CALBO Annual Business Meeting
The Building Official and the CEA

Janiele Maffei, S.E.
Chief Mitigation Officer

CEA Established Following Northridge Earthquake

January 17, 1994
Northridge Earthquake

- $20 Billion residential damage
- Insurance companies stopped writing homeowners

1996: CEA Created

Publicly Managed
Governing Board

Governor
Insurance Commissioner
State Treasurer
Assembly Speaker
Senate Rules Chair

Privately Financed
Participating Insurers

Public Mission
Not-for-Profit

CEA Policyholders

2017: 900,000 +

STRATEGIC PLAN
Educate
Mitigate
Insure
CEA Mitigation Activities

- **Research**
  - Post-EQ inspections
  - Building performance
- **Guideline (Code) Development**
  - More plan sets
- **Seismic Assessment Tools**
  - QuakeGrade™
- **Incentive Programs**
  - EBB

2017 Participating Insurers
Future Retrofit Standards

• ATC 110 Pre-standard
• Jointly managed by FEMA and the CEA
• Intended to be a model code
• 2018 completion

Future Retrofit Standards

• ATC 110 scope:
  – Cripple walls up to 7’
  – Living space over garage (soft-story)
  – Hillside homes
  – Masonry chimneys
Required at Point-of-Sale in California

Homeowner’s Guide to Earthquake Safety:
- Guide to assist homeowners in filling out the Residential Earthquake Hazards Report

Residential Earthquake Hazards Report

Residential Earthquake Hazards Report:
- Sellers must hand buyers a completed disclosure report.
- Report is signed by seller and buyer.
Residential Earthquake Hazards Report

• Is the house outside an “Alquist-Priolo Earthquake Fault Zone” (a zone immediately surrounding a known earthquake fault)?

• Is the house outside a Seismic Hazard Zone (zone identified as susceptible to liquefaction or landslide)?

Existing Tool for Seismic Assessment

• FEMA P-50 Simplified Assessment
• ...and now there is QuakeGrade™

QuakeGrade™ / CREIA Training
• California Real Estate Inspectors Association
  – Soon to have a seismic assessment certification
• In association with FEMA and ATC
Napa Earthquake Survey

Key Findings:
1. 25% of homeowners did not know if their home had been retrofitted
2. Homeowners who had retrofitted their houses were not clear on what that retrofit was intended to accomplish
3. The template for post-earthquake surveys should address the need for un-biased participants.
**EBB Overview**

- Jointly managed by CEA and Cal OES
- Created to offer retrofit incentives
- EBB first to promote code-compliant retrofit
- More than 1 Million cripple wall homes

**EBB Overview**

- 2017 Marks Year Four
- Up to $3,000
- In Accordance with:
  - Appendix Chapter A3 or
  - Plan Set A
- Grown Every Year to More Cities and Zips
- Received $3 Million from the State of California
EBB Overview

- City Selection Process
  - High hazard + high density of older homes
  - Bay Area and Los Angeles Area
    - 2013/14 Pilot: 4 Zip Codes in 2 Cities
    - 2015: 28 ZIP Codes in 6 Cities
    - 2016: 100+ ZIP Codes in 18 Cities
    - 2017: 140+ ZIP Codes in 33 Cities

The Process

- Outreach and 30 Day Registration
- Random selection
- 8 Weeks: contractor and permit
- 6 Months: complete work
The EBB Process

- **Pre-Retrofit Documentation**
  - Permit language reference in scope of work
  - Before photos

- **Retrofit**

- **Post-Retrofit Documentation**
  - After photos
  - Signed building permit
  - Contractor invoice / receipts
  - Payment Authorization From
  - IRS W-9 Form
Building Departments
Earthquake Brace + Bolt program is designed to encourage homeowners to complete a code-compliant seismic retrofit of their older house. Homes included in the program are those that conform to the latest California Existing Building Code, Appendix Chapter A3. Chapter A3 provides detailed descriptions of the building elements that need to exist and the prescriptive plans on completing a retrofit. Homesowners participating in the program are advised they will need to obtain a building permit signed by a building official who has inspected and confirmed the retrofit was done in accordance with Chapter A3. Building officials are requested to ensure the permit’s Scope of Work denotes the work will be performed “in accordance with Appendix Chapter A3 or an approved standard plan set.”

Additional Resources:
- FEMA Education Course on Appendix Chapter A3
- City of Los Angeles Department of Building and Safety Standard Plan Number 1
- Standard Plan developed by the Association of Bay Area Governments
- About Standard Plan Set A: Association of Bay Area Governments, Earthquake and Hazards Program

ANIMATION VIDEO: CODE-COMPLIANT CHAPTER A3 RETROFIT.
Cripple Wall Vulnerability
Common Seismic Vulnerability: Cripple Wall

- In adequate sill plate anchorage to foundation
- Unbraced cripple walls (short, stud walls around crawlspace)
1906 San Francisco EQ

![Image: Getty Images]

1989 Loma Prieta EQ

![Image: SF Chronicle]
1994 Northridge EQ

Photo: FEMA

EarthquakeBraceBolt.com

1994 Northridge EQ

Photo: FEMA

EarthquakeBraceBolt.com
2014 Napa EQ

EarthquakeBraceBolt.com

2014 Napa EQ

EarthquakeBraceBolt.com
2014 Napa EQ

Photo: SF Chronicle

Long Recovery Process

Photo: SF Chronicle
2014 Napa EQ

Disproportionately affects economically challenged
Seismic Retrofit Works

Code-Compliant Retrofit

- Provides homeowners and contractors with guidance
- Promotes a complete retrofit
Code Requirements = EBB Requirements

- Code = CBC Appendix Chapter A3
- Engineered retrofit allowed by A3 for
  - Cripple walls > 4'-0” tall
  - Walls with many/large openings
- Construction Documents = Plan Set A, LA Standard Plan Set or Custom Plans

Chapter A3

Chapter A3 Prescriptive House

Chapter A3 Engineered House
## A3 Retrofit Requirements

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<thead>
<tr>
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<td>Maximum Stories</td>
<td>Three</td>
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## A3 - Plan Set Comparison

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<tr>
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<th>Chapter A3</th>
<th>Plan Set A</th>
<th>LA Standard Plan</th>
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Retrofit Plan Required

LABD Sample Plan
LA Standard Plan

Plan Set A
Prescriptive Details

Concept:
- Install anchor bolts if space permits
- If not, install proprietary or engineered anchors
Dwelling Anchorage to Foundation

Concept:
- Is also applicable to basement and retaining walls
- Contact building department for additional retaining wall concerns

New Anchor Bolts

EarthquakeBraceBolt.com
Foundation Plates – Bolt Only

EarthquakeBraceBolt.com

After

Foundation Plates – Bolt Only

EarthquakeBraceBolt.com
Cripple Wall Bracing

Concept:
• Install sheathing on inside face of cripple wall to resist load direction F1
• Anchor top plate to floor framing above (load in)

New Plywood Sheathing
Vent Holes in Each Stud Bay

Properly Placed Nails
Connect Wall to Floor

Framing Clips

Framing Clip Detail
Replace Decayed Framing

Add Replacement Bolts
Chapter A3 Allows New Footing

New foundation may be designed per Figure A3-1 or A3-2, or be designed by an architect or engineer.

A local building official may require a soils report.

LABD Std. Plan Set Allows New Ftg.
The legacy of the “Voluntary Retrofit”

- Northern California (ABAG 1999) study showed the majority of seismic retrofits done improperly
- Voluntary retrofits often leave out important items

Not Seismic Retrofit
Not Seismic Retrofit

Code Compliant Retrofit

• Does not bring the entire “house” up to code
• Rather, it provides a complete retrofit in accordance with an approved standard
Seismic Retrofit

Before

EarthquakeBraceBolt.com

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Seismic Retrofit

After

EarthquakeBraceBolt.com

72
Seismic Retrofit

Before

Seismic Retrofit

After
Contacts

• **Mark Grissom**
  – Customer Service Manager
  – mgrissom@calquake.com
  – 916.661.5520

• **Sheri Aguirre**
  – Managing Director
  – saquirre@calquake.com
  – 916.661.5574