

Oakland's "Soft Story" Retrofit Program

Background and goals

DAVID BONOWITZ, S.E.

Stakeholder Workshop
July 17, 2019
Oakland City Hall

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Outline

- "Soft story" buildings
- The Oakland program
- Cost-effective retrofit
- Reminders for engineers (and owners)

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“Soft story” buildings



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“Soft story” buildings



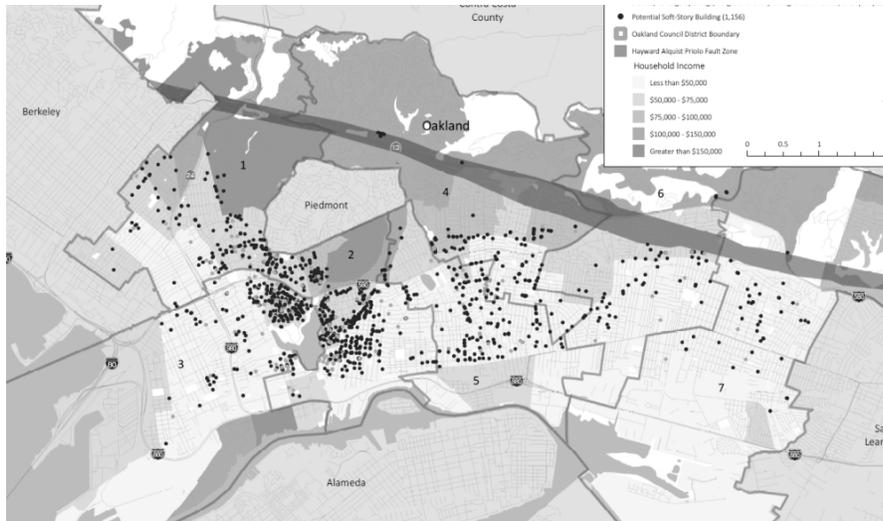
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Fire and neighborhood recovery



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“Soft story” retrofit programs



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Oakland's "subject buildings"

- Pre-1991
- 5 or more dwelling units
- "Wood frame target story"
 - A lower story with vulnerable wall configuration
 - Ground story, partial basement, or crawl space
 - Earthquake resistance comes from wood walls
- For details, see OMC 15.27.030, 15.27.150

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Oakland's "subject buildings"

- Does *NOT* have to be ...
 - 3 stories
 - "Open" front
 - Full story
 - All parking

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5 Steps

1. Petition for Exemption (optional)
2. Petition for Change of Compliance Tier (optional)
3. Mandatory nonstructural evaluation
 - See Technical Bulletin 15.27-2
4. Retrofit design and permit application
 - Alternative: Comply by evaluation
 - See Technical Bulletin 15.27-1
5. Construction and close-out

- For details, see FAQ, Bulletin 15.27-1

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Cost-effective retrofit

- Address only the worst deficiency
 - Target story only
 - Structural only
- Use reduced loads
- Use a specialized code
 - CEBC Chapter A4 with modifications
- A ready Bay Area market

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Typical retrofit

- Add wood sheathing to existing stud walls



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Typical retrofit

- Add "load path" elements



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Typical retrofit

- Add steel frame or column at open front



Degenkolb Engineers



Thor Matteson, S.E.

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Reminders for Engineers

- 2-story buildings are Included
- CMU partitions

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Reminders for Engineers

- Step 3: Mandatory nonstructural evaluation
 - No submittal required
 - Owner affidavit only
 - ASCE 41-17
 - LS w/ BSE-1E hazard
 - Limited scope
 - Gas lines
 - URM partitions
 - Masonry veneer
 - Chimneys
 - Other falling hazards

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Reminders for Engineers

- Step 3: Mandatory nonstructural evaluation
 - Bulletin 15.27-2
 - Custom ASCE 41 checklist
 - C – NC – NA – U options
 - Report template
 - “Written seismic evaluation”
 - “Schematic retrofit report”
 - Owner affidavit separate



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Technical Bulletin (TB) 15.27-2
Evaluation and Schematic Retrofit Report Template
for Compliance with
Oakland Municipal Code Chapter 15.17

Purpose: This checklist and report template is provided for the convenience of owners and design professionals seeking to comply with OMC Chapter 15.17. Its use is not required. Where used, the design professional may remove or replace the header and introductory material and should add material identifying the subject building, the nature of the evaluation, etc.

Scope: OMC Section 15.17.050.C requires a written seismic evaluation and schematic retrofit report. Section 15.17.165 sets the evaluation criteria. Part B of TB 15.27-2 establishes the required minimum scope of the evaluation and schematic retrofit report. As noted in TB 15.27-2, the completed evaluation and schematic retrofit report need not be submitted to the Bureau of Building. Separate from the evaluation and schematic retrofit report to be produced by the design professional, OMC Section 15.17.050.F requires the Owner to submit an affidavit of compliance with these minimum requirements.

Seismic Evaluation and Schematic Retrofit Report
Prepared for compliance with OMC Section 15.17.050.C in accordance with TB 15.27-2, Part B
The following material is excerpted from ASCE 41-17 Table 15.5B for a performance objective of Nonstructural Life Safety with the BSE-1E hazard

C	NC	NA	U	SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks.
None:				
Retrofit:				
C	NC	NA	U	FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings.
None:				
Retrofit:				
C	NC	NA	U	UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 6 ft.
None:				
Retrofit:				
Masonry Veneer				
Condition: See ASCE 41-17 Section 4.2.1.				
C	NC	NA	U	THIS: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-3 square feet, and the ties have spacing no greater than 24 inches.
None:				
Retrofit:				
C	NC	NA	U	SHIELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.
None:				
Retrofit:				

May 19, 2019

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