Post-earthquake Response and Recovery: 
*ATC-20 and beyond*

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Thursday, March 8
ATC-20 Development History
2010 Eureka, CA Earthquake

Red Tag Due to Damage Over Front Entrance

2 Yellow Tags on Side Entrance Around Corner
2014 Napa, CA Earthquake

- Outdoor seating was restricted, “except during the following times: (1) Monday – Friday, 4:30pm to closing, (2) Saturday to Sunday – All Day.”

- The restrictions should not relate to when the restaurant is open, but rather to the hazard itself.

- Placing exceptions for specific times is inappropriate and potentially endangers patrons.
**Timber Columns** *(not part of roof support system)*

<table>
<thead>
<tr>
<th>Column (kaw) noticeably out-of-plumb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post UNSAFE if out-of-plumb by more than 5 cm.</td>
</tr>
</tbody>
</table>

Use a plumb bob or a stick to measure lean

5 cm or more

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**Rammed Earth Walls**

<table>
<thead>
<tr>
<th>Noticeably out-of-plumb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post UNSAFE if wall is leaning by more than 1/4 of the wall thickness.</td>
</tr>
</tbody>
</table>

Use a plumb bob or stick to measure wall lean

More than $\frac{1}{4}$

Wall thickness, $t$
- Representative samples of building types
- Teams assigned to a specific building checks morning after
- Follow consistent procedures to monitor damage between different visits
- If a certain construction type shows excessive damage => check all nearby buildings of that type
A classification scheme for land instabilities.

A list of data collection topics specific to land instabilities.

Assessment criteria for landslides, boulder roll, cliff collapse, debris flow, lateral spreading, landslide dams, and surface faulting.

Specific geotechnical rapid assessment forms.

A high level of graphical clarity.

Images of safety equipment and useful resources, rather than bullet point list.
Program Management

Define the goals and objectives of the RVS program and how the results will be used

Select the Program Manager and the Supervising Engineer

Define the scope of the program and develop the budget

Perform pre-field planning

Select and modify the Data Collection Form

Select and train the screeners

Acquire and review of pre-field building data

Review existing construction drawings, if available

Perform field screening of buildings

Check the quality of the screening data

File the screening data in the record-keeping system

RVS results available for the RVS Authority to use for decision making

FEMA P-154 (2016)

EERI 2019 ANNUAL MEETING

March 5-8, 2019

Vancouver, BC, Canada
After an earthquake, even housing that is safe enough to occupy will not meet existing codes. A phased standard needs to be defined in this post-earthquake period, where requirements are gradually increased until the housing emergency is over.
Emerging Technologies

Promoting the Use of Mobile Technology for Pre- and Post-Earthquake Safety Evaluation of Buildings
What’s next (in the U.S.)?
Disaster Recovery Reform Act of 2018

One Hundred Fifteenth Congress of the United States of America

AT THE SECOND SESSION
Begun and held at the City of Washington on Wednesday,
the third day of January, two thousand and eighteen.

An Act

(1) IN GENERAL.—The Administrator shall coordinate with State and local governments and organizations representing design professionals, such as architects and engineers, to develop guidance, including best practices, for post-disaster assessment of buildings by licensed architects and engineers to ensure the design professionals properly analyze the structural integrity and livability of buildings and structures.

(2) PUBLICATION.—The Administrator shall publish the guidance required to be developed under paragraph (1) not later than 1 year after the date of enactment of this Act.

(b) National Incident Management System.—The Administrator shall revise or issue guidance as required to the National Incident Management System Resource Management component to ensure the functions of post-disaster building safety assessment, such as those functions performed by design professionals are accurately resource typed within the National Incident Management System.

(c) Effective Date.—This section shall be effective on the date of enactment of this Act.
The Administrator shall coordinate with State and local governments and organizations representing design professionals, such as architects and engineers, to develop guidance, including best practices, for post-disaster assessment of buildings by licensed architects and engineers to ensure the design professionals properly analyze the structural integrity and livability of buildings and structures.
“Disaster” Multihazard

Earthquake
High Winds
Flood/Tsunami
Geotechnical
Volcano
Hail/Snow/Ice
Fire/Explosion
"Disaster" ➔ Multihazard

Earthquake
High Winds
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DRRA Team – Authors and Reviewers

- State and local governments
  - Building officials (2+1), mayor (1), CalOES, BC Housing, HUD,

- Organizations representing design professionals:
  - NCSEA, AIA, ICC

- Design Professionals:
  - Structural engineers (3), architect, environmental health specialist
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Post-Disaster Assessment of Buildings

- Structural Integrity
  - "Safety"
- Implementation
- Livability
  - "Habitability"
Available guidance
Owner’s guide to damage assessment
Emerging technologies
Research and development needs
Habitability

- Shelter-in-place
- Alternative habitability
- Assessment and minimum requirements for:
  - Environmental hazards
  - MEP, safety alarms, exiting, accessibility, security
  - Non-residential buildings
Program Management

○ PRE-disaster
  • Resource typing
  • Certification
  • Planning
  • Mutual aid
  • Volunteers

○ POST-disaster
  • Deployment
  • Data collection
  • Quality assurance
  • Reassessment
  • Cordonning
  • Communication
**Project Overview**

- Literature Review
- Draft and Review*
- Final Guidance (Oct 5, 2019)

*Review by Project Review Panel and online feedback from a broader stakeholder group*
Questions?

2:00pm – 3:30pm
Interactive Workshop 5B
Same Room (Parq B&C)