

## **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 2008 to June 2009.

#### **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 has identified the seismic hazard within its existing building stock and is in the process of completing their mitigation.

## 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., Principle, Rutherford and Chekene
- Thomas Sabol, Ph.D., S.E., Principle, Englekirk and Sabol
- Theodore C. Zsutty, Ph.D., S.E., Consulting Structural Engineer, 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. Identified falling hazard concerns 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 41 buildings as a first priority for seismic retrofit and 39 buildings as a second priority. Updating previous reporting, the following merits special note:

*At CSU East Bay, the Student Services Administrative Replacement Building is under construction. Completion of this building will permit occupants of Warren Hall to vacate the building during a future seismic strengthening and renovation project. The design funding for Warren Hall was included in the 2008/09 Governor's Budget, 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. As a seismic repair, Warren Hall remains an urgent seismic retrofit priority and the CSU continues to seek funding for the project.*

3. **Perform periodic re-evaluation of existing facilities.** A second comprehensive systemwide seismic assessment has now been completed. The results of these evaluations are reflected in the updated CSU Seismic Retrofit 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 campus visit by SRB chair is required.
  - As warranted, SRB chair (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 '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 July 29, 2008 Chino Hills 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. Current year systemwide training has been substantially curtailed due to state budget constraints.

#### **Summary of 2008/2009 Seismic Review Board Activities**

1. The Seismic Review Board (SRB) met five times during the reporting time period (FY 2008/09), two meetings at the Chancellor's Office, one meeting at CSU Chico, and two meetings at University of California locations. The January Seismic Review Board meeting was canceled as a part of the suspension of the CSU capital program that occurred in December-January 08/09 due to the state budget crisis.
2. Apart from the cancelation of the January meeting, 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 in developing along with University of California and California Community Colleges, Department of General Services, and other state agencies, a series of code improvement proposals for adoption into the next update of the California Building Code. The proposals include a provision for a CSU building official and improvements to various seismic technical standards. Together these proposals seek to codify desired technical and operational practices that the CSU currently, by policy, operates under.

These code development meetings also acted to build and strengthen relationships between our respective higher education sectors. During the period CSU and CSU-SRB have provided support to University of California and California Community Colleges capital program efforts as discussed in the following points.

5. At the request of the California Community College Chancellor's office, the chairman of the SRB and CSU staff provided advice on how to implement a code enforcement and seismic review process for the Community Colleges Districts. CCC is adapting the CSU approach as its model to its institutional setting and needs. Recently approved legislation (SB588) cited CSU practices as the reference standard for CCC actions. CSU worked with DSA and CCC to implement the technical aspects of the legislation.
6. At the requests of the University of California Office of the President, the CSU SRB is in the process of concluding a study of four UC-occupied buildings at San Francisco General Hospital (SFGH). The purpose of this study was to ascertain potential risks in continued occupancy of known seismically deficient buildings for a set time period relative to vacating the existing buildings and moving into renovated or new construction immediately. This report will provide a statistical risk assessment opinion to the UC Office of the President that will assist them make an informed decision on balancing the benefits derived from the educational and research programs continued uninterrupted operation against potential risks of continuing such operations in existing and seismically deficient capital facilities. This assessment methodology is transferable to other capital projects and could be used by the CSU to additionally inform and help prioritize its own future seismic retrofits.
7. The Trustees CSU Seismic Requirements administrative section was updated. The current edition (July 13, 2009) incorporated various editorial and technical revisions. Key among them was an update to the 'earthquake table' (Attachment D – Earthquake Performance Levels for Existing Buildings). This updated table provides the latest concordance with code technical references, peer review equivalencies, a translation equivalency for University of California requirements and a historical conversion from the now obsolete, 1994 DSA Risk Acceptability Table. This table, in particular, is being used to support a CSU-led, multi-

agency effort to overcome Department of Finance reluctance to utilize Lease Revenue Bond funding for seismic projects.

8. The CSU Seismic Retrofit Priority List was updated. Note that the list has grown in number of entries from the previous editions. The current (9/16/08) listing reflects the recent seismic re-review of the systemwide capital stock. It should be noted that 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. As reported separately in the Categories and Criteria document, CSU seismic retrofits will be a priority for whatever limited capital funding that may become available during 2010/11.

The Trustees' *CSU Seismic Requirements* and Priority Lists are maintained available online at: [http://www.calstate.edu/cpdc/ae/review/seismic\\_peer.shtml](http://www.calstate.edu/cpdc/ae/review/seismic_peer.shtml)

9. There was one earthquake within the 2008/09 reporting period that caused the CSU SRB emergency response plan to activate.

The following is a recap of the July 29, 2008 Chino Hills seismic event and the CSU response. This was reported in last year's annual report and is included here for completeness as this event occurred during the reporting period.

A magnitude 5.4 earthquake occurred at 11:42 AM in Chino Hills, about 25 miles southeast of Los Angeles. Peak ground motions of 0.185g were recorded at the Fullerton campus and on the order of 0.16g at Pomona.

*When a significant seismic event occurs, predefined CSU and SRB actions are triggered. Initial damage assessments by campus first responders are relayed within an hour 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.*

Within one hour of the Chino Hills event both the Fullerton and Pomona campuses had been contacted to determine whether SRB mobilization was required. The initial reports were that damage had not occurred, but that shaking was intense. The decision was made early the afternoon of the earthquake that mobilization was not required. This determination was re-validated by various field observations the following morning. By 9 AM the following day both campuses reported that their consulting structural engineers and campus staff inspections were indicating no significant structural damage to any building. Some non-structural damage was reported (cracks in gypsum board walls, light fixtures, etc.) and few cracks were noted in some concrete structures, but they were evaluated as not significant.

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Based on the July 30 campus consultations it was determined that additional actions were not warranted and the Chino Hills response effort was deemed concluded.

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