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March 8, 2024

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RE: Seismic Safety Commission Report

The attached report to California's Seismic Safety Commission provides several examples of the California State University's (CSU) multi-faceted approach to ensuring seismic safety for all CSU students, staff, and faculty. This includes earthquake outreach, earthquake training and exercises for response staff, stringent seismic requirements, and a robust seismic response protocol.

The devastating impacts to our CSU Northridge campus following the 1994 Northridge Earthquake has left the CSU with a strong legacy of earthquake awareness and preparedness. CSU has 23 campuses throughout California, all of which are exposed to earthquake hazards. The safety of CSU students, staff, and faculty is an institutional priority. The design and maintenance of seismically sound infrastructure paired with

CSU Campuses
Bakersfield
Channel Islands
Chico
Dominguez Hills
East Bay

Fresno
Fullerton
Humboldt
Long Beach
Los Angeles
Maritime Academy

Monterey Bay
Northridge
Pomona
Sacramento
San Bernardino
San Diego

San Francisco
San José
San Luis Obispo
San Marcos
Sonoma
Stanislaus

CSU Report: Seismic Safety Commission Report

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community preparedness efforts through ongoing education, training & exercises facilitate the development of safe CSU communities that support student success.

This report is sent in compliance with 8589.75 of the government code and requires the Seismic Safety Commission to report to the Governor and Legislature on the seismic safety risk reduction and recovery programs of California. CSU's report is due by March 8, 2024, and will be presented at the April 10th meeting of the CA Seismic Safety Commission.

Should you have any questions about this report, please contact Nathan Dietrich, Assistant Vice Chancellor, Advocacy and State Relations at (916) 445-5983.

Sincerely,



Bradley Wells (Mar 8, 2024 13:53 PST)

Steve Relyea
Executive Vice Chancellor and
Chief Financial Officer

SR:dr

Full report posted to <https://www.calstate.edu/impact-of-the-csu/government/Advocacy-and-State-Relations/Pages/legislative-reports.aspx>

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**CA Seismic Safety Commission
2024 CSU Report**

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About CSU

The California State University (CSU) is the nation's largest four-year university system. CSU has 23 universities across California, spanning 800 miles from Humboldt County to San Diego County. CSU has an annual student population of over 450,000 and a faculty & staff population of approximately 56,000. Of these campus community members, approximately 60,000 are residents of CSU campuses. CSU is known for excellence in undergraduate studies and producing an educated workforce for California. CSU operates over 2,130 buildings totaling 94.4 million square feet and over 3 million square feet of outdoor fields in 29 California counties.

The CSU is led by a board of 25 trustees, who are appointed by the Governor. The CSU Chancellor is appointed by the Board of Trustees and maintains an office for systemwide operations out of Long Beach, CA. The Board of Trustees also appoints a President for each of the 23 universities.

Within the Chancellor's Office, Systemwide Emergency Management & Continuity is responsible for Emergency Management policy and guidance on earthquake training, exercises and awareness education. The Capital Planning, Design & Construction Department maintains an Office of Architecture, which is responsible for maintaining CSU's seismic design requirements and for coordinating seismic assessments following an earthquake event.

Each campus has an Emergency Manager and a Campus Deputy Building Official that coordinate emergency response and damage assessment during earthquake response.

Legacy of Earthquake – Northridge at 30 years

On January 17, 1994 a magnitude 6.7 earthquake struck approximately one mile from CSU Northridge (CSUN). Fortunately, there were very few people on campus at the time of the earthquake because it occurred before dawn on a holiday. The earthquake caused damage to all buildings on the university, many requiring significant repairs, and one parking structure was demolished as a result of the earthquake. CSUN's buildings were under construction after the earthquake for eight years. During the first years following the earthquake, many classes were held in modular buildings on campus.

It has now been 30 years since the Northridge earthquake, and the legacy of this earthquake continues within the CSU system. On Saturday, February 3rd, CSUN hosted a 30-year remembrance event in partnership with the Earthquake Country Alliance. The event included a screening of the *Quake Heroes* film about the Northridge earthquake.

CSU's Director of Systemwide Emergency Management & Continuity recently presented on the legacy of this earthquake at the 2023 UC Merced Safety Conference. The presentation demonstrated the severe impacts to operations that earthquakes can cause and facilitated discussion around the impacts of today's technologies that may alter the way we recover and resume operations after an earthquake.

In 2016, CSUN hosted an innovative preparedness event for students that was based around the Northridge Earthquake. The 'Beat the Quake: An Earthquake Themed Escape Room' challenged groups of students to solve a series of puzzles, which included earthquake knowledge and mitigation skills to prepare for earthquakes. This interactive event was both educational and entertaining for students and engaged over 100 students in hands-on learning.



Figure 1 CSUN's "Beat the Quake"

Education & Outreach

Great Shakeout Earthquake Drills

The CSU and its campuses actively participate in the annual October Great Shakeout Earthquake Drill. 83% of the CSU's 23 campuses have registered as participants for more than 10 years, with 8 of them having been participants since the inaugural Shakeout in 2008. Even despite the challenges posed during the height of the COVID-19 pandemic in 2020, 13 campuses held some form of drill for the event, whether in-person, virtual, or a combination of both. Since 2019, an average of 355,000 CSU individuals have participated in the Great Shakeout.

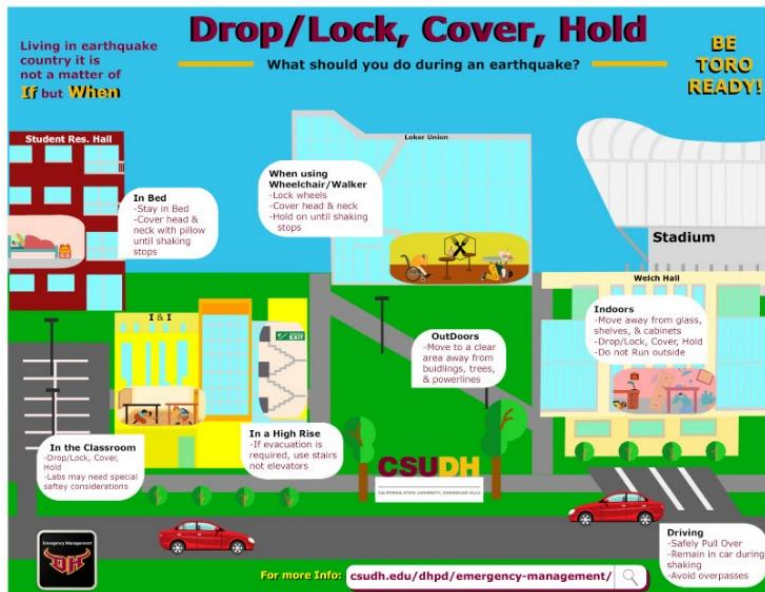


Figure 2 Example of educational outreach material from CSU Dominguez Hills

The Great Shakeout Drill provides CSU campuses an opportunity to test their emergency notification systems and provide education on the crucial "Drop, Cover, and Hold" earthquake safety practice.

Shakeout drills are frequently held in conjunction with campus outreach initiatives, such as tabling events and general emergency preparedness campaigns. Some campuses use engagement activities like "take a selfie" contests, which encourage active participation in the drill and raise awareness about earthquake preparedness.

Campus Examples of Earthquake

Education and Outreach

In October of 2023, two CSU campuses were part of the California Office of Emergency Services (Cal OES) seven-city "Great California Shakeout Tour." The purpose of the tour was to raise awareness about

earthquake preparedness across the state. One of the highlights of the tour was an earthquake simulation trailer, where participants could experience the sensation of earthquakes ranging from 3.0 to 7.0 magnitude.

Emergency managers at both Cal Poly San Luis Obispo and San Francisco State University proactively worked with Cal OES to bring this experience to their respective campuses. By partnering with the state agency, these universities enhanced their own pre-Shakeout efforts to promote earthquake preparedness among their campus communities, with a particular focus on students. The collaboration not only provided access to important information and resources related to emergency safety but also facilitated outreach about California's early earthquake warning system and the MyShake application.

Active engagement with Cal OES and other partner agencies, such as demonstrated by these two universities, is a goal of CSU emergency management systemwide. Collaborations like these are one way the CSU commits to ensuring the safety and well-being of their students and staff through the impacts of any hazard, including those caused by earthquakes.



Figure 3 SFSU's Emergency Manager tries the earthquake simulator

Earthquake Emergency Plans, Training & EOC Exercises

Chino Hills Shaker Exercise 2022

In early 2022, Systemwide Emergency Management & Continuity began planning the first functional exercise for CSU's Systemwide Emergency Support Team (SWEST). The Chino Hills Shaker exercise utilized an earthquake scenario to test the coordination between SWEST and impacted campuses as well as our damage assessment processes. Cal Poly Pomona's Emergency Operations Center also played in the exercise and both sites utilized a common Simulation Cell.

The planning team for the Chino Hills Shaker Exercise was comprised of emergency managers throughout the CSU system. These professionals brought a key level of insider knowledge and expertise that facilitated the development of an exercise that addressed unique CSU and higher education emergency management needs. Personnel from a total of 10 CSU campuses assisted with the planning and implementation of the exercise: CSU Monterey Bay, CSU Los Angeles, CSU Long Beach, Cal Poly Pomona, San Francisco State University, San Jose State University, Cal Poly Humboldt, Cal Poly San Luis Obispo, CSU Channel Islands, and Stanislaus State.

The June 2022 exercise was conducted in partnership with University Architects to incorporate the Seismic Review Board's emergency response protocol into the exercise design. Multiple seismic review board members participated to enhance the realism of the damage assessment process.

Training

In July 2023, CSU Monterey Bay hosted a one-day CalOES Safety Assessment program training. The training was held virtually and open to all CSU staff through CSU's Systemwide Learning & Development team. A total of 59 CSU staff attended the training, which allows structural engineers to earn Safety Assessment Program credentials.

In October 2022, CSU hosted a case study webinar with the University of Alaska Anchorage to learn more about the impacts of the 2018 Cook Inlet Earthquake. The presentation shared multiple departmental perspectives on the recovery process and how the university has changed its preparedness plans as a result of the earthquake.

Hazard Vulnerability Risk Assessment

In 2021, CSU published a systemwide Hazard Vulnerability Risk Assessment. Earthquake was one of many hazards analyzed for potential impacts within the CSU system. The assessment revealed that all 23 CSU campuses and the Chancellor's Office are exposed to earthquake hazards. This assessment provides justification for continued earthquake mitigation, preparedness, and planning measures on all campuses.

Campus Exercise / Training Examples

Emergency Operations Center (EOC) Exercises

On June 15 and 16, 2022, Sonoma State University conducted full-day exercises with its EOC, Facilities Management (FM), and Information Technology (IT) staff and leadership. The exercise scenario simulated a Magnitude 6.2 earthquake on the Rodgers Creek Fault, resulting in flooding, fires, and other damages. A simulation cell placed calls to the 30 EOC and 100 IT and FM participants to mimic information flow from campus community members, officials, and SSU leadership. The exercise focused on response and communication mission areas, including operational communications, field response, and emergency response (such as how to conduct a needs assessment for incidents causing physical damage).

EOC and field response units successfully established communication channels and effectively managed the simulated emergency. An After-Action Report identified several areas for improvement, including formalizing EOC roles for employee accounting and IT processes for acute emergencies; better coordination of emergency operations and communications within internal departments; and formalizing procedures for activating a call center in the event of an earthquake.

Additional Campus Examples



Figure 4 San Jose State's EOC during a 2022 earthquake exercise

Our other campuses frequently hold EOC exercises related to earthquake preparedness. These trainings are sometimes conducted in conjunction with systemwide exercises, such as the Chino Hills Shaker in which Cal Poly Pomona activated its EOC for a functional exercise.

They are also conducted independently of the Chancellor's Office by campus emergency management staff. In 2021 CSU East Bay conducted a 2-day tabletop training for campus Housing staff that included an earthquake scenario. In February 2021, CSU Northridge held a virtual tabletop with its EOC policy group on earthquake operations and recovery. And in 2022, San Jose State University held an EOC tabletop exercise that included an earthquake scenario.

Earthquake Mitigation and Rapid Response

CSU Seismic Policy and CSU Seismic Requirements

The CSU has a vigorous program of maintaining the seismic integrity of its existing structures as well as ensuring a high-quality standard for design and construction of all its new and retrofitted facilities. The CSU developed a system for reviewing the seismic safety of all new projects and identifying, rating, or prioritizing the potential seismic hazard posed within the system.

CSU initiated its program in 1992 with the formation of the CSU Seismic Review Board (SRB). The University undertook the assessment of the seismic hazard posed by the entire University's building stock at the direction of Governor Deukmejian in 1992 with resources provided by the Legislature in 1993 - one year prior to Northridge Earthquake on January 17, 1994. The CSU conducted a rapid assessment of all CSU buildings on every campus and associated locations in 1993 and initiated a process of seismic engineering peer review of all proposed new and retrofit projects. Since then, CSU has reduced the unacceptable seismic risk of its owned, constructed, acquired, and leased buildings based on self-imposed criteria and enforcement to acceptable safety levels. Assessment of seismic issues also entails gravity and wind loads as necessary. As a result, the CSU Board of Trustees on May 18, 1993, adopted the following policy to apply to all CSU construction projects:

RESOLVED, by the Trustees of the California State University, that the following policy is adopted:

It is the policy of the 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 University operations and activities occur...
[Approved by the Trustees of California State University at its May 18-19, 1993 meeting (RTCPBG 05-93-13).]

The CSU SRB is comprised of 6 or 7 members who are design professionals (structural/civil engineers) with expertise in lateral forces and the effects of earthquake on large institutional buildings. Membership requires these professionals are not otherwise affiliated with the University system; they are not employed by the CSU. Board members are appointed by and serve at the discretion of the Office of the Chancellor. Besides assessment of existing buildings, the SRB is also charged with implementing independent peer reviews for new projects.

After 2000, the CSU Office of the Chancellor and SRB produced the first draft of the CSU Seismic Requirements; the document has evolved and now is 63 pages with periodic updates every 3 to 4 years; see the link: [CSU Seismic Requirements.pdf \(calstate.edu\)](http://calstate.edu/CSU_Seismic_Requirements.pdf). The Seismic Requirements describe the CSU framework used to implement the Trustees' Seismic Policy. The key objectives and requirements are as follows:

1. The goal is, to the maximum extent feasible by present earthquake engineering practice, to provide an acceptable level of earthquake safety when acquiring, building, maintaining, and rehabilitating buildings and other facilities.

Actions necessary to accomplish this goal were initiated in 1992 for existing buildings and will continue until all CSU existing buildings meet the seismic safety objective of the Trustees and all new construction meets this goal. Each year capital expenditures are recommended until the unacceptable safety hazard buildings are seismically retrofitted or removed from service.

2. The CSU Seismic Requirements apply to all new construction ensuring the design meets the life safety and damageability objectives of California Code of Regulations, Title 24 applicable provisions. In addition, the Requirements also apply to all renovation and maintenance construction for life safety protection consistent with that for typical new buildings.
3. Independent technical peer reviews are conducted concerning the seismic aspects of all construction projects from their design initiation, including new construction, maintenance, and remodeling, for conformance to good seismic-resistant practices consistent with these CSU requirements.
4. The feasibility of all construction projects shall include seismic safety implications and is determined by weighing the practicality and cost of protective measures against the severity and probability of injury resulting from seismic occurrences.

The CBC establishes minimum standards for building safety. The CSU Standard may require more demanding considerations than what current (building) code and referenced technical standards require where the SRB review indicates it is necessary to achieve the Trustees' standard of seismic performance.

By law, California State University is required to enforce the current edition of the adopted applicable elements of the California Code of Regulations, Title 24 in its entirety as adopted by the California Building Standards Commission (CBSC). These Seismic Requirements supplement the requirements of the Code (Parts 1 through 12). Where CSU requirements differ, the more restrictive apply for the design and construction of CSU buildings and structures. For existing buildings, it should be noted that CSU standards became the basis for language added to the California Existing Building Code (CEBC) – specifically CEBC Section 317.3.1 – setting requirements when seismic assessments are required for improvements to existing buildings.

In addition, every eight years as part of the CSU Seismic Building Assessment Program, the SRB examines and assesses existing buildings on each campus – three campuses per year on a rotating basis. This ongoing assessment process which functions as seismic risk management for the CSU building stock has been underway since 1993. The program is in conjunction with the Seismic Priority Lists (SPL) where existing buildings with deficiencies are listed and prioritized with and as funding for seismic upgrades become available. The objective is to provide prudent, legally defensible, and transparent risk management decisions for all 23 campuses of the CSU. The CSU Seismic Building Assessment Program along with the SPL are outlined in more detail within the CSU Seismic Requirements.

Links to Referenced Documents	
CSU Seismic Requirements	Link
CSU Seismic Priority List	Link

Seismic Response

When a substantial earthquake occurs near a CSU campus or facility, there is need for evaluation of the safety of buildings and facilities at the university campus. The CSU has developed SRB Emergency Response Protocols when a university campus experiences significant damage as the result of a substantial seismic event. In such an event, the Chair, Vice Chair, or another SRB member of the SRB is empowered to act as an Emergency Designated Building Official (EDBO) for the purposes of structural safety determinations for the University campus.

After any significant seismic event, the EDBO will contact the CSU University campus to determine if damage has occurred at the campus; if determined that there is significant damage, the EDBO will travel to the campus as soon as time and conditions permit. Note that in the event of an emergency due to substantial earthquake with reported significant damage, the Office of the Chancellor may activate the Virtual Emergency Operations Center (VEOCI) and will likely establish a separate (physical) Emergency Operations Centers (EOCs). Coordination/communication with the EOC is maintained between the Office of the Chancellor and the EDBO as the EDBO is in route.

The EDBO is authorized to evaluate the safety of buildings on the University campus and make recommendations for additional engineering investigations to determine the condition and appropriate actions to repair individual buildings. The EDBO will oversee and/or conduct visual “rapid” evaluation to determine the extent of damage; applied Technology Council (ATC) 20-1 or an acceptable equivalent are used for the visual evaluations and placards are posted – Green, Yellow and Red . These designations shall be enforced to limit the risk to occupants until such time as the placard is modified or removed.

The restoration of any damaged building shall be completed to the requirements of CEBC and the CSU Seismic Requirements. Plans for all repairs shall be approved for implementation by the EDBO or the CSU Building Official in order to make repairs for re-occupying damaged buildings.

Recent Capital Improvements of CSU Building for Seismic Safety

As outlined above, the CSU has been actively engaged with the improvement of seismic safety for over 30 years with the help and guidance of the CSU SRB. Well over 200 buildings have been repaired, demolished and/or renovated to meet the CSU's strict seismic standards. Below are just a few examples of existing buildings in the last 8 years that have undergone seismic safety renovations and improvements.

Cal Poly Humboldt Library Renovation: The \$34 million seismic retrofit project of the 170,000 SF building began in 2018 and was completed in 2022. The renovations have improved the safety and integrity of the library based on the engineering models of a very large earthquake which are common in the local region.



Figure 5 Cal Poly Humboldt Library Renovation



Figure 6 Cal Poly Humboldt Theater Arts renovation

Cal Poly Humboldt - Theater Arts Building: After the CSU Seismic Review Board classified the University's Theatre as a priority seismic retrofit project, the University embarked on a \$1,000,000 project in 2017 to upgrade the seismic elements required to mitigate the hazards. The work was completed in 2019 and provided additional steel bracing and strengthening of existing columns and shear walls. In addition, the scope included ADA accessible path of travel and restrooms upgrades as well.

Stanislaus State Library:

In 2022, Stanislaus State renovated and reopened the J. Burton Vasché Library; the original building of 127,000 SF was built in 1965. The \$58 million project included full seismic upgrades, new fire protection systems, new building interiors, exterior façade improvements and



Figure 7 Stanislaus State new library

state-of-the-art electronic compact book storage system. An opportunity that presented itself was structural up-grades to the roof; this structural work allowed for new openings on the second floor for daylight to filter down to the first floor from new clerestory windows.

California State University East Bay in 2019 seismically strengthened the 42,000 SF Library Annex (East) Building with braced frames along the perimeter of the east wing of the library. The installation also required column strengthening and foundation work. The budget of \$ 3,800,000 also included ADA improvements to correct accessibility deficiencies.



Figure 8 East Bay Library Annex