

Exhibit A

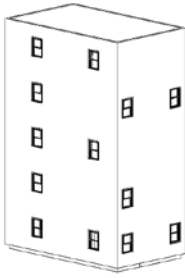


Fig. 1(a) - Exterior Sketch

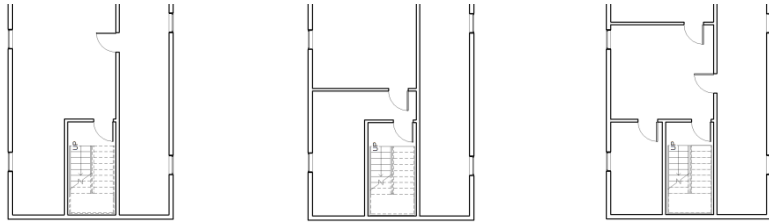


Fig. 1(b) Potential Interior Configurations

Post-Earthquake Fire Performance Issues: Under normal circumstances, fire protection of light-gauge cold-formed steel (CFS) framed structures is straightforward, and is typically achieved through proper installation of fire-rated gypsum wallboard on interior walls, and where required, appropriately fire-rated exterior wall systems. However, as demonstrated in the recent BNCS project, passive fire protection systems can be significantly damaged by differential seismic-induced movement of the structure. With respect to interior wall systems, a key concern is at wall-wall joints and wall-ceiling joints, where gaps can be created due to the movement of the building. If large enough, these gaps can allow for the dramatic spread of smoke and flame (see e.g. Fig. 2).

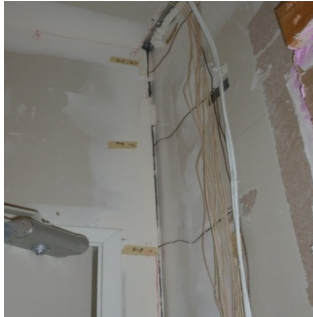


Fig. 2(a) 2.5 cm gap in wall-wall joint due to movement of building during seismic test



Fig. 2(b) Flame extension from room with test fire to adjacent room via gap at wall-wall joint



Fig. 2(c) Gap between exterior CFS framed wall system created due to ground motion and soot from smoke

In this same test series, significant damage was observed to the exterior balloon frame wall system, which was framed using CFS. In this situation, the exterior wall system separated from the floor system by as much as 5 cm along extended lengths. This loss of compartmentation resulted in vertical smoke and flame spread. The evidence of this can be seen in Fig 2(c), where the gap can be seen, along with soot residue from smoke which vented through the gap during the fire test phase. In addition to the passive fire protection systems, damage to active fire protection systems, such as sprinkler systems, can also occur during earthquakes, impacting the availability of automatic fire suppression within buildings. Furthermore, damage can occur to fuel gas piping, which could lead to additional fire hazards. Understanding the totality of potential sources of fire, and the performance of fire protection systems following earthquakes, is therefore extremely important.

Proposed Fire Test Program: To assess the post-earthquake performance of CFS framed multi-story construction, we propose to conduct 8 live fire tests in the specimen following the earthquake tests. Since the specimen is being designed with various fire-rated construction features, we will be able to assess earthquake performance of these systems to determine if gaps or other failures result, which would impact fire and life safety, and then use the live fire tests to assess the potential impact on fire spread. The test

Exhibit A

specimen will allow us to assess various fire mitigation measures, including various firestop materials and systems, and fire rated construction (walls, doors, ceilings). Active systems and water supply systems (sprinklers and standpipes) may be included, pending cost and time constraints. The specimen will be instrumented with thermocouples, smoke sensors, and cameras, with a focus on compartment temperatures, transmission of smoke and hot gasses through compartment barriers, and performance of egress systems. The fires will range from 0.5 MW to 5.0 MW, pending necessary approvals. The fires will be sized in each test to assess the potential for smoke spread, fire spread and local collapse.

Estimated Fire Test Budget and Timeline: The building components and systems will be provided and installed by UCSD's CFS-industry partner, as part of the earthquake test program, so there are no additional costs associated with preparing the base test specimen. The working budget for the fire test program is approximately \$100,000 (direct costs), which includes 10 days of UCSD LHPOST facility time to support sensor installation and testing on the shake table (\$21,000²), materials for fire testing (fuel, instrumentation, etc.) based on 8 fire tests (\$38,000), one month of salary and indirect cost for Professor Meacham and 2 student (or post-doc) researchers (\$36,000) and travel expenses (\$8000). **Of the CSSC, we are requesting support for the additional two weeks of shake table time support to facilitate these tests, i.e. (\$21,000 x 2 weeks + 17.5% assumed overhead = \$49,350).** We note that some in-kind support for experimental set-up and post-test analysis by Professor Meacham and students is anticipated from WPI. Time permitting, we will also solicit donation of water supply and sprinkler equipment in the form of in-kind donations from fire protection partners. Time on site will be limited to 10 days for fire testing: 4 days of sensor installation and calibration, 4 days of testing, and 2 days of sensor removal.

Key Activities	Dec 15	Jan 16	Feb 16	Mar 16	Apr 16	May 16	Jun 16
Fire funding requests							
Fire systems design							
Specimen Design & Construction							
Earthquake Testing							
Fire Testing							

² A nominal reduction in recharge rates is assumed, as the shake table will not be operated during the live fire tests.

State of California
Seismic Safety Commission

Memo

To: California Seismic Safety Commissioners

From: Seismic Safety Commission
1755 Creekside Oaks Drive, Suite 100
Sacramento, CA 95833
(916) 263-5506

Date: January 7, 2015

Subject: 2015 Annual Report

The attached 2015 Annual Report is in DRAFT format. This is the first DRAFT version. The final report will be presented at the *March 2016* Commission meeting for approval.

2015 Annual Report

California Seismic Safety Commission

Executive Summary

The Alfred E. Alquist Seismic Safety Commission (SSC) is the primary seismic resource for the State of California dedicated to reducing earthquake risk for the people of California since 1975. The Commission investigates earthquakes, reports on earthquake-related issues, and evaluates and recommends to the Governor and Legislature policies needed to reduce earthquake risk. Although the SSC does not have any governing authority on earthquake policy, the SSC strives to ensure a coordinated framework for establishing earthquake safety policies and programs in California.

Mission Statement

To provide decision makers and the general public with cost-effective recommendations to reduce earthquake losses and expedite recovery from damaging earthquakes.

Vision Statement

To provide leadership in implementing and achieving the goals and objectives in the *California Earthquake Loss Reduction Plan*, including to advance learning about earthquakes and risk reduction in both the short and long term, advance the earthquake-resistant designs of buildings and other important structures, and advance the preparedness and emergency response systems for earthquakes.

2015 Commission Membership

Timothy Strack, Chair	Fire Protection
Tracy Johnson, Vice Chair	Public Utilities
Senator Anthony Cannella	State Senate
Assembly Member Ken Cooley	State Assembly
Dr. Kit Miyamoto	Structural Engineering
Ian Parkinson	Emergency Services
Vacant	Vacant
Dr. Margaret Hellweg	Seismology
Helen Knudson	Social Services
Fuad Swiss	Mechanical Engineering
Dr. Gregory Beroza	Geology
Honorable Michael Gardner, Councilman Riverside	Local Government
David Rabbitt, Sonoma County Supervisor	Local Government
Mark Wheatley, Councilman, Arcata	Local Government
Vacant	Vacant
Randy Goodwin	Architectural and Building Official
Vacant, State Representative	Building Standards
	Commission
Mark Ghilarducci, State Representative	California Office of
	Emergency Services
Chester Widom, State Representative	State Architect
Vacant	Insurance

Commission Staff

Richard J. McCarthy, Executive Director
Robert Anderson, Senior Engineering Geologist
Sue Celli, Executive Secretary and Office Manager
Lena Daniel, Administrative Manager
Henry Reyes, Structural Engineer (Special Projects)
Fred Turner, Senior Structural Engineer
Salina Valencia, Legislative/ Communications Director

The SSC was established in 1975 to advise the Governor, Legislature, state and local agencies, and the public about strategies to reduce earthquake risk (Government Code §8870, et seq.). The SSC is under the State Business, Consumer Services and Housing Agency and consists of 20 commissioners. The Governor appoints 15 commissioners, chosen for their technical expertise and experience; the Senate and the Assembly each choose a representative from their respective memberships; and three state organizations are represented. The state representatives are the *California Office of Emergency Services, California Building Standards Commission, and the Division of the State Architect*. The SSC is supported by 6.5 staff members.

Commission Funding

The SSC is supported by the Insurance Fund managed by the California Department of Insurance. The SSC's operational budget for fiscal year (FY) 2015/2016 is #####. Occasionally, the Commission will receive reimbursement funds for special projects. For projects supported by the *California Earthquake Research Fund*, the Commission is entitled to charge a 10% overhead.

Commission 2015 Projects

Special Hearing on South Napa California (Post August 24, 2013 - 6.0 Earthquake) Emergency Response Recovery and Lessons Learned

The 2014 South Napa earthquake occurred in and around the city of Napa, California, on August 24 at 3:20 a.m. local time, measuring at 6.0 on the moment magnitude scale. The tremor's epicenter was located south of Napa, approximately 3.7 miles (6.0 km) northwest of American Canyon near the West Napa Fault, beneath the Napa Valley Marina on Milton Road, just west of the Napa County Airport.

This earthquake was the largest in the San Francisco Bay Area since the 1989 Loma Prieta earthquake. Significant damage and several fires were reported in the southern Napa Valley area, and there was also damage in the nearby city of Vallejo, in Solano County. The quake killed one person, injured about 200, and interrupted power to more than 69,000 Pacific Gas and Electric Company customers. An experimental earthquake warning system provided several seconds of warning to select Bay Area locations before the strong shaking arrived. A Presidential Disaster Declaration was announced on September 11, 2014. Early estimates by California officials indicated that the earthquake caused over \$400 million in damage, of which \$87 million may be eligible for federal reimbursement. Several dozen previously-retrofitted unreinforced masonry buildings experienced mixed performance, with a few suffering life-threatening damage.

In 2014 the Commission contracted with the Pacific Earthquake Engineering Research (PEER) Center to identify lessons learned from the August 2014 South Napa earthquake. PEER has completed a draft of the report and it is to be released to the Commission in January 2016.

Local Government Guidebook for Managing Risk of Collapse-Prone Buildings in California

California's 14 million buildings include some of the most modern and earthquake-resistant in the world. However, most older buildings could be damaged and a few – perhaps less than 5% - could collapse in severe shaking. This amount may seem small, but collapse can cause significant life loss, injuries and substantial social and economic disruption amounting to hundreds of billions of dollars.

The "Guide to Identify & Manage Seismic Risks of Collapse-Prone Buildings" summarizes California's laws and regulations to assist local governments to identify and reduce collapse risks, as well as best practices that building owners can take to further manage the risks.

At the October 2015 hearing, the SSC's ad hoc Committee on Collapse Prone Buildings presented a final draft of a 14-page executive summary. The ad hoc committee is chaired by Commissioner Randy Goodwin and includes Commissioners Kit Miyamoto and Fuad Sweiss. The Committee is currently focused on developing a draft companion appendix to the "Guide to Identify & Manage Seismic Risks of Collapse-Prone Buildings". A draft of the appendix will be handed out at the Commission hearing in January 2016. The draft appendix includes an introduction, a summary of the common types of buildings that are prone to collapse, the most effective methods of managing this risk, a section on who is responsible for managing the risks, checklists of typical tasks for inventorying and evaluating buildings, sample form letters, and reference materials.

California Earthquake Early Warning Benefit Analysis Report

The California Office of Emergency Services (CalOES) was tasked with leading a comprehensive effort to bring together experts, scientific members of government and private industry, to secure an effective and reliable Earthquake Early Warning System (EWS) in California.

In September 2013, Governor Jerry Brown signed Senate Bill 135 into law. This was a critical step forward in the overall effort to provide Californians with enough warning that an earthquake capable of producing intense ground shaking has occurred.

SB 135 requires that the CalOES will, in collaboration with the California Institute of Technology (Caltech), the California Geological Survey (CGS), the University of California (UC Berkeley), the United States Geological Survey (USGS), the SSC and other stakeholders, develop a comprehensive statewide EWS through a public/private partnership.

The SSC is part of the "California Office of Emergency Services Earthquake Early Warning Working Group." This partnership is dedicated to develop a needs-driven, user-driven California Early Earthquake Warning System (CEEWS). The working group completed a charter in 2014 to serve as a road map to developing a working system.

CalOES has agreed to pursue a phased approach to a Benefit Analysis of CEEWS. The SSC will fund phase-one of the Benefit Analysis. Per the request of CalOES in partnership with the SSC the Pacific Earthquake Engineering Research (PEER) Center will be conducting research and study to prepare a business case for EWS. PEER is a multi-institutional research & education center. The PEER study will provide an objective analysis to assess and validate the potential benefits of an EWS. The objective is to establish the system's value to the business community and key sectors in order to promote public and employee safety, enhance business resiliency, and protect infrastructure critical to local communities and the economy. This project is an initial step toward what will be a more comprehensive analysis over time and as the system is developed.

**Senate Bill 1345: Seven Year Extension of Seismic Safety Commission Review of San Francisco
Public Utilities Water Delivery System Retrofit Project**

SB 1345 extends the Commission's oversight of the public safety implications of delays and project deletions during the San Francisco Public Utilities' Commission's (SFPUC) efforts to retrofit and replace major portions of the Hetch Hetchy Regional Water Transmission System to the Bay Area.

The Wholesale Regional Water System Security and Reliability Act required the City and County of San Francisco to adopt a specified program of capital improvement projects designed to restore and improve the Bay Area regional water system. Within 90 days of receiving changes to the program or postponements of the scheduled completion dates, the Seismic Safety Commission and the State Department of Public Health are to submit to the SFPUC and the Joint Legislative Audit Committee written comments with regard to the significance of the change with respect to public health and safety. Existing law makes the act inoperative and repeals these provisions on January 1, 2015.

SB 1345 extends the time the Seismic Safety Commission and the State Department of Public Health have to submit the written comments to 120 days and would extend the repeal date of the act to January 1, 2022. By extending the period of time during which certain requirements would apply to regional wholesale water suppliers and the City and County of San Francisco, the bill will impose a state-mandated local program.

The latest delays to five seismic safety-related projects do not appear to adversely impact the program's overall completion date. All of the delayed projects will have substantially completed their construction and will be operable prior to March 2016 when the SSC is required to submit a review. The delays have reportedly been caused by minor items during the final phases of the projects, including late change order requests and litigation claims from contractors that the SFPUC staff is processing.

Hospital Safety Board Annual Report To Commission

Government Code Section 8870.95 requires the Hospital Building Safety Board to report annually to the Alfred E. Alquist Seismic Safety Commission.

This year's budget required the Department of State Hospitals to consult with the SSC while Department State Hospitals (DSH) summarized known information about the level of seismic safety of its state-owned hospital buildings by January 10, 2016. A rough draft "Report on the Seismic Safety of the State Hospitals" was issued by DSH on October 9, 2015. The SSC staff offered recommendations for changes to the draft. Second and third drafts were released in late

JPL-developed technology and capabilities that may assist in reducing earthquake hazard and improving earthquake resiliency and other natural disaster within California.

Guide to Identify & Manage Seismic Risks of Buildings for Local Governments

At the October hearing, the Commission’s Committee on Collapse Prone Buildings presented a final draft of a 14-page executive summary. The committee is chaired by Commissioner Randy Goodwin and includes Commissioners Kit Miyamoto and Fuad Sweiss. Since October, the Committee has focused on developing a draft of a companion appendix. A draft of the appendix will be handed out at the Commission hearing in January 2016. It includes an introduction, a summary of the common types of buildings that are prone to collapse, the most effective methods of managing this risk, a section on who is responsible for managing the risks, checklists of typical tasks for inventorying and evaluating buildings, sample form letters, and reference materials.

Commission Budget Summary

Budget Year 2015/2016

Staff	California Insurance Fund
6.5	