

State of Oregon
Building Codes Division

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Statewide Alternate Method OSSC No. 08-02

(Ref.: ORS 455.060)

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POWER ACTUATED FASTENERS
Oregon Structural Specialty Code, Section 1613.1

Statewide Alternate Methods are approved by the Division administrator in consultation with the appropriate advisory board. The advisory board's review is limited to the technical and scientific merits of the proposal. In addition:

- *building officials shall approve the use of any material, design or method of construction addressed in a statewide alternate method,*
- *the decision to use a statewide alternate method is at the discretion of the designer,*
- *Statewide Alternate Methods do not limit the authority of the building official to consider other proposed alternate methods encompassing the same subject matter*

Requested by: Oregon Building Codes Division

Purpose:

To allow the continued use of Power Actuated Fasteners in certain seismic applications subject to specified limitations, increased factors of safety and redundancy of fasteners installed.

Background:

Beginning with the 2003 International Building Code (IBC), the use of all post-installed anchors in concrete came under increased scrutiny. The IBC references ACI 318, Appendix D as the appropriate standard for anchors.

Consistent with the IBC's "strength design" methodology, Appendix D requires the design consider nominal tension and shear strength values for post-installed mechanical anchors used in cracked and un-cracked concrete. In contrast, previous codes utilized the "allowable stress design" methodology, which considered the use of post-installed anchors in un-cracked concrete only.

While the International Codes Council Evaluation Service lists several valid reports for Power Actuated Fasteners (PAF), none consider their use in cracked concrete and they

are listed for non-seismic applications. Due to the inherently small diameters of PAFs, they cannot comply with the new requirement for testing in cracked concrete.

This alternate method will allow the continued use of PAFs in certain seismic applications subject to specified limitations, increased factors of safety and redundancy of PAFs installed. For the specific use of PAFs in conjunction with suspended ceilings, please reference the following link:

<http://www.oregonbcd.org/programs/structural/interps/OSSC1621.pdf>

The scientific and technical merits of this alternate method have been reviewed by the Building Codes Structures Board.

Applicable Code Citation

2007 Oregon Structural Specialty Code, section 1613.1

Statewide Alternate Method:

Power Actuated Fasteners (PAF). PAFs may be used in seismic applications subject to the following:

1. Must have current ICC-ES report
2. Cannot be used in tension
3. Redundancy required. Minimum 3 PAFs installed in any application. Minimum spacing shall be per PAF listing
4. Exterior walls four stories or greater;
 - a. Limited to 15#/psf or less
 - b. Increase factor of safety to 5:1 (20% of the listed value)
5. Exterior walls 3 stories or less;
 - a. Limited to 15#/psf or less
 - b. Increase factor of safety to 2:1 (50% of the listed value)
6. Interior walls;
 - a. Increase factor of safety to 2:1 (50% of the listed value)
7. Engineering design calculations must be submitted
8. This alternate method will be reviewed in conjunction with the adoption of the 2010 Oregon Structural Specialty Code

The recommendation and findings of the Building Codes Structures Board are accepted and are adopted:

Mark Long, Administrator
Building Codes Division

May 7, 2008
Date