UNDERSTANDING BRACE AND BOLT AND OTHER EARTHQUAKE STUFF

An El Cerrito Home Owner’s Workshop Series by Jay Marlette
What’s the concern?
Earthquakes v. Structures
Construction
101
What is Plan Set A?
Fifth Topic

Brace and Bolt Program
Sixth Topic

Disaster Preparedness
Why we are concerned?
Why are we concerned?

The likelihood of an earthquake increased to 70%
Why are we concerned?

Shaking Hazard Map

Source: USGS 2013
Why are we concerned?
Earthquake v. Structures

Sliding or Transition

Overturning
Earthquake v. Structures

Most Damage Below
Earthquake v. Structures
Earthquake v. Structures
Construction 101

The Cripple Wall
Construction 101

The concrete foundation
Construction 101

Mudsill, Plates, and Nuts… Oh my!!!!
Construction 101

Cripple wall
Construction 101

Unbraced

Cripple Wall
Construction 101
Construction 101

Let’s brace this bad boy!!!!
Construction 101

- Something to connect the floor joist to the cripple wall.
- Something to secure the mudsill to the foundation.
- Something to brace the cripple wall.
Construction 101

Four ways to connect the mudsill
Construction 101

Epoxy bolt embedment

Wedge Bolt

Titen Bolt
Construction 101
Construction 101

Vent openings to prevent incidental water intrusion from being trapped in the wall

Blocks are nailed into the mudsill in between the studs to provide a place to nail along the bottom of the plywood.

Plywood and nails brace the cripple wall
Construction 101
Construction 101

Cripple Wall Bracing
- H10 Connectors and / or
- L70 / L90 Clips

5/8" structural grade S-1 plywood shearwall

Holdowns

5/8" Galvanized Foundation Bolts (Expansion or Epoxy Set)

Mudsill Blocking

3" Square Galvanized Plate Washer

Foundation Bolting
Plan Set A
GENERAL INSTRUCTIONS

READ FIRST:
To determine if your home qualifies please answer the following questions. If you answer yes to all of the following questions your home qualifies to use this standard. IF YOU ANSWER YES TO EACH OF THESE QUESTIONS, PROCEED TO APPLICANT INSTRUCTIONS.

DOES THIS PLAN SET APPLY TO YOUR HOME? YES NO
1. Is your home a one or two family residential structure? □ □
2. Is your home two stories or less? □ □
3. Is your home wood-framed construction? □ □
4. Does the building have a continuous perimeter concrete foundation (ignoring the immediate area surrounding the fireplace? porches?) □ □
5. Does your house have a crawl space? □ □
6. Are all the cripple walls less than 4 feet in height? (See detail 2/S1 in lower left corner of plan set for an example of a cripple wall) □ □
7. If your home has brick or stone veneer along the exterior walls (excluding any chimneys), is the maximum height of the veneer 4 feet above the foundation? (If your home does not have any brick or stone veneer, you should answer this question as a YES.) □ □
8. If the roofing of your home is clay tile, are the tiles installed without the use of mortar along the tile edges. (If your home’s roofing is a material other than clay tile you should answer this question as a YES.) □ □

IF YOU ANSWER NO TO ANY OF THESE QUESTIONS CONTACT YOUR LOCAL BUILDING DEPARTMENT FOR ASSISTANCE.
**Plan Set A**

### Reinforcement Schedule

<table>
<thead>
<tr>
<th>Total Floor Area (sq ft)</th>
<th>Heavy or Light Construction</th>
<th>Plywood Reading</th>
<th>Wall Anchorages</th>
<th>Floor to Ceiling Wall/Interwall Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>Heavy</td>
<td>12&quot;</td>
<td>5</td>
<td>11</td>
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<tr>
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<td>18&quot;</td>
<td>5</td>
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</tbody>
</table>

#### Definitions

**Light** and **Heavy** construction refer to the load-bearing capacity of the building. Light construction is typically used for residential structures, while heavy construction is used for commercial or industrial buildings.

#### Footnotes

1. **Connector Capacity (Pounds) and Connection Description**
   - 400 lbs: T70 x 16 gage x 2" long
     - H10 anchor
   - 600 lbs: T90 x 16 gage x 2" long
     - H10 anchor
   - 800 lbs: 1/2" dia. bolt
   - 1170 lbs: 5/8" dia. bolt
   - 1340 lbs: UFP-10 Universal plate anchor

**NOTE:**
- Clay tile weighing more than 11 pounds per square foot may be considered on an individual basis.
- Check with your local building department for approval.
Plan Set A
Brace and Bolt

WELCOME TO EBB.
Program Registration will be open January 23 through February 23, 2018. We provide grants to help homeowners seismically retrofit their older home.

www.earthquakebracebolt.com
Disaster Preparedness

SF72 is San Francisco’s hub for emergency preparedness.

What is SF72?
SF72 is your hub for emergency preparedness. You’ll find information about what to do in an

Why 72?
In a serious emergency, city services will be impacted, so a basic rule of thumb is for people

www.sf72.org
Disaster Preparedness

[Image]

www.el-cerrito.org/fire/cert or fire@ci.el-cerrito.ca.us