The City of Berkeley

Estimating Pre-1980 Concrete Buildings

Hedi Faison
Pacific Earthquake Engineering Research Center
Joan MacQuarrie
City of Berkeley, Building Official
Building and Safety Division
January 28, 2009

Berkeley Statistics

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Population</td>
<td>100,000 people</td>
</tr>
<tr>
<td>City Area</td>
<td>10 sq mi</td>
</tr>
<tr>
<td>Year of incorporation</td>
<td>1878</td>
</tr>
<tr>
<td>Population Density</td>
<td>10,000 people/sq mi</td>
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<tr>
<td>Known Faults within</td>
<td>Hayward Fault</td>
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<tr>
<td>City Limits</td>
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- Interesting facts:
  - UC Berkeley Campus
  - Active Building Dept
  - Highly educated population

Useful Step: History of City

Source: "Berkeley, A City in History" by Charles Wollenberg © 2002

- Building and Population Boom years:
  - Post 1906
    - Population quadrupled within a decade
  - Post 1923 Great Fire
    - Housing, commercial, manufacturing construction booms
  - Post WWII
    - apartment construction for huge influx of UCB students
- Historical Earthquake Damage:
  - 1868 – not much of a city to be damaged
  - 1906 – minor damage
  - 1989 – minor damage

Useful Step: Get GOOD Contacts

- City of Berkeley—Building & Safety Division
  - Current and retired building officials
  - Seismic Safety Coordinator
  - Plan Checkers
  - Building Inspectors
- Alameda County—Assessment Services Div.
- Engineers / Architects
- Professors (Architecture & Engineering)
- City Safety Advocates (leaders of programs)
- Realtors & Developers

Make Contacts at the BUILDING DEPT!!!

Useful Step: Mitigation Programs

- City of Berkeley Building Seismic Mitigation Programs:
  - Public School & Fire Station & City Hall Retrofit Program
    - COMPLETED!
  - URM Inventory and Mandatory Retrofit Ordinance
    - ~ 90% Complete
  - Tilt-up Inventory
  - Soft Story Engineer’s Analysis Required
    (but NO Mandatory Retrofit Ordinance...yet)
  - UC Berkeley Seismic Mitigation Program

PROCESS: Data Mining

- REALQUEST
  - Software extracts data from Tax Assessor’s Data
  - Many city planning departments subscribe to this service!

- Berkeley Approach:
  - RealQuest search with filters:
    - for Building Type = "Concrete" & "Masonry"
    - For Year Building from 1860 – 1979
    - For City of Berkeley
  - Yields list of addresses meeting the filter criteria
  - Subtract known tilt-up and URM buildings
PROCESS: Street Survey
- Survey commercial corridors where concrete buildings are likely
  Method Used: CAR Driving Survey
- GOALS:
  1. Look for missing concrete buildings
  2. Identify buildings on current list that should be removed

PROCESS: Getting the Number
- Take REALQUEST Number: 805
- Remove Condo Duplicates: 727
- Remove Existing Bldg Inventories:
  - URM List: 476
  - Conc Tilt-up List: 452
- Adjust for Accuracy based on Street Survey:
  - only 40% of surveyed bldgs from list are actually concrete
  - $78 \times 0.4 = 180$

FINAL ESTIMATE = 150 – 250 Buildings

PROCESS: Further Refinement
- Additional street surveys of commercial & industrial & student residential corridors
- Contact local experts and get their “endorsement” of the process and final number
  - Engineers
  - Architects
  - Realtors & Developers
  - Building Inspectors
Final Thoughts

• Don’t get frustrated with inaccuracy
• Sidewalk surveys give good reality check
• Good contacts – work with your local government
• Knowing the history of the city is useful
• Expert panel should provide worthwhile feedback

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