

## **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 2007 to June 2008.

#### **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, Geomatrix Consultants
- 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 33 buildings as a first priority for seismic retrofit and 30 buildings as a second priority. As an update to 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 the 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 lack of support for a 2008 General Obligation bond. 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 in 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.

#### **2007/2008 Seismic Review Board Activities**

The Seismic Review Board (SRB) met five times during the reporting time period (FY 2007/08), two meetings at the Chancellor's Office and three meetings at campuses (Bakersfield, Sonoma, San Diego). The SRB members provide peer review of design and construction activities at all of the campuses and provide technical support to the CSU Building Official and the Deputy Building Official at each campus.

Notable activities of the SRB since the last report to the trustees include the following:

1. Provided seismic and structural engineering technical support to the Chancellor's Office and to the campuses.

2. Peer reviews are underway or 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.
3. Administrative sections of the trustees' *CSU Seismic Requirements* were revised to reflect the modifications of the State Building Code contained in the 2007 Edition. This changed the basis of the California Building Code seismic requirements from the Uniform Building Code, to the American Society of Civil Engineers ASCE 7-05 standard. The Seismic Policy and its tables were updated to reflect these new standards.
4. A lease/purchase standard for CSU was incorporated into the *CSU Seismic Requirements*. The standard for the seismic evaluation of acquired facilities, developed principally by CSU, is now actively used by the University of California (UC) and is *de facto* used by the Department of General Services (DGS). Effectively CSU, UC and DGS are using the same seismic evaluation as part of the real property acquisition due diligence report.
5. Reviewed the fault investigation for the Student Housing project at Humboldt. The soils engineer had identified a fault that passed through the site. Under the direction of the SRB assigned peer reviewer, a fault investigation was conducted that demonstrated that there are no active fault traces within the planned development. This is the second project for which such an investigation has been conducted at Humboldt.
6. At the request of the California Community College Chancellor's Office, the chairman of the SRB and CSU staff have provided advice on how to implement a code enforcement and seismic review process for the Community Colleges Districts. CCC is adapting the CSU's model to its institutional setting and system needs. Legislation currently under consideration cites CSU practices as the referenced standard for CCC actions.
7. The CSU Seismic Retrofit Priority List has been updated. There are two parts: Priority List 1, those projects that are recommended as priority actions to be undertaken solely because of the seismic hazard posed by the building; and second, Priority List 2 identifies buildings that have significant seismic issues that need to be recognized when the campus is contemplating alterations or modifications of the building. The latter is to recognize the seismic issues of the building during the planning stage for such modifications or alterations. The CSU Seismic Retrofit Priority Lists are regularly reviewed and periodically updated to reflect changes due to construction activity, physical building reviews, and code changes as may occur.
8. There were no earthquakes within the time period that required safety assessments of a campus. While outside the reporting period, a few comments on the July 29, 2008 Chino Hills seismic event are warranted. 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 of the order of 0.16g at Pomona.

As noted earlier, 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.

The trustees' *CSU Seismic Requirements* and updated Seismic Retrofit Priority Lists are available online at [http://www.calstate.edu/cpdc/ae/seismic\\_contracts.shtml](http://www.calstate.edu/cpdc/ae/seismic_contracts.shtml).