ACI 562-13

Code Requirements for Evaluation, Repair, and Rehabilitation of Concrete Buildings (ACI 562-13) and Commentary

An ACI Standard

Reported by ACI Committee 562

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Code Requirements for Evaluation, Repair, and Rehabilitation of Concrete Buildings and Commentary

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This code provides minimum requirements for the evaluation, repair, rehabilitation, and strengthening of existing concrete buildings and, where applicable, nonbuilding structures.

This code does not provide complete design procedures or construction means and methods. The code comprises both prescriptive and performance requirements. Commentary is provided for both the prescriptive and performance requirements, and is intended to provide guidance to the licensed design professional and referenced sources for additional information on the material presented in the code provisions.

The code and commentary is intended for use by individuals who are competent to evaluate the significance and limitations of its content and recommendations, and who will accept responsibility for application of the material it contains.

The materials, processes, quality control measures, and inspections described in this code should be tested, monitored, or performed as applicable only by individuals holding the appropriate ACI Certifications or equivalent.

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ACI 562-13 supersedes ACI 562-12 (provisional), was adopted February 20, 2013, and was published March 2013.

INTRODUCTION

The purpose of this code is to provide minimum material and design requirements for the evaluation, repair, and rehabilitation of structural concrete members.

CODE

COMMENTARY

CHAPTER 1—GENERAL

1.1—Scope

1.1.1 The scope, purpose, applicability, exclusions, interpretation, principles, language, and units of measure are defined in this chapter.

1.1C—Scope

1.1.2 The "existing building code" refers to the code adopted by a jurisdiction that regulates existing buildings.

1.1.2C The general existing building code establishes the limit to which a repair and rehabilitation can occur in accordance with the original building code. Above these limits, the repair and rehabilitation is in accordance with the general building code. The general existing building code in the United States is usually based on the International Existing Building Code (IEBC) developed by the International Code Council (ICC). The IEBC is revised every 3 years and was first published in 2003.

1.1.3 The "current building code" refers to the general building code adopted by a jurisdiction that regulates new building design and construction. The "original building code" refers to the general building code adopted by a jurisdiction at the time the existing building was constructed.

1.1.3C The general building code establishes the design requirements for construction materials. The general building code in the United States is usually based on the International Building Code (IBC) published by the ICC. The IBC is revised every 3 years and was first published in 2000. For the design and construction of concrete structures, the IBC and legacy codes reference ACI 318, Building Code Requirements for Structural Concrete and Commentary, with exceptions and additions.

1.1.4 The "design basis code" is the general building code or the original building code under which the evaluation, repair, and rehabilitation are implemented. If a jurisdiction has adopted a general existing building code, the design basis code shall be determined in accordance with Chapter 4. If a jurisdiction has not adopted a general existing building code, 1.3 applies.

1.1.4C The general existing building code establishes limits to which a repair and rehabilitation can occur in accordance with the original building code. Above these limits, the repair and rehabilitation is in accordance with the general building code.

1.1.5 This code is intended to supplement the evaluation requirements of the general existing building code.

1.1.5C This code provides evaluation procedures for existing concrete structures. It also provides material and design requirements that allow the licensed design professional to bring existing concrete structures in compliance with building codes written for new construction.

1.1.6 This code provides minimum material and design requirements for the repair of damaged, deteriorated, or deficient structural concrete members and systems repaired in accordance with the design basis code. Structural repair includes restoring or increasing one or more of the following: strength, stiffness, ductility, and durability of existing members.

1.1.7 This code supplements the general existing building code and shall govern in all matters pertaining to the evaluation, repair, rehabilitation, and strengthening of concrete members and concrete sections of composite members in existing concrete buildings, except wherever this code is in conflict with the requirements in the general existing

CODE

building code. Wherever this code is in conflict with requirements in other referenced standards, this code shall govern.

1.1.8 *Provisions for seismic resistance*

1.1.8.1 Evaluation of seismic resistance and rehabilitation design shall be in accordance with the general existing building code.

1.1.8.2 Where rehabilitation for seismic resistance is not required by the general existing building code, voluntary rehabilitation for seismic resistance shall be permitted.

1.1.9 This code is not intended for repair of nonstructural concrete or for aesthetic improvements, except if failure of such repairs would result in an unsafe condition.

1.1.10 *Licensed design professional*

1.1.10.1 All references in this code to the licensed design professional shall be understood to mean persons who possess the knowledge and skills to interpret and properly use this code and are licensed in the jurisdiction where this code is being used. The licensed design professional for a project is responsible for and in charge of the evaluation or repair design, or both.

1.1.10.2 The licensed design professional is permitted to require evaluation, design, construction, and quality assurance that exceed the minimum requirements of this code.

1.2—Applicability

1.2.1 The requirements of this code are applicable when performing evaluation, repair, rehabilitation, and strengthening of existing concrete buildings and concrete portions of other existing buildings.

1.2.2 This code shall govern the evaluation, repair, rehabilitation, and strengthening of nonbuilding concrete structures when required by the building official.

COMMENTARY

1.1.8C Conditions for evaluation of seismic resistance and repair are provided in ACI 369R, ASCE/SEI 31, and ASCE/SEI 41. Significant improvements to a building's seismic resistance can be made using repair techniques that provide less than those detailing and reinforcement methods required for new construction. As an example, providing additional reinforcement to confine concrete in flexural hinging regions will increase the energy dissipation and seismic performance even though the amount of confinement reinforcement may not satisfy the confinement requirements for new structures (Kahn 1980; Priestley et al. 1996; Harris and Stevens 1991).

Components of the seismic-force-resisting system that require strength and ductility should be identified. Force-controlled (nonductile) action is acceptable for some classifications of components of the seismic-force-resisting system (ASCE/SEI 41). The strength requirement of 7.1 is applicable to these force-controlled components. ASCE/SEI 41 and ACI 369R provide information on rehabilitation for seismic resistance. Seismic-resisting components requiring energy-dissipating capability should maintain the ability to dissipate energy when repaired. Design and detailing requirements for proper seismic resistance of cast-in-place or precast concrete structures are addressed in ACI 318 and 369R.

1.1.10.1C The licensed design professional is expected to exercise sound engineering knowledge, experience, and judgment when interpreting and applying this code.

1.2C—Applicability

1.2.2C Such structures can include arches, tanks, reservoirs, bins and silos, blast- and impact-resistant structures, and chimneys.