

California Earthquake Authority

Dwelling Retrofit Verification Requirements

I. Purpose and General Requirements

This document is intended for use by engineers and contractors in completing and signing a CEA Dwelling Retrofit Verification (“DRV”) form.

The California Earthquake Authority (“CEA”) provides earthquake-insurance-premium discounts to owners of older houses who have retrofitted their houses to reduce earthquake damage by securing the house to the foundation with bolts and/or sill plate anchors, installing cripple wall bracing where cripple walls are present, and securing the water heater to the building frame. The residential structure on a property, commonly referred to as a “house,” will be referred to as the “dwelling” from this point forward in this bulletin.

To receive the retrofit discount, policyholders are required to submit a CEA Dwelling Retrofit Verification (“DRV”) form. Such licensed contractors or registered engineers will sometimes be referred to collectively as “Professionals” in this bulletin.

The purpose of the DRV form is to verify that the retrofit work has actually been performed and that it appears to be in compliance with modern bolting and bracing standards, in the form of one or more of the “Referenced Codes” listed in Section II, below. If a Professional is able to verify, in accordance with the procedures stated in this bulletin, that the retrofit work was in fact performed in compliance with the Referenced Codes, then the dwelling will be deemed to be in compliance with these Dwelling Retrofit Verification Requirements (the “Requirements”).

The signer of the DRV form is not representing that they have evaluated the level of quality or workmanship of the retrofit work, nor are they certifying or warranting the expected seismic performance of the retrofit or of the retrofitted dwelling.

While some policyholders may be in a position to have the engineer that designed the retrofit (the “engineer of record”) or the contractor that performed the retrofit work (the “contractor of record”) sign the form, other policyholders may need to use a Professional who was not involved in the retrofit project. This bulletin is intended to outline the level of assessment expected of the Professional signing the form.

Homeowners and Professionals participating in the DRV process are required to agree to and adhere to the full requirements of this bulletin.

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By signing the CEA DRV form, the Professional is stating that the retrofit is in accordance with one or more of the Referenced Codes. The Professional must refer to the Inspection Requirement Table below to determination whether a physical inspection of the dwelling and the retrofit will be required:

INSPECTION REQUIREMENT TABLE

Professional	When inspection is NOT required:	When inspection IS required:
Engineers	<ul style="list-style-type: none"> • The DRV is signed within 10 years after completion of the retrofit; and • The signer is the engineer of record; and • The signer confirms that the retrofit was designed and constructed in accordance with one or more of the Referenced Codes. 	<ul style="list-style-type: none"> • The signer is the engineer of record, but the DRV is signed more than 10 years after the completion of the retrofit; or • The signer is not the engineer of record.
Contractors	<ul style="list-style-type: none"> • The DRV is signed within 10 years after completion of the retrofit; and • The signer is the contractor of record; and • The signer confirms that the retrofit was constructed in accordance with construction documents that specifically referenced one or more of the Referenced Codes in the scope of work. 	<ul style="list-style-type: none"> • The signer is the contractor of record, but the DRV is signed more than 10 years after the completion of the retrofit; or • The signer is not the contractor of record.

If an inspection is required, then in order to sign the CEA DRV form, the signer must perform the Inspection and Assessment Process below (Section III) and must determine that the retrofit appears to be in accordance with one or more of the Referenced Code (Section II).

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II. Referenced Codes

In order for a dwelling to be in conformance with the Requirements, the following must have been completed in accordance with one or more of the following standards (the "Referenced Codes"):

A. Foundation/Cripple Wall retrofit:

The retrofit provisions for sill plate anchorage and cripple wall bracing in one of the following:

- 1997 Uniform Building Code (UBC)
- 1997 Uniform Code for Building Conservation (UCBC)
- 2000 International Building Code (IBC)

OR

- California Building Code (CBC) Appendix Chapter A3 (latest edition)
- Standard plan set adopted by the local building department as construction documents in conformance with CBC Appendix Chapter A3:
 - ✓ Plan Set A
 - ✓ Los Angeles Standard Plan Set #1
 - ✓ FEMA Plan Set (FEMA DR-4193 RA2)

For a retrofit to be in conformance with one of the Referenced Codes, the sill plate anchorage AND cripple wall bracing (if cripple walls exist) must have been retrofitted. The DRV form only covers the walls surrounding the crawlspace of a dwelling. An assessment of the superstructure (portion of dwelling above the lowest framed floor) is not required.

B. Water Heater Bracing

Water heater installation must be in compliance with California Health and Safety Code sections 19210-19217, which provides, in relevant part (in subdivision (a) of section 19211), as follows: "[A]ll new and replacement water heaters, and all existing residential water heaters, shall be braced, anchored, or strapped to resist falling or horizontal displacement due to earthquake motion. At a minimum, any water heater shall be secured in accordance with the California Plumbing Code, or modifications made thereto by a city, county, or city and county pursuant to Section 17958.5."

This requirements document acknowledges that there may be other seismic deficiencies present in the subject property such as, for example, unreinforced masonry chimneys, excessive wall openings, or a living-space-over-garage condition. The DRV form does not cover any other seismic deficiencies other than sill bolting, cripple wall bracing, and water-heater bracing, nor does the DRV form make any statement as to the expected seismic performance of the dwelling.

While the CEA DRV process is designed to promote standards that lessen the potential for damage to dwellings during an earthquake, the CEA does not warrant the accuracy, completeness, suitability, or utility of these Referenced Codes.

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III. Inspection and Assessment Process

If, in accordance with the Inspection Requirement Table on page 2 of these Requirements, a physical inspection of the retrofit is required, then in order to sign the CEA DRV form the Professional must complete the following Inspection and Assessment Process, which includes a General (Qualifying Structure) Inspection and a Retrofit Assessment, conducted in accordance with the Observation and Testing Requirements, as follows:

A. General (Qualifying Structure) Inspection.

The Professional must examine the dwelling to determine that it meets the following requirements, in order to confirm that the dwelling is the type of structure that might qualify for the CEA retrofit discount program:

1. The dwelling was built prior to 1980
2. The dwelling is a residential structure of one to four dwelling units
3. The dwelling has three or fewer stories
4. The dwelling has a raised concrete or reinforced masonry perimeter foundation
5. The dwelling is of wood-frame construction
6. The dwelling has a crawlspace, or a full or partial basement. (NOTE: In addition to the crawlspace/basement, the dwelling may also have other areas with a partial slab-on-grade foundation, such as, for example, an attached garage or a later room addition on a slab foundation.)

B. Retrofit Assessment (primary focus on the crawlspace area).

The Professional must visually examine the retrofit to verify that the retrofit was performed in accordance with one or more of the Referenced Codes:

1. The number of stories must be inspected by a Professional as follows:
 - a. For dwellings with fewer than three stories, and for three-story dwellings with cripple wall studs that do not exceed 14 inches in height, the inspection may be performed by either a contractor or civil or structural engineer licensed in California.
 - b. For dwellings with more than three stories, and for three-story dwellings with cripple wall studs exceeding 14 inches in height, the inspection must be performed by a California registered civil or structural engineer.
2. If the dwelling has cripple walls, the cripple walls are to be inspected by a Professional as follows:
 - a. For dwellings with cripple walls of four feet or less in height, the inspection may be performed by either a contractor or civil or structural engineer licensed in California.
 - b. For dwellings with cripple walls greater than four feet in height, the inspection must be performed by a California registered civil or structural engineer. (Exception: If the retrofit is in accordance with FEMA Plan Set (FEMA DR-4193 RA2) the verification form may be signed by a licensed contractor or engineer.)

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3. Sill plate anchorage – All perimeter wall sill plates have been bolted to the foundation with chemical anchors, expansion bolts, or approved foundation plates at the approved size and spacing.
4. Cripple wall bracing where dwelling has cripple walls – Plywood or OSB has been installed with appropriate:
 - a. Sheathing thickness
 - b. Sheathing length
 - c. Sheathing nailing (size and spacing)
5. Floor to cripple wall or mudsill connection: All perimeter walls have top of cripple wall or mudsill connections to the floor framing that have been installed with approved size and spacing:
6. Ensure clip angles and/or Simpson H10 (as allowed by Plan Set A) securely fasten first floor framing to the cripple wall bracing.
7. Hold downs: If hold downs are required by either an engineered design or the FEMA Plan Set, they were installed with appropriate size and location.

C. Observation and Testing Requirements for Inspections

1. The Professional must conduct a visual observation of the seismic strengthening system to determine general conformance to one or more of the Referenced Codes.
2. The assessment must also include a visual confirmation that no significant deterioration of structural materials has occurred.
3. No destructive testing is required unless:
 - a. The perimeter walls of the crawl space or basement have been covered with gypsum wallboard, plaster, or any other finish material that does not allow for observation of plywood or OSB sheathing, or
 - b. No sill plate anchors or wall/mudsill to floor connectors of any kind are visible.
4. Destructive testing to observe wall sheathing, sill plate anchors, or wall/mudsill to floor connectors may be limited to spot inspections at a minimum of two locations along each perimeter wall. If required, bolt locations behind sheathing may be determined by pachometer, flexible inspection cameras, notching the sheathing (see LA Standard Plan Set #1), drilling approved vent holes, or other non-destructive means.
5. No material testing is required (concrete compression tests, anchor bolt torque tests, etc.) unless the Professional believes that any of the concrete, metal, or wood elements have been damaged or have deteriorated significantly from the condition that likely existed during design and construction.