

COMMITTEE ON CAMPUS PLANNING, BUILDINGS AND GROUNDS

California State University Seismic Review Board Annual Report

Presentation By

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Summary

This information item presents the CSU Seismic Review Board Annual Report.

Seismic Policy and Review Board

The California State University has addressed the seismic hazard posed by its buildings and is in the process of completing their mitigation. 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).]

CSU initiated the assessment of the seismic hazards posed by CSU buildings as directed by Governor Deukmejian's executive order and legislative provisions. The CSU Seismic Review Board (SRB) was established to advise and assist in determining the condition of CSU buildings, and to technically oversee the program. The SRB is comprised of:

CPB&G

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- Charles Thiel Jr., Ph.D., President, Telesis Engineers and Consulting
- John A. Martin Jr., S.E., President, John A. Martin and Associates,
- Greg Brandow, Ph.D., President, Brandow and Johnson, Adjunct Professor USC
- Ted Zsutty, Ph.D., S.E., Professor, San Jose State University, retired
- James Hill, S.E., President, James Hill and Associates
- Sven Nielson, S.E., Principal, Johnson and Nielsen Associates
- John Egan, G.E., Geomatrix Consultants

Seismic Mitigation and Plan

As of September 2002, the majority of CSU buildings identified as posing a life-safety hazard to the students, staff and faculty have been mitigated. The CSU plan has four elements:

1. Mitigate significant life-safety threats posed by falling hazards as a priority. All such hazards at all 23 campuses and off-campus centers have been mitigated.
2. Identify those buildings that pose a significant life-safety threat and mitigate these hazards as soon as practical. Of the over 200 buildings identified as potentially highly hazardous since inception, most have been retrofitted, and only 8 priority buildings remain to have retrofit design initiated. See pages 3 and 4 for the *CSU Seismic Retrofit Projects*.
3. Systematically raise the level of seismic safety for deficient buildings whenever any structural modification, alteration or addition to the structure is undertaken. This is through application of Division VI-R requirements for all construction; particularly those circumstances identified as warranting action.
4. Assure that all CSU new construction and modification of existing structures have independent, technical peer review of the earthquake performance aspects of the plans. Review continues through construction.

Initially, the SRB identified approximately 120 buildings as warranting retrofit action under number 2 above, which has now grown to over 200 buildings due to the following:

- The CSU system has added three new campuses: Monterey Bay, Channel Islands, and the California Maritime Academy. The principal academic buildings of the Maritime Academy were determined to be constructed on a liquefiable site, since structurally stabilized. Additional buildings have also been acquired by the system.
- The 1994 Northridge earthquake clarified hazards posed by some construction types and conditions. Welded steel moment frame buildings and certain connection details were shown to be performing poorly, causing reassessment of steel structures statewide. Concrete moment

frame parking structures were identified as particularly hazardous, and are not encouraged for new construction.

- New geotechnical hazards were also identified. In 2002, after several years of scientific study, the San Jose Fault in Pomona was determined to be active. Twenty-three buildings at the Pomona campus traverse portions of this fault. Safety assessments are complete for these buildings and retrofit designs to accommodate fault displacement have begun.
- Some buildings initially assessed as adequate have been deemed to pose a higher hazard than previously assessed, sufficient to warrant mitigation action. All CSU buildings are reassessed periodically to assure that serious hazardous conditions are addressed. The majority of the newly identified buildings have subtle conditions dominating their expected performance that had not previously been identified. The threshold for concern has remained unchanged since 1992.

The CSU SRB has performed several other functions to further seismic safety and provide a broad experience to benefit the CSU system. The SRB prepared the seismic retrofit standards for existing buildings now part of the California Building Code. These were developed to address CSU facilities, and now apply to all state-owned buildings as the only comprehensive seismic provisions for existing buildings. At the request of the Office of Statewide Hospital Planning and Development, the SRB then extended these to include all acute care hospitals. The SRB provided peer review of the California Community Colleges' evaluation of the seismic hazard posed by their buildings.

The CSU program is regarded as one of the best administrative programs to achieve seismic safety for its facilities of any state agency. CSU can be proud that in ten short years it has identified the extent of the seismic life-safety problem posed by its facilities, has resolved most of them, has a near term plan to resolve the few remaining issues, and has taken forceful actions to assure additions to the building inventory provide adequate seismic safety.

Seismic Retrofit Projects

The following projects are part of the CSU Seismic Retrofit Program. Those projects in the first box are recommended for completion on a priority basis and have a Division of the State Architect (DSA) rating of 6. Delays in mitigating the seismic hazards for these structures are not warranted. Those projects in the second box have identified seismic deficiencies that require mitigation when practical; these have DSA rating 5. Action to mitigate these hazards is recommended whenever any structural modification, alteration or addition to the structure is undertaken, notwithstanding whether Title 24, California Building Code, Section 16, Division VI-R may so require.

Retrofit Projects

Campus	Building	CSU Rank	DSA	State/ Non-state	Status
Hayward	Warren Hall (beam-column)	75.00	6	State	In design
Pomona	CLA Above Grade	72.94	6	State	In design
Hayward	Library	64.68	6	State	In design
Hayward	Student Service Hub	64.68	6	State	Assessment underway
San Francisco	Library	43.83	6	State	Funded for design
Long Beach	Engineering 2	42.61	6	State	Await retrofit design
Long Beach	Liberal Arts, LA4	42.61	6	State	Await retrofit design
Long Beach	Liberal Arts, LA3	42.61	6	State	Await retrofit design
Long Beach	Liberal Arts, LA2	42.61	6	State	Await retrofit design
Pomona	Kellogg West	35.02	6	Non-state	In design
San Francisco	Residence Apartment Building.	35.40	6	Non-state	In design; unoccupied
Long Beach	Bookstore	35.02	6	Non-state	Being assessed
Long Beach	Day Care Center	35.02	6	State	Assessment underway
Humboldt	Library	21.99	6	State	In design
San Luis Obispo	Boiler Plant	23.36	6	State	Funded for construction
Pomona	Los Olives Commons	23.16	6	Non-state	In design: SJ fault trace & vibration
Humboldt	Theater Arts	21.59	6	State	In design
San Francisco	Humanities South	20.45	6	State	Bldg. shored: await demolition

San Francisco	Old Administration	17.79	5	State	Assessment underway
Pomona	Admission	14.52	5	State	In design: SJ fault trace
Pomona	Old Science	14.52	5	State	Await design: SJ fault trace
Pomona	Art Building	14.52	5	State	Await design: SJ fault trace
Pomona	CLA Below Grade	14.52	5	State	Await design: SJ fault trace
Los Angeles	Physical Science	11.98	5	State	Funded for design of replacement
Los Angeles	Kennedy Library North	8.61	5	State	Await design for precast panel support
Chico	Whitney Hall	8.28	5	State	Await retrofit design
Fresno	Industrial Technology	8.11	5	State	Await retrofit design
Stanislaus	Science	8.11	5	State	Working drawings complete
Chico	Science	7.75	5	State	Await assessment
Pomona	President's Residence	5.00	5	State	Await retrofit design: SJ fault trace
Fresno	Wall anchorages for tilt-ups	4.74	5	State	Await retrofit design
Pomona	University Annex	3.70	5	Non-state	Await retrofit design
Fresno	Student Union	3.60	5	Non-state	Await retrofit design
Stanislaus	Student Union	2.87	5	Non-state	Design complete
Stanislaus	Dramatic Arts	1.41	5	State	2003 project