7K+ RETROFITS
MINIMIZING EARTHQUAKE DAMAGE
ONE AT A TIME
EarthquakeBraceBolt.com
EarthquakeBraceBolt.com
Currently addressing one, particular seismic vulnerability – Inadequate sill anchorage and/or cripple wall bracing
Currently addressing one, particular seismic vulnerability

Crawlspace wall before

Plywood bracing

Anchor bolt
For Homeowners to qualify:

- Owner occupied
- Available to all Californians

For Houses to qualify:

- ZIP Code
- Houses constructed pre-1980
- Raised continuous perimeter concrete foundation
- Sit on level ground or a low-slope site
- Have wood-framed walls (cripple walls) in the crawl space

Reimburse up to $3,000
EBB PROGRAM DEVELOPMENT/COMPONENTS

GOVERNANCE: CEBC Chapter A3 or approved prescriptive plan sets
EBB Service Touch Points

- Marketing & Homeowner Selection
- Register for Program
- Get bids/Select Contractor
- Obtain Permit
- Construction
- Pay
COMMUNITY AND STAKEHOLDER COLLABORATION (ECOSYSTEM):

EBBTools.com
COMMUNITY OUTREACH AND MARKETING

- Media
- Direct mail
- Community email lists
- Local government/organizations
“EBB is an excellent program! Super easy for homeowners! Thanks, EBB. My home is much safer now!”

“The EBB program was pretty simple, and it was pretty clear what the requirements were.”

“With a rating of 1 to 10, the EBB program would be a 10!”
Future Incentive Programs:

**Vulnerable Communities: single-family residences**

- Living space over garage (soft-story)

**Vulnerable Communities: Multifamily residences**

- Damaged multifamily residence due to earthquake
Future Incentive Programs: Soft-Story Houses

Earthquake Soft-Story – ESS Pilot

- Retrofit single-family living space over garage houses (soft-story)
- Require compliance with FEMA P-1100
- Grant amount tbd
Earthquake Vulnerable Communities – EVC Pilot

- Retrofit single-family houses (owned or rented)
- Require compliance with CEBC
- Significant customer service support
  - Assistance in program progression
  - Start-to-finish program assistance
- Grant amount tbd
EVC Service Delivery—Partial to Complete Assistance
Total Cost Delivery System

- Marketing and Homeowner Selection
- Design Retrofit/Obtain Permit
- Get bids/Select Contractor
- Construction
- Inspection & Approval
- CEA Pay
Building Inventories and Assessments

QuakeGrade™

Simplified Seismic Assessment of Detached, Single-Family, Wood-Frame Dwellings
FEMA P-50 / March 2012

Single-story seismic assessment tool
Multifamily Retrofit

Multifamily Housing

Retrofits

- Apartments/Condo buildings
- Some level of assistance with process
- Engineered- design required
- Stacked Financing
- Grant amount tbd

Northridge earthquake damage /AP photo
Multifamily Retrofit

Multifamily Housing Retrofits
  - Approximately $6,000 - $7,000 per unit
  - City must adopt code provisions for retrofit design
  - 8 CA cities have mandatory ordinances
Multifamily Retrofit

Typical Multi-Family Soft-Story Building
Soft-Story Retrofit Plan
Future Incentive Programs: Multifamily housing

**Soft-Story Retrofit Elevation**

- (E) FLOOR FRAMING BEYOND
- REPLACE CONCRETE SLAB ON GRADE AS REQUIRED, TYP.
- (E) 3” DIAMETER PIPE COLUMN AT FLOOR BEAMS, TYPICAL
- (E) CONCRETE FOOTING, TYPICAL
- (E) STEEL BEAM IN FRONT OF EXISTING BEAM
- (N) STEEL COLUMN BETWEEN PARKING SPACES
- (N) CONCRETE FOOTING NEW MOMENT FRAME
- (E) GARAGE DOOR, TYP. FOR THREE EACH BAY

**Area 2 - Column Line B (Looking South)**

Janiele Maffei S.E.
Multifamily Retrofit

Soft-Story Retrofit Elevation

Janiele Maffei S.E.
Multifamily Retrofit

Soft-Story Retrofit Examples
Service Delivery for Multifamily Housing

Partial Cost – Partial Delivery System
Building Inventories and Assessments

Cities with mandatory ordinances:

- Fremont
- San Francisco
- Alameda
- Berkeley
- Oakland
- Los Angeles
- Santa Monica
- West Hollywood
Service Delivery for Multifamily Housing
Partial Cost – Partial Delivery System

Your Organization

Select Building Owner
Design Retrofit/Obtain Permit
Get bids/Select Contractor
Construction
Inspection & Approval
Building Owner/CEA Pay