Technical Session 5A: Post-Earthquake Response and Recovery – BC’s Performance Based Post-Earthquake Assessment of Buildings Project

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Director, Professional Practice, Standards and Development, Engineers and Geoscientists BC

Thursday, March 7
Engineers and Geoscientists BC

- Legislated authority to regulate the practice of professional engineering and professional geoscience

- Primary duty:
  - “to uphold and protect the public interest”

- Primary object:
  - “to establish, maintain and enforce standards for the qualifications and practice of its members and licensees”

- Primary tool for delivery on our object – Professional Practice Guidelines
Engineers and Geoscientists BC and Seismic Mitigation

Performance Based Seismic Assessment and Retrofit Guidelines

- BC School Seismic Mitigation Program
- Seismic Retrofit Guidelines
  - SRG-3
  - Seismic Performance Analyzer
  - Post-earthquake evaluation guidelines
Seismic Retrofit Guidelines

- Unique collaboration between government, local/US engineering communities, academia and the engineering regulator
- Sharing of information, high level of cooperation between consultants (shared database)
- Training of engineering firms
Seismic Retrofit Guidelines

Recognized with a number of awards for their innovation and technical expertise, including:

- **Canadian Society of Civil Engineering** – *Excellence in Innovation in Civil Engineering* (2010)

- **Association of Consulting Engineering Companies BC** – *'Lieutenant Governor’s Award for Engineering Excellence'* and *'Award of Excellence - Soft Engineering'* (2013)

- **Association of Consulting Engineering Companies Canada** – *'Engineering a Better Canada Award'* and *'Award of Excellence – Special Projects'* (2013)

- **Applied Technology Council (ATC) and Structural Engineering Institute (SEI) of the American Society of Civil Engineers** – *'Champions of Earthquake Resilience Award - Extraordinary Innovation in Seismic Protection of Buildings'* (2015)

- Performance based approach adopted by FEMA

- Over 170 schools upgraded to date
Application to Other Existing Building Stock

Emergency Management BC project

- Engineers and Geoscientists BC and UBC Earthquake Engineering Research Facility

- 4 year agreement (in year 2) to develop:
  - Training on performance based approach to post-earthquake assessment of buildings
  - Training to include building officials, building operational staff, engineers, architects, and others
Training Delivery

- Located at UBC’s Earthquake Engineering Research Facility
- Opportunity to apply skills to a live test of a full sized structure
- Participants apply their training in simulated real time and are evaluated

Training completed to date:
- 2 hour classroom training
- UBC dynamic test
- Engineers, school district officials
Technical Session 5A: Post-Earthquake Response and Recovery – Prioritized Post-earthquake Response (PPR)

Graham Taylor, Ph.D., P.Eng.
TBG Seismic Consultants Ltd.
Sidney, BC
Thursday, March 7
Scope of Prioritized Post-earthquake Response (PPR)

- Building Assessment
- Ground Motion Sensors
- On-line Database Tool (Responder)
- Community Empowerment
- Post-event Prioritized Action Reports
Fairview Elementary School – Nanaimo
Sidney Community Safety Building
PPR Building Assessment

- Simplified IDA Analysis of Building
- Calculation of PPR Thresholds (PPR Green / Yellow / Red)
- PPR Green – Moderate Damage, Safe in Aftershocks
- PPR Yellow – Extensive Damage, Potentially Unsafe
- PPR Red – Total Damage, Unsafe
PPR Rating of Building

PPR Rating for Single Family House
PPR Ground Motion Sensors
PPR Responder (On-line Database Tool)
PPR Community Empowerment
PPR Post-event Prioritized Reports

<table>
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<tr>
<th>Priority One</th>
<th>Priority Two</th>
<th>Priority Three</th>
<th>Total</th>
<th>Percent Community</th>
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<tbody>
<tr>
<td>Number of Units</td>
<td>92</td>
<td>770</td>
<td>54</td>
<td>916</td>
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<td>Number of Residents</td>
<td>152</td>
<td>1280</td>
<td>88</td>
<td>1520</td>
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Search and Rescue Results

50%
SuperResiliency

- New Paradigm – Equal Emphasis on Post-event Response
- Prioritization
- Empowerment – Decision to Stay / Leave
Thank you!