

**Code Requirements for Load Testing
of Existing Concrete Structures
(ACI 437.2-13) and Commentary**

An ACI Standard

Reported by ACI Committee 437



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Code Requirements for Load Testing of Existing Concrete Structures and Commentary

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This code provides requirements for test load magnitudes, test protocols, and acceptance criteria for conducting a load test as a means of evaluating the safety and serviceability of concrete structural members and systems for existing buildings as provided for by ACI 562-13. A load test may be conducted as part of a structural evaluation to determine whether an existing building requires repair and rehabilitation, or to verify the adequacy of repair and rehabilitation measures applied to an existing building, or both. This code contains provisions for both a cyclic load test and a monotonic load test procedure.

Keywords: acceptance criteria; cyclic loading; load test; monotonic loading; test load magnitude; test protocol.

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CODE**COMMENTARY****CHAPTER 1—GENERAL****R1—GENERAL****1.1—General**

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

1.1.2 This code supplements and is part of the “Code Requirements for Evaluation, Repair, and Rehabilitation of Existing Concrete Buildings (ACI 562-13) and Commentary” through reference.

1.2—Scope

1.2.1 The requirements of this code shall govern for the evaluation of safety and serviceability of members in existing concrete structures by load testing.

1.2.2 The requirements of this code shall apply to reinforced concrete with prestressed reinforcement, nonprestressed reinforcement, or both.

1.2.3 Procedures and requirements provided in this code are not applicable to existing structures having concretes with compressive strengths above 8000 psi unless permitted by the licensed design professional.

1.2.4 For structures being erected under the requirements of a legally adopted general building code, of which ACI 318-11 forms a part, this standard shall not replace Chapter 20 of ACI 318-11.

1.3—Purpose

1.3.1 The purpose of this code is to establish the minimum requirements for the test load magnitudes, load test procedures, and acceptance criteria applied to existing concrete structures as part of an evaluation of safety and serviceability to determine whether an existing structure requires repair and rehabilitation, to verify the adequacy of repair and rehabilitation measures applied to an existing structure, or to provide for public health and safety through structural safety and serviceability.

1.3.2 Load tests shall be conducted according to load test procedures as described in Chapter 5.

R1.1—General

R1.1.2 Through its reference by ACI 562-13, this code is to be used only when ACI 562-13 governs. In those cases in which the general building code governs, then the applicable provisions of Chapter 20 of ACI 318-11 dealing with load testing are to be used.

R1.2—Scope

R1.2.1 The determination of situations where a load test is required is outside the scope of this code. Furthermore, this code does not address procedures for analytical strength evaluations, condition evaluation of existing structures, or assessment of structural deterioration and its consequences. The licensed design professional should advise the owner and parties participating in the load testing of a structure of the potential for damage or even failure of the portions of the structure to be load tested in accordance with the procedures of this code. Refer to 5.1 for provisions relating to safety and shoring.

R1.2.4 Experience is lacking in the application of the procedures and requirements in this code to structures having high-strength concrete (concrete compressive strengths over 8000 psi). Structures with high-strength concrete may exhibit a more linear response as the structure approaches its load-carrying limit and may experience a more brittle failure in comparison to structures with strengths less than 8000 psi.