

4. Anchors supporting safety related mechanical, electrical or plumbing items such as sprinkler systems, heavy suspended pipes or barrier rails. Other mechanical, electrical or plumbing installations are not subject to the requirements of ACI 318 D.9.2.2 through D.9.2.4 or this bulletin.

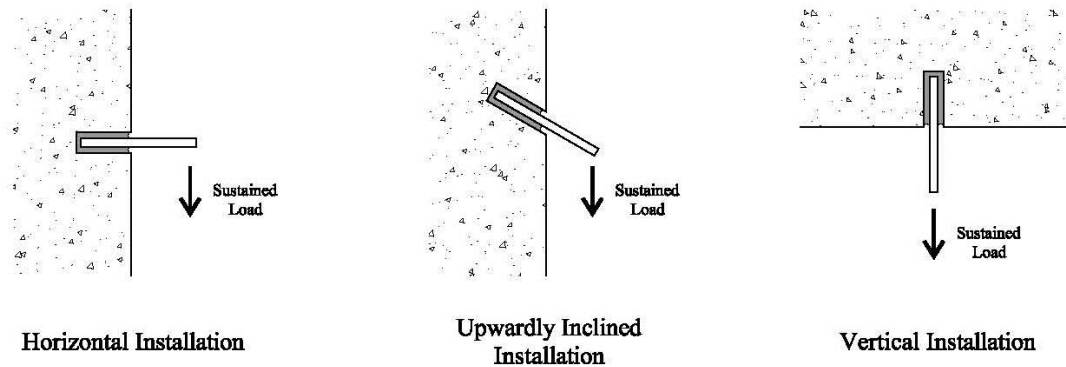


Figure I – Anchor orientation installations subject to the requirements of this bulletin

B. Certified installers. ACI 318 D.9.2.2 requires adhesive anchors installed horizontally or upwardly inclined and supporting sustained tension loads to be installed by certified personnel. Installers must be certified through the ACI/CRSI Adhesive Anchor Installer Certification program or equivalent.

C. Alternative procedures for installer certification requirements. As an alternative to certified personnel in accordance with Section B of this bulletin, adhesive anchoring systems identified in Section A of this Bulletin shall be accepted if (a) explicitly qualified in accordance with Buildings Bulletin 2014-018 through an evaluation report based on ACI 355.4 or ICC-ES AC308 for horizontal or upwardly inclined positions when anchors are supporting sustained tension loads, (b) installers are trained under a manufacturer-based installation training program covering the proper installation techniques for specific applications to be encountered under part A of this Bulletin, and (c) proof load tested in accordance with the following procedures. The alternative procedures identified in this bulletin will not be accepted in lieu of certified personnel after September 10, 2017.

1. Sample size. A minimum of 20% or three tests, whichever is greater, shall be randomly selected and tested for each of the following conditions:
 - i. Adhesive type.
 - ii. Anchor size.
 - iii. Embedment depth.
 - iv. Specified concrete compressive strength.
 - v. Installer working shift.
2. Testing Personnel. Proof load testing shall be performed by a special inspector or an independent testing agency employed by the owner or owner's representative.
3. Special Inspector Qualifications and Responsibilities. Special inspector qualifications shall be in accordance with BC 1704.32 and 1 RCNY 101-06 Appendix A.
 - i. Anchor proof load tests shall be witnessed by special inspectors in accordance with special inspection requirements of the NYC Building Code and 1 RCNY 101-06.
 - ii. Special inspection agency shall prepare the test report required in Section (B)(6) of this Bulletin.
4. Applied proof loading. The following shall be required for all testing:
 - i. Testing shall only be performed on adhesive anchoring systems installed in accordance with the Manufacturer's Published Installation Instructions (MPII)
 - ii. Anchors shall be subjected to confined tension tests.
 - iii. Proof loads shall be established in accordance with the following:
 - a. Unless otherwise directed by the engineer or design professional of record, proof loads shall be applied as confined tension tests. Proof loads shall not

exceed the lesser of 67 percent of the load corresponding to the nominal bond strength as calculated from the characteristic bond stress for uncracked concrete modified for edge effects and concrete properties or 80 percent of the minimum specified anchor element yield strength ($A_{se,N} * f_{ya}$).

- b. For anchors located close to edges, proof loads shall be adjusted as appropriate to avoid edge distance breakout failure. For closely spaced adjacent anchors proof loads shall be adjusted as appropriate to avoid premature failure.
 - c. The required proof loading for anchors installed under continuous special inspection performed in accordance with an evaluation report may not be used to satisfy the requirements of this bulletin unless all requirements from this bulletin are duplicated in the continuous special inspection proof loading program.
5. Acceptance Criteria.
- i. Anchors shall resist the applied proof load (section (B)(4)(iii)) for duration of one minute without visual movement of the anchor or reduction on applied load as measured by test gauges.
 - ii. The registered design professional who designed and specified the anchoring system(s) shall be notified immediately if an anchor fails to satisfy the criteria in section (B)(4)(iii) of this bulletin. In such case, anchors in the subject sample size shall not be loaded until authorized by the registered design professional of record.
6. Test report. Each field test report shall include the following:
- i. Test location shall be clearly identified for each anchor.
 - ii. The substrate condition shall be documented. Include such details as approximate age, exposure to exterior elements, orientation, etc.
 - iii. Name and manufacturer of adhesive(s).
 - iv. Installation conditions including ambient air temperature and hole cleaning method.
 - v. The power tool (brand, model number and size), drill-bit (type and diameter), and the drilling mode (e.g. rotation only or hammering with rotation).
 - vi. Anchorage geometry including diameter, embedment, spacing between tested anchors (if closer than 4x embedment depth), and edge distances (if closer than 2x embedment depth), relative anchor orientation referenced from downward vertical.
 - vii. Applied load and expected proof load (established per section (B)(3)(ii) of this bulletin).
 - viii. Field test reports shall be prepared by the testing agency and signed by the special inspection agency. The special inspection agency shall forward the report 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. Special inspection requirements for adhesive anchoring systems subject ACI 318 D.9.2.4. Special inspection for adhesive anchors subject to installation by certified installers or in accordance with Section B of the Bulletin must be performed in accordance with the following:

1. Compliance. Anchors shall be continuously inspected in accordance with ACI 318 D.9.2.4, 1 RCNY 101-06.
2. Inspection frequency. Anchors shall be subject to continuous inspection in accordance with ACI 318 D.9.2.4.
3. Statement of Special Inspection. Registered primary or technical directors shall complete the TR1 form using the category "Post-installed Anchors – BC 1704.32" to identify responsibility and certify the inspection.