



## ***Shear Wall Continuous Tie-Down Systems***

The City of Walnut Creek has adopted the following guidelines developed by the ICC Tri-Chapter Uniform Code Committee.

### 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.

### Code References

2013 CBC Chapters 16 and 23

### Adopted Guidelines

The use of tie-down anchoring devices based on rods or cables are allowed to be installed in the 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. Complete design including shear wall drift and corresponding calculations demonstrating that the applied loads per the current CBC can be transferred through all components of the tie-down anchoring components from the shear wall to the foundation or the rigid base shall be submitted for review.
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 of 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.