



Building Codes Division

Policies and Procedures

POLICY NUMBER: 08-01

SUBJECT: *Use of Post-Installed Anchors in Concrete*

CODE SECTION: *Oregon State BCD May 7, 2008, Interpretations*

EFFECTIVE DATE: *May 7, 2008*

REVISED DATE: *July 30, 2008*

REFERENCE: *2006 IBC AND ACI 318-05 APPENDIX CHAPTER "D".*

ISSUE: *Criteria for the installation of post-installed fasteners in concrete under 2006 IBC regulations and May 7, 2008 State BCD Interpretations.*

POLICY: On May 7, 2008, State of Oregon Building Codes Division (OR BCD) issued State-wide interpretations concerning the criterion that needs to be met before allowing the use of post-installed fasteners in concrete. These interpretations raised certain questions regarding some of its provisions. Clarification regarding the intent of such provisions was obtained from various sources and, based on the input received following policy is adopted by the Clackamas County Building Codes Division regarding allowing the use of post-installed fasteners in concrete:

POWER-ACTUATED FASTENERS (PAF)

- a) Current ICC ES approval for the proposed PAF is required. Applicant to provide a copy of the ES approval report or to specify details of the proposed PAF product on the design documents so that its ICC-ES approval can be verified by Clackamas County staff during plan-review stage. None of the PAF's is approved for earthquake-loading (direct tension).
- b) PAF's are not to be used in seismic load applications but, are allowed in shear and gravity load applications. So, for a suspended ceiling application, PAF can be used to attach hanger wires to concrete deck above but, PAF can-not be used to attach Splay-Wires to the concrete deck above. Tension force generated in hanger wire attachment is small enough to be considered negligible for any concerns.

- c) Minimum spacing required for PAF need to be as per their manufacturer listing (generally 4 inches) but, a minimum of 3 PAF per application are required according to OR BCD.
- d) Use of PAF for connecting Exterior Walls {of 15 psf or less steel/ wood light-frame walls} to Concrete is allowed in Shear application only.
 For buildings that are 4 stories or more only 20% (1/5th) of the PAF listed load capacity is to be recognized for design purposes.
 For buildings that are 3 stories or less in height a maximum of one-half of the PAF's listed load carrying capacity is to be recognized for design purposes.
 Design calculations are required in all cases.
 For structures that are exempt from the State Engineers Law (ORS 672), design calculations are not required to be prepared by an Oregon licensed Engineer as long as engineering is not performed as defined in Oregon Board of Engineers rules.
- e) Use of PAF for connection of Interior Walls to concrete floor (in buildings of any height) is allowed provided a maximum of one-half of the PAF listed load capacities is used. So, for a typical Steel Stud interior wall 10 feet in height and provided with one layer of Gyp Board on both sides of the interior wall, a spacing of 12-inches on center between PAF would be acceptable for the most PAF's.
 If the interior wall is provided with two layers of Gyp Board on both sides of the wall (typically a 2-hour-rated fire-wall), the spacing of PAF for such interior wall's connection to concrete floor would be reduced to 6-inches on-center.
 For situations where different conditions exist for interior walls, spacing of PAF would need to be calculated based on site specific conditions.
 For the use of PAF in Interior Wall construction, submission of engineering design is not required since a redundancy in the design is already built by reducing PAF's listed load capacity by one-half.

SCREW ANCHORS

- a) Screw Anchors that are 1/4" or less in diameter are not allowed to be used in seismic applications.
- b) Screw Anchors 3/8" or more in diameter are allowed to be used in seismic application provided certain conditions (listed below) are met.
- c) As of now, none of the manufacturers have an ICC-ES approval report for conformance with the 2006 IBC/ 2005 ACI 318 Appendix Chapter D requirements.
- d) For Screw Anchors (3/8" or more in diameter) that have approval under ICBO/ Legacy Codes/ 2000 IBC , their use is allowed provided only one-half of their listed value is used for design purposes.
- e) For Screw Anchors (3/8" or more in diameter) that have tested their products under 2003/ 2006 IBC and are waiting for ICC-ES review and

approval, their use is allowed provided only 80% of their listed value is used for design purposes.

- f) Since a redundancy in the design loads is already created by allowing their use based on reduced load capacities, special Inspections shall only be required if required in the ICC ES approval report for the product listing and as per IBC requirements.

Design calculations are required. For structures that are exempt from the Oregon State Engineers Law (ORS 672), design calculations are not required to be prepared by an Oregon licensed Engineer as long as engineering is not performed as defined in Oregon Board of Engineers rules.

ADHESIVE ANCHORS

- a) As of now only one product: HILTI 500 is available in the market that is approved by ICC-ES to have met the 2006 IBC and 2005 ACI 318 Appendix Chapter D requirements.
- b) Other manufacturers have completed their third party testing per the new criteria and are waiting for ICC-ES review and listing. However, ICC-ES is reporting a backlog of work and anticipates some delay in the issuance of the same.
- c) OR BCD previous position was that continued use of Adhesive Anchors be allowed provided a redundancy is built into their design by allowing reduced load values. OR BCD intends to continue with this same approach as is evidenced by their August 7, 2008 memo to the Building Codes Structures Board for board's approval to the continuation of this approach.
- d) So, for Adhesive Anchors that have approval under ICBO/ Legacy Codes/ 2000 IBC, their use is allowed provided only one-half of their listed value is used for design purposes.
- e) And, for Adhesive Anchors that are tested under 2003/ 2006 IBC and are waiting for ICC-ES review and approval, their use is allowed provided only 80% of their listed value is used for design purposes.
- f) Since a redundancy in the design loads is already created by allowing their use based on reduced load capacities, special Inspections shall only be required if required in the ICC ES approval report for the product listing and as per IBC requirements.