

ICC TRI-CHAPTER UNIFORM CODE COMMITTEE (TUCC)



POLICY NUMBER: 12

APPROVAL DATE: September 19, 2024 (Previous approvals: 04/14/11, 03/08/12, 04/11/13, 03/13/14)

SUBJECT: Shear Wall Continuous Tie-Down Systems

This guideline is developed by the Tri-chapter Uniform Code Committee and is intended to enhance regional consistency in application and enforcement of the Building Code. Please verify acceptance of this guideline with your local building department prior to its application.

BACKGROUND:

In recent years engineered tie-down anchoring systems for wood shear walls have been utilized on multi-level wood framed buildings. These innovative anchorage systems typically consist of a continuous rod or cable, plate, cage and shrinkage compensating device. There are no industry standards for design, detailing or installation of these systems. Understanding the design and detailing of the anchorage components by different manufacturers would help establish and ensure proper installation of safe and reliable systems in buildings.

ISSUE:

Cities and counties in the ICC Tri-chapter area do not have a uniform policy or guideline for plan review and inspection of various wood shear wall continuous tie-down systems. As a result, jurisdictions are enforcing different requirements.

PROPOSED GUIDELINE:

Tie-down anchoring devices based on rods or cables are allowed to be installed in multi-story wood framed buildings of any height and number of stories permitted by the California Building Code (CBC) when the following conditions are satisfied.

1. A complete design with calculations shall be submitted demonstrating that shear wall drift and the applied loads per the current CBC can be transferred through all components of the tie-down anchoring system from the shear wall to the foundation or rigid base below.
2. Total Vertical Movement: Maximum total vertical movement shall not exceed 0.2 inch between connectors/restraints (Allowable Stress Design). The accumulation of the vertical movement shall include rod or cable elongation, bearing plate-grain deformation,

looseness due to take up/shrinkage compensation devices, and other components of the tie-down system resisting the uplift forces. Shear wall drift limit calculations shall consider the 0.2 inch vertical displacement limit. This 0.2-inch vertical displacement limit may be exceeded when it can be demonstrated that the shear wall story drift limit and the deformation compatibility requirements of CBC Section 1604.4 are met when considering all sources of vertical displacement.

3. Combining and/or mixing continuous tie-down systems and conventional hold-downs within a common shear wall is prohibited.
4. All plans and calculations for the tie-down system shall bear the stamp and signature of a civil or structural engineer licensed by the State of California.

CODE REFERENCE(S): 2022 California Building Code Chapters 16 and 23