IN-LB Inch-Pound Units

An ACI Standard

Assessment, Repair, and Rehabilitation of Existing Concrete Structures—Code Requirements and Commentary

Reported by ACI Committee 562

ACI CODE-562-25

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Assessment, Repair, and Rehabilitation of Existing Concrete Structures—Code Requirements and Commentary

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ACI CODE-562-25, "Assessment, Repair, and Rehabilitation of Existing Concrete Structures—Code Requirements and Commentary," was developed to provide design professionals a code for the assessment of the damage and deterioration, and the design of appropriate repair and rehabilitation strategies. The Code provides minimum requirements for assessment, repair, and rehabilitation of existing structural concrete buildings, members, systems and, where applicable, nonbuilding structures. ACI CODE-562-25 was specifically developed to work with the International Existing Building Code (IEBC) or to be adopted as a stand-alone code.

Keywords: assessment; bond; corrosion; damage; durability; evaluation; existing structure; fiber-reinforced polymer (FRP); fire; historical reinforcing bars; interface bond; licensed design professional; maintenance; project record documents; rehabilitation; reliability; repair; strengthening; temporary works; testing agency.

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PREFACE

The Code provides minimum requirements for assessment, repair, and rehabilitation of existing concrete structures, members, and systems. This code was developed by an consensus-based process. The Code can supplement the International Existing Building Code (IEBC), supplement the code governing existing structures of an authority having jurisdiction, or act as a stand-alone code in a locality that has not adopted an existing building code.

The Code is specifically written for use by a licensed design professional. The Code provides minimum requirements for assessment, design and construction, or implementation of repairs and rehabilitation, including quality assurance requirements, for structural concrete in service. The Code has no legal status unless it is adopted by the authority having jurisdiction. Where the Code has not been adopted, it serves as a standard to provide minimum requirements for assessment, design, and construction for the repair and rehabilitation of existing structural concrete. ACI CODE-318 provides minimum requirements for the materials, design, and detailing of structural concrete buildings and, where applicable, nonbuilding structures, and for new construction within existing structures where noted herein.

Key changes from ACI CODE-562-21 to ACI CODE-562-25 include: (a) The revised code, CODE-562-25, can be used with any existing structures code (not just IEBC). (b) Chapter 1 preliminary assessment provisions relocated to Chapter 6. (c) Chapter 4 deleted the term “Potential Dangerous Structural Conditions” and replaced it with “Severe Strength Deficiencies and Dangerous Conditions.” (d) Chapter 6 incorporated preliminary assessment requirements and added new provisions on reliability-based assessment. Added provisions on durability evaluation. (e) A new chapter—Chapter 7, Fire Resistance, Assessment and Damage Repair—was added. (f) A new chapter—Chapter 8, Reinforcement Details and Condition for Structural Evaluation and Repair Design—was added. (g) Reorganized Chapter 9, previously Chapter 7, and revised provisions related to interface bond of cementitious material for repair. (h) A new chapter—Chapter 11, Temporary Works—was added. (i) Chapter 12 now includes design information requirements. (j) Chapter 13 now includes qualification requirements for inspectors and testing agencies, expanded inspection requirements, testing frequency, and construction observation, and includes provisions on interface bond strength and project record documents. (k) A new appendix—Appendix A, Mean Load Method—was added.

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CHAPTER 1—GENERAL REQUIREMENTS

CODE

1.1—Scope

This Code shall apply to assessment, repair, and rehabilitation of existing concrete structures as:

1. A code supplementing an existing building code, or
2. A stand-alone code for existing concrete structures if an existing building code is not adopted.

1.2—General

1.2.1 ACI CODE-562, "Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures," is hereafter referred to as "this Code."

1.2.2 This Code uses strength design provisions for demands and capacities, unless otherwise noted.

1.3—Purpose

1.3.1 The purpose of this Code is to safeguard the public by providing minimum requirements for assessment, repair, and rehabilitation of existing concrete structures.

1.4—Applicability of this Code

1.4.1 This Code provides minimum requirements for assessment, repair, and rehabilitation of structural concrete components in existing structures, including buildings and non-building structures.

COMMENTARY

R1.1—Scope

The Code provides assessment, design, construction, and durability requirements for repair and rehabilitation of existing concrete structures. Throughout the Code, the term "structure" means an existing building, non-building structure, member, or system, if the construction is concrete or mixed construction involving concrete with other materials.

The Code can be used in combination with an existing building code adopted by an authority having jurisdiction. For buildings, this is anticipated to be the state or local adoption of the International Existing Building Code (IEBC) developed by the International Code Council (ICC). Other codes may be applicable to non-building structures, or to structures that are not addressed in the IEBC. The provisions of this Code are intended to be used with the IEBC and similar codes.

If an existing building code is not adopted, Chapter 4 provides requirements for use of this Code as a stand-alone code.

R1.2—General

R1.2.1 In this Commentary, ACI CODE-562 is referred to as "the Code."

R1.2.2 If the existing building code or this Code permits the original building code to be used and that code uses allowable stress design, the licensed design professional should consider using the strength design methods of the Code as a check in the assessment of existing structures originally designed with allowable stress methods. Allowable stress design methods can result in designs that have inconsistent levels of structural reliability compared with modern strength design provisions (MacGregor 1974; Ellingwood et al. 1980).

R1.4—Applicability of this Code

R1.4.1 For buildings or structures similar to buildings, members that are addressed by this Code include but are not limited to foundations, soil-supported slabs, concrete portions of composite members, and precast and prestressed concrete.

In typical U.S. practice, owners are required to maintain existing structures to prevent unsafe conditions from occurring or repair an existing structure if unsafe conditions are present. The minimum level of repair for an existing structure will typically address these unsafe or dangerous conditions.

The licensed design professional can perform assessment and design and specify quality assurance activities that exceed the minimum requirements of this Code. Requirements beyond the minimum stated in the Code, such as those for long-term durability, disproportionate collapse resis-

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