

**Simplified Seismic Assessment Form**  
**For Detached, Single-Family, Wood-Frame Dwellings**

(Please print all information)

**Grade**

Street Address \_\_\_\_\_

Community/Area/City \_\_\_\_\_

ZIP Code \_\_\_\_\_

Date \_\_\_\_\_

Owner \_\_\_\_\_

Inspector \_\_\_\_\_

Inspection Form # (optional) \_\_\_\_\_

For each question, circle only one answer. Circle the one with higher penalty if more than one answer applies. Exception: question B-1

**A. Foundation** (If the dwelling has a crawl space, the inspector should view all the areas that are accessible.)

	<u>Penalty</u>		<u>Penalty</u>
*A-1 The exterior footing is:		*A-5 At the dwelling perimeter walls, where the foundation system supports a wood framed floor:	
a. continuous concrete or reinforced masonry	[0]	a. the foundation sill plate (mudsill) is bolted to the foundation with average anchor bolt spacing of 72 in. or less	[0]
b. other footing conditions	[4.2]	b. the foundation sill plate is fastened to the foundation with retrofit anchors equivalent to 72 in. or less anchor bolt spacing	[0]
A-2 The lowest floor of the dwelling is:		c. the anchor bolts have average spacing that is > 72 in. but <= 108 in.	[1.7]
a. slab-on-grade	[0]	d. the anchor bolts have > 108 in. average spacing	[4.6]
b. wood framed over crawl space or basement	[2.9]	e. the foundation sill plates have extensive decay, splitting, or inadequate edge distance at one-third or more of the anchor bolt locations such that significant slip of the sill plate could occur	[10.0]
c. combination of slab-on-grade and wood framed floor over crawl space or basement	[2.9]	f. the anchor bolts have significant corrosion at one third or more of the anchor bolt locations such that significant slip of the sill plate could occur	[10.0]
*A-3 At the dwelling crawlspace or basement interior, the lowest floor framing is supported on:		g. there are no foundation anchor bolts	[15.0]
a. continuous stem walls or a combination of continuous stem walls and beams on posts bearing on concrete footings/piers	[0]	h. there are no foundation sill plates to connect to the foundation	[15.0]
b. beams on posts bearing on piers/pad footings	[0.8]	i. not applicable	[0]
c. beams on posts supported directly on soil	[2.2]		
d. not applicable: slab-on-grade	[0]	<b>Total</b>	<div style="border: 1px solid black; width: 40px; height: 20px;"></div>
A-4 For a foundation on a slope of 3 horizontal to 1 vertical or steeper, the top of the footing or foundation stem wall on which wall studs or posts are supported is:			
a. sloped parallel to the ground slope	[3.7]		
b. stepped	[1.8]		
c. at a constant elevation with no steps	[0.6]		
d. not applicable	[0]		

**B. Superstructure Framing and Configuration** (Every accessible area such as the attic and under-floor area that reveals structural elements must be inspected.)

	<u>Penalty</u>		<u>Penalty</u>
B-1 The dwelling has: (circle all that apply, a to e)		*B-4 For an attached garage with a second floor above, the narrow walls at the side of the garage door openings have:	
a. unsymmetrical wall strength (torsion problems)	yes [1.6]	a. wood structural panels on each narrow wall pier	[0]
b. reentrant corners (seen in plan view)	yes [0.3]	b. structural steel frames around or alongside the door	[0]
c. split-level floor construction	yes [2.0]	c. prefabricated narrow shear walls, installed in accordance with manufacturer's recommendations	[0]
d. out-of-plane offsets of more than 4 ft. in exterior walls	yes [0.4]	d. none of the conditions specified in conditions a, b, or c above (that are visible)	[3.0]
e. non-orthogonal seismic resisting systems	yes [0.6]	e. not applicable (single story) or built in accordance with 1997 UBC, 2000 IBC, 2000 IRC or later edition	[0]
f. none of the above, or built in accordance with 1994 UBC, 2000 IBC, 2000 IRC or later edition	yes [0]		
*B-2 For exterior walls at the lowest occupied story, the summed length of full story height wall sections (between openings, excluding < 2'-8" panels) on any face is less than:		*B-5 The exterior wall covering is primarily:	
a. 20% of the length of the wall, if a single story	yes [3.2]	a. siding known to be over plywood or OSB sheathing	[0]
b. 25% of the length of the wall, if two stories	yes [3.2]	b. siding not known to be over plywood or OSB sheathing	[2.5]
c. 40% of the length of the wall, if three stories or more	yes [3.2]	c. plywood (T1-11) or diagonal wood siding	[0]
d. none of the above	[0]	d. stucco	[1.0]
*B-3 If the roofing is heavy (i.e., clay or concrete tile) the dwelling is:		e. masonry veneer not more than 10 feet above the supporting foundation	[2.5]
a. single story	[1.6]	f. masonry veneer more than 10 feet above the supporting foundation	[3.5]
b. multi-story	[3.5]		
c. not applicable: roofing is light.	[0]		

\*Assessment item that may be improved by seismic retrofit; see page 6, Section H

**B. Superstructure Framing and Configuration** (Every accessible area such as the attic and under-floor area that reveals structural elements must be inspected.) (continued)

<u>Penalty</u>	<u>Penalty</u>
B-6 There is evidence of interior remodeling that has removed interior walls: yes [1.0] no/ not applicable [0]	c. original or retrofitted perimeter cripple walls with plywood or OSB sheathing where cripple walls are one story or less in height [1.0]
B-7 The number of stories is: a. one (1) [0] b. two (2) [1.8] c. 3 or more [3.6]	d. original or retrofitted perimeter cripple walls with plywood or OSB sheathing where cripple walls are greater than one story in height [4.0]
*B-8 At the dwelling perimeter, the main lowest framed floor is supported on: a. beam and column (post-and-pier) system with no sheathed exterior walls [14.0] b. perimeter cripple walls with no plywood or OSB sheathing [14.0]	e. wood or steel diagonal braces not detailed in accordance with 1997 UBC, 2000 IBC or later edition [7.0] f. plywood or OSB sheathed perimeter skirt walls that do not extend to and anchor to the foundation [7.0] g. none of the above [0]
	<b>Total</b> <input type="text"/>

**C. General Condition Assessment**

<u>Penalty</u>	<u>Penalty</u>
C-1 The overall condition of the dwelling is: a. good (essentially crack free, no moisture/water intrusion problems) [0] b. fair (minor wood decay and cracks) [1.0] c. poor (many cracks on interior and exterior, floor out-of-level and wood decay) [2.1]	*C-4 At the foundation level, there is: a. significant deterioration visible (corrosion, material breakdown) [1.3] b. some deterioration visible [0.6] c. no deterioration visible [0]
*C-2 In the under floor area, there has been structural alteration (e.g. cutting or notching of framing for electrical, plumbing, mechanical equipment) that would affect the performance of the dwelling in an earthquake: yes [1.5] no [0] not applicable [0]	C-5 Throughout the dwelling, the quality of construction appears to be: a. good [0] b. average [0.8] c. poor [1.7]
*C-3: There is evidence of: stucco detachment, bowing of stucco, corroded wire mesh, extensive cracking at finished grade above the bottom of the stucco: a. extensive [2.0] b. minor [1.0] c. none [0]	
	<b>Total</b> <input type="text"/>

**D. Nonstructural Elements, Age, and Size**

<u>Penalty</u>	<u>Penalty</u>
*D-1 The chimney inspection revealed: a. properly connected anchor straps tying the masonry/concrete chimney(s) at side of house to the floor, ceiling and roof framing yes [1.0] no [2.0] b. chimney occurs at dwelling interior [1.0] c. dwelling has no masonry/concrete chimney [0]	*D-4 The dwelling has exterior stairs, decks or porch roofs, without internal earthquake bracing, that are attached to the dwelling with: a. two or more connections tying the stair, deck or porch to the dwelling interior framing [0] b. nails or screws that would be loaded in withdrawal if the stair deck or porch moved away from the dwelling [1.0] c. other connection configurations [1.0]
*D-2 The gas water heater has effective anchor straps and water and gas connections: yes [0] no [1.0]  The electric water heater has approved anchor straps: yes [0] no [0.7]	D-5 The dwelling was built: (if remodel/added area >50% of total area, use addition date): a. before 1920 [3.0] b. 1921 to 1977 [2.0] c. 1978 to 1993 [1.0] d. 1994 or later [0]
*D-3 An earthquake-activated gas shut-off valve is installed: yes [0] no [1.0] not applicable [0]	D-6 The approximate total floor area (sq. ft.) of the dwelling and attached garage is: a. < 1600. [0] b. 1601 - 2500 [1.0] c. ≥ 2501 [2.0]
	<b>Total</b> <input type="text"/>

\*Assessment item that may be improved by seismic retrofit; see page 6, Section H



**Table 2. Assignment of Site as Being Within a Liquefaction Zone**

1. If site is in California, locate site on the California Emergency Management Agency (Cal EMA) MyPlan web site ([myplan.calema.ca.gov](http://myplan.calema.ca.gov)).
  - a. Enter address in 'Find Location' window.
  - b. Select 'liquefaction' in menu bar to right of map.
  - c. Zoom as needed to see map details.
  - d. If site is located within green zone on map, answer to Question F-3 is 'yes'.
  - e. If site located in non-liquefaction and non-seismic landslide zone on map (generally pale yellow), answer to Question F-3 is 'no'.
  - f. Site not mapped if background is stippled. Go to Step (2).
2. If site is not on Cal EMA web site, determine site liquefaction potential/susceptibility using available web resources. See [www.ATCouncil.org/pdfs/FEMAP-50LiquefactionInfo.pdf](http://www.ATCouncil.org/pdfs/FEMAP-50LiquefactionInfo.pdf) for a list of such resources. Map types shown in these web resources are:
  - a. Liquefaction susceptibility maps. Answer to F-3 is 'yes' if site is in a zone of moderate-to-high liquefaction susceptibility. Answer is 'no' if in a low susceptibility or non-susceptible zone.
  - b. Liquefaction potential maps. Answer to F-3 is 'yes' if site is in a liquefaction potential zone. Answer is 'no' if in a low or null potential zone.
  - c. Liquefaction potential index (LPI) maps. Answer to F-3 is 'yes' if site is has mapped  $LPI \geq 5$  and no if mapped  $LPI < 5$ .
3. If the location of the site has not been mapped, Question F-3 can be answered as 'yes' if other local information suggests liquefaction potential and 'no' if such information suggests no such hazards.
4. If no maps are available and no information on site conditions is available, answer question F-2 as 'no'.

**Table 3. Assignment of Site as Being Within a Seismic Landslide Zone**

1. If site is in California, attempt to locate site on the Cal EMA MyPlanweb site ([myplan.calema.ca.gov](http://myplan.calema.ca.gov)).
  - a. Enter address in 'Find Location' window.
  - b. Select 'landslide' in menu bar to right of map.
  - c. Zoom as needed to see map details.
  - d. If site is located within brown zone on map, answer to Question F-3 is 'yes'.
  - e. If site located in non-seismic landslide zone on map (generally pale yellow), answer to Question F-3 is 'no'.
  - f. Site not mapped if background is stippled. Go to Step (2).
2. If site is not on Cal EMA web site, determine site landslide potential/susceptibility using available web resources. See [www.ATCouncil.org/pdf/FEMAP-50LandslideInfo.pdf](http://www.ATCouncil.org/pdf/FEMAP-50LandslideInfo.pdf) for a list of such resources. Map types shown in these web resources are:
  - a. Seismic landslide susceptibility maps. Answer to F-3 is 'yes' if site is in a zone of moderate to high seismic landslide susceptibility. Answer is 'no' if in a low susceptibility or non-susceptible zone.
  - b. Seismic landslide potential maps. Answer to F-3 is 'yes' if site is in a seismic landslide potential zone. Answer is 'no' if in a low or null potential zone.
3. If the location of the site has not been mapped, Question F-3 can be answered as 'yes' if other local information suggests high landslide potential and 'no' if such information suggests no such hazards (e.g., flat site).
4. If no maps are available and no information on site conditions is available, answer question F-2 as 'No'.

**Table 4. Assignment of Site as Being Within a Surface Fault Rupture Zone**

1. If site is in California, locate site on the Cal EMA MyPlanweb site ([myplan.calema.ca.gov](http://myplan.calema.ca.gov)).
  - a. Enter address in 'Find Location' window.
  - b. Select 'Fault Lines' in menu bar to right of map.
  - c. Zoom as needed to see map details.
  - d. If site is located within gray zone on map, answer to Question F-5 is 'yes'.
  - e. If site located in non-gray zone, answer to Question F-5 is 'no'.
  - f. Site not mapped if background is stippled. Go to Step (2).
2. If site is not on Cal EMA web site, locate site using USGS Quaternary faults web site (<http://geohazards.usgs.gov/qfaults/map.php>).
  - a. Select applicable state or region.
  - b. Zoom in on site and determine whether site is near a Quaternary fault that has been active within 15,000 years (marked as red or yellow on map).
  - c. Faults are only marked for map scales marked at the 1 km (or larger) level. At this level of zoom, Question F-5 can be answered as 'yes' if the mapped fault trace is within approximately 0.25 km of the site and 'no' otherwise.

**Table 5. Seismic Performance Grade Based on Structural Score and Regional Seismic Hazard Score**

Seismic Hazard Score		0 - 1	2 - 3	4 - 5	6 - 7	8 - 10	11 - 12
<b>Structural Score</b>	1.0 - 45.9	B-	C+	C	D	D-	D-
	46.0 - 64.9	B+	B	C+	D+	D	D-
	65.0 - 74.9	A-	B+	B	C	C-	D+
	75.0 - 84.9	A-	A-	B+	B-	C	C
	85.0 - 100	A	A	A-	B+	B	B-

**G. Determination of Seismic Performance Grade**

**1. Structural Score**

- |   |           |
|---|-----------|
| a. Foundation (Section A)                               | [       ] |
| b. Superstructure Framing and Configuration (Section B) | [       ] |
| c. General Condition Assessment                         | [       ] |
| d. Nonstructural Elements, Age, and Size (Section D)    | [       ] |
| e. Local Site Conditions (Section E)                    | [       ] |

**Penalty Sum**

Total Penalty Points (a to e):

Structural Score = (100 – Total Penalty points from line above):

**2. Seismic Hazard Score** (from Section F):

**3. Seismic Performance Grade** (from Table 5)  
 Note: insert this grade, including + or -, if applicable in box on page 1

**4. Anticipated Seismic Performance<sup>1</sup>**

Following anticipated seismic events.<sup>2</sup>

**Grade A, A-:** Excellent Performer  
 (Potential minor structural and finish damage, earthquake damage ratio<sup>3</sup> of 0%-10%, continued occupancy is likely)

**Grade B, B+, B-:** Good Performer  
 (Potential moderate structural and finish damage, continued occupancy likely following minor structural repairs, earthquake damage ratio<sup>3</sup> of 0%-50%, seismic retrofit measures are encouraged)

**Grade C, C+, C-:** Fair Performer  
 (Potential moderate to major structural and finish damage, structural repairs may be required prior to continued occupancy, earthquake damage ratio<sup>3</sup> of 10%-60%, seismic retrofit measures are strongly encouraged)

**Grade D, D+, D-:** Poor Performer  
 (Potential severe structure and finish damage requiring significant repairs prior to re-occupancy, earthquake damage ratio<sup>3</sup> of 20% – 100%, significant seismic retrofit measures are strongly encouraged)

**Notes:**

- Dwellings are generally anticipated but not certain to have the described performance. The occupancy levels described in this table are generally consistent with the damage levels presented.
- The anticipated seismic events are similar to those used to develop the earthquake ground-motion contours illustrated in the *International Residential Code* Seismic Design Category maps in Figures 2-1 to 2-4.
- Reported earthquake damage ratios are expressed as a percentage of the replacement cost of the dwelling. The damage ratio ranges were obtained from a stochastic computer model of dwellings adjusted to suit the stated structural scores and subjected to a wide range of simulated ground motions. The damage ratios were chosen to have a 1/500 likelihood of being exceeded in any given year for the stated range of seismic hazard score. The stochastic analysis is discussed in detail in Appendix D.

## H. Improving the Seismic Performance Grade

The Structural Score and Seismic Performance Grade may be altered as a result of seismic retrofit or by a more in-depth seismic evaluation of the dwelling and the site by a qualified licensed design professional. Guidance on these issues is provided in Chapter 8.

If seismic retrofit is being considered, the Structural Score could be increased (and the Seismic Performance Grade potentially increased) by retrofitting conditions that would allow the elimination or reduction in penalties, if any, for the following items:

Item	Retrofit Description	Points (circle applicable number)	Priority Retrofit
A-1	Provide continuous reinforced concrete foundation	4.2	
A-3	Provide foundation pads under interior posts	1.4	Yes
A-5	Add anchor bolts or retrofit anchors	1.7 4.6 10.0 15.0	Yes
B-2	Add bracing walls at dwelling exterior	3.2	
B-3	Install lighter roofing	1.6 3.5	
B-4	Install plywood/OSB or steel frame at garage front	3.0	Yes
B-5	Change exterior wall finish	1.0 2.5 3.5	
B-8	Improve bracing at perimeter walls below lowest floor	4.0 7.0 14.0	Yes
C-2	Repair cut structural framing	1.5	
C-3	Repair deteriorated stucco	1.0 2.0	
C-4	Repair deteriorated foundation	0.6 1.3	
D-1	Strap exterior chimney to roof and floors	1.0	
D-2	Provide bracing and flexible water and gas connections for water heater	1.0	Yes
D-3	Provide earthquake-activated gas shut-off valves	1.0	Yes
D-4	Anchor exterior stairs, deck and porch roof	1.0	Yes
E-3	Repair footing cracks	1.0 2.7	
E-6	Improve rain water routing away from foundations	1.3 2.6	Yes

**Priority Retrofits:** For this dwelling, the Structural Score can be increased by as many as \_\_\_\_\_ "Priority Retrofit" points (insert sum of points for circled items in rows with "Yes" in Priority Retrofit column). This will increase Structural Score to \_\_\_\_\_ (Section G, Item 1f Structural Score plus "Priority" retrofit points). This will result in an improved Structural Grade of \_\_\_\_\_ (from Table 5, using improved Structural Score).

**All Retrofits:** For this dwelling, the Structural Score can be increased by as many as \_\_\_\_\_ retrofit points (insert sum of ALL points for circled items). This will increase the Structural Score to \_\_\_\_\_ (Section G, Item 1f structural score plus ALL points circled above). This will result in an improved Structural Grade of \_\_\_\_\_ (from Table 5, using improved Structural Score).

### DISCLAIMER

THE APPLIED TECHNOLOGY COUNCIL AND FEMA MAKE NO WARRANTY, EXPRESSED OR IMPLIED, AS TO THE ABILITY OF THE INSPECTED PROPERTY TO WITHSTAND EARTHQUAKES OR OTHER SEISMIC ACTIVITY, NOR AS TO THE COMPLETENESS OF THE FORM OR ITS ACCURACY, IN THAT MANY ASPECTS OF EARTHQUAKE ENGINEERING ARE UNCERTAIN. THE PURPOSE AND VOLUNTARY USE OF THIS FORM IS TO ASSESS WOOD-FRAME DWELLINGS FOR POTENTIAL DAMAGE IN FUTURE EARTHQUAKES. THE FINDINGS AND EXPLANATIONS ARE LIMITED TO SEISMIC VULNERABILITY OF A RELATIVE NATURE AND ARE NOT EXACT. THEY DEPEND ON THE DWELLING'S REGIONAL LOCATION AND A VISUAL INSPECTION OF THE DWELLING FROM ACCESSIBLE LOCATIONS, WITH NO EXPOSURE OF CONCEALED CONDITIONS, NO REVIEW OF CONSTRUCTION DOCUMENTS, NO MATERIALS TESTING, NO STRUCTURAL ANALYSIS AND NO SUBSURFACE INVESTIGATION.

WITH REGARD TO INFORMATION CONTAINED IN CAL EMA'S MYPLAN WEBSITE, THE STATE OF CALIFORNIA AND THE DEPARTMENT OF CONSERVATION MAKE NO REPRESENTATIONS OR WARRANTIES REGARDING THE ACCURACY OF LIQUEFACTION ZONES, LANDSLIDE ZONES, EARTHQUAKE FAULT ZONES OR FAULT TRACES, OR THE DATA FROM WHICH THESE ZONES AND FAULT TRACES WERE DERIVED. NEITHER THE STATE NOR THE DEPARTMENT SHALL BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WITH RESPECT TO ANY CLAIM BY ANY USER OR ANY THIRD PARTY ON ACCOUNT OF OR ARISING FROM THE USE OF THIS INFORMATION.

WITH REGARD TO THE INFORMATION CONTAINED IN THE U.S. GEOLOGICAL SURVEY WEBSITE, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE REGARDING THE ACCURACY OF THE DATA CONTAINED THEREIN. THE TOOL IS NOT A SUBSTITUTE FOR TECHNICAL SUBJECT-MATTER KNOWLEDGE.