

COMMITTEE ON CAMPUS PLANNING, BUILDINGS AND GROUNDS

California State University Seismic Safety Program Annual Report

Presentation By

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Summary

This information item presents the CSU Seismic Safety Program Annual Report. This reporting period spans July 2009 to June 2010.

Seismic Policy and History

The CSU initiated the assessment of the seismic hazards posed by CSU buildings as directed by former Governor Deukmejian's executive order and legislative provisions. In 1993, the CSU Board of Trustees adopted the following policy:

It is the policy of the Board of Trustees of the California State University, that to the maximum extent feasible by present earthquake engineering practice, to acquire, build, maintain, and rehabilitate buildings and other facilities that provide an acceptable level of earthquake safety for students, employees, and the public who occupy these buildings and other facilities at all locations where CSU operations and activities occur. The standard for new construction is that it meets the life-safety and seismic hazard objectives of the pertinent provisions of Title 24 of the California Code of Regulations; the standard for existing construction is that it provides reasonable life-safety protection, consistent with that for typical new buildings. The California State University shall cause to be performed independent technical peer reviews of the seismic aspects of all construction projects from their design initiation, including both new construction and remodeling, for conformance to good seismic resistant practices consistent with this policy. The feasibility of all construction projects shall include seismic safety implications and shall be determined by weighing the practicality and cost of protective measures against the severity and probability of injury resulting from seismic occurrences. [Approved by the Board of Trustees of the California State University at its May 19, 1993 meeting (RCPBG 05-93-13)]

Out of this policy the CSU Seismic Review Board (SRB) was established to advise and assist in determining the condition of CSU buildings, and to technically oversee the Trustees' seismic policy. The CSU seeks to identify potential seismic hazards within its existing building stock and

subsequently pursue their mitigation. It is important to note that the CSU takes an active role in this regard, believing it better to identify potential concerns so as to help prioritize future capital program planning efforts. In all cases should an imminent threat be identified immediate action would be taken.

The CSU Seismic Review Board

The SRB is comprised of:

- Charles Thiel Jr., Ph.D., President, Telesis Engineers (Chairman)
- Gregg Brandow, Ph.D., S.E., President, Brandow and Johnston, Adjunct Professor, University of Southern California
- John Egan, G.E., Principle Engineer, AMEC Geomatrix
- John A. Martin, Jr., S.E., President, John A. Martin and Associates, Inc.
- Richard Niewiarowski, S.E., Consulting Structural Engineer, former Principal Rutherford and Chekene, Retired
- Thomas Sabol, Ph.D., S.E., Principle, Englekirk and Sabol
- Theodore C. Zsutty, Ph.D., S.E., Consulting Structural Engineer, former Professor, San Jose State University, Retired (Co-chair)

CSU Seismic Mitigation and Oversight

The California State University seismic mitigation and oversight planning effort has six elements:

1. **Mitigate urgent falling hazard concerns.** Mitigate significant life-safety threats posed by falling hazards as a priority. Falling hazard concerns identified at the 23 campuses and off-campus centers have been mitigated.
2. **Identify and broadly prioritize existing seismic deficiencies.** Identify existing buildings that pose a significant life-safety threat and mitigate these hazards as soon as practical. Prioritize these buildings into two listings; urgent and less urgent. Of the more than 200 buildings identified as potentially highly hazardous since inception, most have been retrofitted.

The currently published priority listing identifies **39** buildings as a first priority for seismic retrofit and **44** buildings as a second priority. Updating previous reporting, the following projects merit special note:

At CSU East Bay, Warren Hall remains an urgent seismic priority and occupies the number one position in the 2011/12 CSU capital program. At present the capital program identifies a partial deconstruction and renovation of the tower portion of Warren Hall. The campus is also investigating a full demolition option. In either case, the Student Services Administrative Replacement Building is now completed and has

allowed a relocation of the occupants out of the Warren Hall tower portion. The potential fall line of the unoccupied tower remains a concern.

Design funding for a Warren Hall seismic strengthening/renovation project was included in the 2008/09, and 2009/10 Governor's Budgets, but not supported by legislative subcommittees due to absence of state funded support and reluctance by the Department of Finance to fund seismic projects via Lease Revenue bonds. We will be seeking funding again in 2011/12.

Separately, Parking Structure 88 at San Francisco State University was added to the Priority 1 listing based on campus-observed deficiencies found in December 2009. Design is currently underway and a contractor has been selected. Renovation work is expected to begin in early 2011. The parking structure remains in use and is envisioned to remain partially so during a planned phased renovation.

3. **Perform periodic re-evaluation of existing facilities.** A second comprehensive systemwide seismic assessment was completed in 2008. Since then individual buildings have been reviewed and evaluated. The results of these evaluations are reflected in periodically updated CSU Seismic Priority Lists.
4. **Provide peer review for all major construction.** Assure that all CSU new construction and modification of existing structures have independent, technical peer review of the seismic performance aspects of the proposed design. The California Building Code includes provisions applicable to renovation work for state projects. Specifically, CBC Chapter 34 contains criteria and triggers that work to systematically raise the level of seismic safety for existing building stock over time whenever any structural modification, alteration or addition to the structure is undertaken. The SRB closely monitors this compliance as a part of its peer reviews.
5. **Have in place a Seismic Event Response Plan.** The CSU Seismic Policy has a proven methodology in place to respond in the case of a significant seismic event. This includes:
 - Based on reporting of a significant seismic event SRB chair or co-chair contacts potentially affected campus(es) to assess situation.
 - Determination made by SRB chair if on-site field visit by SRB member is required.
 - As warranted, SRB member (and/or CSU Building Official/Chief of Architecture & Engineering) travels to affected campus(es).
 - Immediate post-quake seismic safety assessments begin. Buildings are reviewed and posted as 'Lawful Occupancy Permitted', 'Restricted Use', or 'Unsafe'. Above parties validate any initial campus first-responder postings that were made. Per CSU Seismic Policy and confirming systemwide memo on this topic, seismic postings are enforced by campus police.
 - Follow-up inspections and repair strategies begin after initial assessments made.

Page 5 discusses the application of this policy relative to the April 4 Calexico quake.

6. **Conduct seismic related staff training.** CSU facilities planning and construction staff are afforded systemwide training on project management, building code, building official responsibilities and seismic emergency response and assessment procedures. *The most recent such training was offered in September, 2010.*

Summary of 2009/2010 Seismic Review Board Activities

1. Due to budget constrains CSU-centric Board meetings were severely curtailed, however the Seismic Review Board (SRB) was still able to multiple times during the reporting time period (FY 2009/10). The majority of these meetings were devoted to providing a seismic evaluation at the request of, and funded by, the UC Office of the President. CSU-centric meetings resumed in May and September 2010.
2. The SRB remained available and continued to provide seismic and structural engineering technical support to the Chancellor's Office and campuses.
3. The CSU SRB peer review system remains in place. Peer reviews continued and were completed for construction projects in accordance with the Trustee's policy. This includes all new construction and all construction projects that modify the structural characteristics of existing structures, regardless of their extent.
4. The CSU/SRB has taken a lead role with support by the University of California and California Community Colleges, Department of General Services, and other state agencies, in developing a series of code improvement proposals that will be included as a part of the next California Building Code update (January 1, 2011). The changes include a provision for a CSU building official and improvements to various seismic technical standards. Together these additions codify desired technical and operational practices that the CSU currently, by policy, operates under.
5. The Trustees' *CSU Seismic Requirements* administrative section was unchanged for the 2009/10 period. The current edition (July 13, 2009) will see administrative and technical updates in the next reporting period.
6. The CSU Seismic Retrofit Priority List is routinely evaluated and updated. Projects are removed as renovations occur and other projects are added as conditions warrant. We reiterate that the list has grown in number of entries from years earlier editions. Several of these listings are likely to be correctable at a cost below minor capital project thresholds. Budget constraints however are anticipated to severely limit available funds near term for such renovations.

The Trustees' *CSU Seismic Requirements* and Priority Lists are maintained available online at: http://www.calstate.edu/cpdc/ae/review/seismic_peer.shtml

7. There was one seismic event within the 2009/10 reporting period that caused the CSU SRB emergency response plan to activate. The following is a recap of the Calexico earthquake and the CSU response:

A magnitude 7.2 (!) earthquake occurred at 3:40 PM Sunday April 3, 2010 in the upper end of Baja California. Peak Ground Accelerations (PGA's*) of 0.27g were recorded in Calexico. The propagation of the event seemed to be directed to the north with a long, low, rolling motion widely experienced up to and throughout the Los Angeles basin as a result. 90 miles to the west in San Diego the intensity fell off dramatically and only minor PGA's of 0.05g were recorded. (* Very roughly, the forces experienced in Calexico were about half of what new construction at that location would be designed to using current building code standards.)

When a significant seismic event occurs, predefined CSU and SRB actions are triggered. Initial damage assessments by campus first responders are promptly relayed to Chancellor's Office senior management and the CSU Building Official/Chief of Architecture & Engineering. The SRB Chairman confers with potentially affected campuses to determine if an on-site presence by the SRB is warranted. If so, the Chair of the SRB is pre-designated and empowered to act as a Special Deputy Building Official to make Campus Police-enforceable building occupancy posting assessments in an immediate post-earthquake period regarding the safety of buildings where structural damage has occurred. Once initial life-safety assessments are made follow-up structural repair strategies can be developed.

In the Calexico event, we were able to review the US Geological Survey (USGS) technical reporting, essentially in real time, and assess that a low likelihood of potential for risk to CSU facilities existed. About 15 minutes later, media reports began to confirm that negligible damage was being reported. No injuries were reported.

In follow up with SDSU the next morning, campus staff reported some minor physical damage (waterline break) had been addressed at the Calexico campus. Upon subsequent review by campus first responders however, additional building damage and cracking was observed and it was decided to mobilize a SRB field response. This field response by SRB Board Member Greg Brandow, Chancellor Office Building Official, Thomas Kennedy, and SDSU campus staff occurred on Tuesday April 5. Upon review widespread (repairable) cosmetic damage was apparent. No structural damage found.

No building occupancy restriction posting was required. A summary letter was issued and the SRB response was deemed complete. If the event had warranted evacuations or postings these would have occurred in accordance with the CSU Seismic Emergency Response plan.
