
BUILDINGS BULLETIN 2012-007
OTCR

Supersedes: None

Issuer: Alan Price, P.E.
Director, Office of Technical Certification and Research

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Purpose: This document establishes acceptance criteria for post-installed anchors in masonry in accordance with the 2008 NYC Construction Codes.

Related Code AC 28-113.2.2
Section(s): BC 1604.2

BC 1704.13

Subject(s): Masonry, anchors, post-installed; Scaffolds, anchors; Post-installed anchors, expansion anchor; Post-installed anchors, adhesive anchor; Post-installed anchors, predrilled fasteners; Masonry anchors, field testing

Background: Section 1604.2 of the NYC Building Code requires loads and forces for occupancies and uses not covered in such chapter to be subject to the approval of the commissioner. Since the 2008 NYC Construction Codes do not reference criteria for post-installed anchors in masonry, this document is intended to establish acceptance criteria for three types of post-installed anchors in masonry, including those used for securing scaffolds to buildings.

Description:

1. Expansion Anchor- A mechanical fastener placed in assembled masonry, designed to expand in a self-drilled or predrilled hole of a specified size and engage the sides of the hole in one or more locations to develop shear and/or tension resistance to applied loads without grout, adhesive or dry pack.
2. Adhesive Anchor- A device for transferring tension and shear loads to structural masonry, consisting of an anchor element embedded with an adhesive compound in a cylindrical hole drilled in a masonry member.
3. Predrilled Fasteners (screw anchors)- A threaded mechanical fastener made of hardened steel placed in assembled masonry with a predrilled hole of lesser size diameter than that of the anchor, designed to develop shear and/or tension resistance to applied loads without grout, adhesive or dry pack.

Uses: Post-installed anchors in masonry can be used to support all loading conditions in accordance with an applicable evaluation report when anchors are selected as a result of structural design.

Restriction:

Adhesive anchors are not permitted to support fire-resistance rated construction.

Evaluation 2008 NYC Construction Codes
Scope:

Evaluation Pursuant to section AC 28-113, the Office of Technical Certification and Research (OTCR) recognizes post-installed anchors in masonry elements designed and installed in accordance with:

Criteria:

1. ICC-ES AC01 "Acceptance criteria for expansion anchors in masonry elements"¹, or
2. ICC-ES AC58 "Acceptance criteria for adhesive anchors in masonry elements"², or
3. ICC-ES AC106 "Acceptance criteria for predrilled fasteners (screw anchor) in masonry"³.

Other alternative criteria for post-installed anchors in masonry shall be approved by the department.

Acceptable post-installed anchors in masonry elements shall have an evaluation report issued in accordance with applicable acceptance criteria and shall comply with the conditions of this bulletin.

Conditions of Acceptance: Post-installed anchors in masonry shall be designed, installed, tested and inspected in accordance with the 2008 NYC Construction Codes and other applicable provisions including but not limited to the following:

A. Design

Post-installed anchors in masonry shall be designed by a registered design professional in accordance with the provisions of the 2008 NYC Construction Codes and the applicable acceptance criteria of this bulletin.

B. Installation

Installation of post-installed anchors in masonry shall be in accordance with the manufacturer's instructions, the 2008 NYC Construction Codes, the applicable evaluation report, and the conditions of this bulletin.

C. Field testing

Field test shall be performed where required by the anchor manufacturer or where the structural properties of the masonry are in doubt as determined by the registered design professional.

1. Objective. Proof load testing (field testing) shall be used to verify allowable load capacities listed in the evaluation report published for the anchor.
2. Location. Post-installed anchors used for proof loading of anchors in masonry shall be installed in the same manner and using the same base materials as will be used in the actual installation.
3. Testing Personnel. Field testing shall be performed by a representative of the anchor manufacturer and witnessed by a special inspector as defined in section (D) (1) of this Bulletin.
4. Sample size. A minimum of three tests for each anchor size and type shall be performed for each class of masonry in which they are proposed to be used. All three anchors must pass the test. See section (C)(5)(iii) for requirements for anchors not meeting proof load.
5. Proof loading. The following shall be required for all testing:
 - i. Anchors shall be tested under tensile load.
 - ii. Proof load shall be established by doubling the allowable load listed in the applicable evaluation report.
 - iii. The registered design professional shall be notified if an anchor fails under a load which is below the established proof load. In such case, anchors shall not be used until the registered design professional submits an updated anchorage plan.
6. Test report. Each field test report shall include the following:
 - i. Test location shall be clearly identified for each anchor.
 - ii. The masonry wall condition shall be documented. Include such details as approximate age of the masonry wall, type of masonry (i.e., solid brick, hollow CMU, etc.), conditions of the mortar joints, etc.
 - iii. Anchorage geometry including diameter, embedment, spacing between tested anchors (if closer than 4x embedment depth), and edge distances (if closer than 2x embedment depth).
 - iv. Applied load and expected proof load as established per this Bulletin (section (C)(5)(ii)).
 - v. Field test reports shall be forwarded to the registered design professional within 3 days of the test. The special inspector shall maintain test reports for at least 6 years as required by 1 RCNY 101-06 (b) (4).

D. Inspection

1. Pursuant to section BC 1704.13, the installation of post-installed anchors in masonry shall be subject to special inspection requirements of Chapter 17 of the Building Code and 1 RCNY section 101-06. Special Inspectors of post-installed anchors in masonry shall:
 - a. Maintain the same qualification requirements for the “Masonry” category as defined in 1 RCNY section 101-06, Appendix A;
 - b. Have duties and responsibilities in accordance with, but not limited to, the evaluation report issued for the installed product. Special inspectors shall also witness field testing; and
 - c. Complete the statement of special inspection by referencing this bulletin under the Special Inspection Item for “Alternative Materials” in section 3.0 of the TR1 form.

<input type="checkbox"/>	<input type="checkbox"/>	Wood - Installation of Metal-Plate-Connected Trusses	BC 1704.6.3		
<input type="checkbox"/>	<input type="checkbox"/>	Wood - Installation of Prefabricated I-Joists	BC 1704.6.4		
<input type="checkbox"/>	<input type="checkbox"/>	Soils - Site Preparation	BC 1704.7.1		
<input type="checkbox"/>	<input type="checkbox"/>	Soils - Fill placement & In-Place Density	BC 1704.7.2, BC 1704.7.3		
<input type="checkbox"/>	<input type="checkbox"/>	Soils - Investigations (Borings/Test Pits)	TR4 BC 1704.7.4		
<input type="checkbox"/>	<input type="checkbox"/>	Pier Foundations & Drilled Pier Installation	TR5 BC 1704.8		
<input type="checkbox"/>	<input type="checkbox"/>	Pier Foundations	BC 1704.9		
<input type="checkbox"/>	<input type="checkbox"/>	Underpinning	BC 1704.9.1		
<input type="checkbox"/>	<input type="checkbox"/>	Wall Panels, Curtain Walls, and Veneers	BC 1704.10		
<input type="checkbox"/>	<input type="checkbox"/>	Sprayed Fire-Resistant Materials	BC 1704.11		
<input type="checkbox"/>	<input type="checkbox"/>	Exterior Insulation Finish Systems (EIFS)	BC 1704.12		
<input type="checkbox"/>	<input type="checkbox"/>	Alternative Materials - OTCR Buildings Bulletin # 2012-007	BC 1704.13		
<input type="checkbox"/>	<input type="checkbox"/>	Smoke Control Systems	BC 1704.14		
<input type="checkbox"/>	<input type="checkbox"/>	Mechanical Systems	BC 1704.15		
<input type="checkbox"/>	<input type="checkbox"/>	Fuel-Oil Storage and Fuel-Oil Piping Systems	BC 1704.16		
<input type="checkbox"/>	<input type="checkbox"/>	High-Pressure Steam Piping (Welding)	BC 1704.17		
<input type="checkbox"/>	<input type="checkbox"/>	Fuel-Gas Piping (Welding)	BC 1704.18		
<input type="checkbox"/>	<input type="checkbox"/>	Structural Safety - Structural Stability	BC 1704.19		
<input type="checkbox"/>	<input type="checkbox"/>	Mechanical Demolition	BC 1704.19 BC 3306.6		

Referenced Standards:

1. AC01-2010 “Acceptance criteria for expansion anchors in masonry elements”. www.icc-es.org
2. AC58-2011 “Acceptance criteria for adhesive anchors in masonry elements”. www.icc-es.org
3. AC106-2010 “Acceptance criteria for predrilled fasteners (Screw anchor) in masonry”. www.icc-es.org