions;

b) chemical and biological actions from environments, e.g. sulfate attack, alkali-aggregate reaction;

c) physical actions, e.g. freeze–thaw, thermal cracking, moisture movement, salt crystallization, fire, and erosion;

d) reinforcement corrosion;

e) original construction defects that remained unaddressed from the time of construction.

The execution of maintenance and repairs is covered in ISO 16311-4.

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

ISO 16311-2, *Maintenance and repair of concrete structures — Part 2: Assessment of existing concrete structures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16311-1 and the following 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
defect
fault or deviation from the intended level of performance of a structure or its parts

[SOURCE: ISO 15686-1:2011]

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