Evaluation of Buildings and Retaining Walls for Pre-Earthquake Investigations
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Current Situation:
- Rush to collect data after and earthquake
- Lack of synchronization, collaboration, and cohesion in efforts
- Need for streamlined procedure and central database
- Need for pre-earthquake references of structures of performance analyses
- Lack of understanding of effects of seismic earth pressures on retaining walls

Purpose:
- To assess current earthquake data storage system
- To develop evaluation criteria and procedure for pre-earthquake investigations of buildings and retaining walls
- To conduct pre-earthquake investigations for reference for future seismic performance analyses

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Acknowledgements

References

Conclusions

Results/Current State of SPO
- Completed pre-earthquake investigations for various buildings and retaining walls
- Created reference for use in future seismic performance analyses
- Developed usable archive for storage and organization that will help facilitate use of data in future studies
- SPO still in pre-beta form but still usable to those with access to the database
- Plans to further develop SPO to be available for full academic use in progress

Future Work/Potential Use
- Pre-earthquake references can be used to better understand seismic performance of structures in the event of a significant ground motion.
- The effects of seismic earth pressures on subterranean basement walls can be better understood in future studies using the data from the investigations.

Investigations Summary

Investigations Over Summer 2013
1. Great Western Savings
2. Berkeley Parking Structure
3. San Francisco PUC
4. Berkeley City Hall
5. Berkeley Police Department
6. Hearst Mining Building
7. Hayward City Hall

Downtown Los Angeles Courthouse Parking

UCLA Mathematical Sciences Building

Methodology

Preliminary Research

Pre-Earthquake Investigations

Data Entry + SPO Development

• Preliminary Research
  - Literature review of current earthquake databases
  - Identification of structures and retaining walls of interest
  - Gather information on structures for evaluation
  - Location/Coordinates
  - Building Purpose
  - SSO Station Identification
  - Liquefaction Hazard
  - Closest Active Fault
  - Distance to Fault

• Pre-Earthquake Investigations
  - Coordinate and plan visit of structures to conduct pre-earthquake investigations
  - Gather materials and identify areas of interest in structure if possible based on plan drawings
  - Conduct investigation by taking photos to document current condition and existing damage
  - Document observations and annotate plans if necessary

• Data Entry + SPO Development
  - Organize photos, notes, and annotations
  - Enter data into SPO
  - Create structure input
  - Upload photos to specific structure’s page
  - Attach notes to individual images
  - Classify any damage using database’s taxonomy
  - Link any earthquake data to relevant structures in preparation for any post-earthquake investigations

References

- "Data Methodologies and Data Management to Support Seismic Performance Assessments,“ Earthquake Spectra, 2009
- "Earthquake Engineering Research (PEER) Center," Last modified June 27, 2012
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