

REPORT TO CALIFORNIA SEISMIC SAFETY COMMISSION

SEISMIC MITIGATION PROGRAM

PRESENTED BY

OFFICE OF PUBLIC SCHOOL CONSTRUCTION

MEETING DATE: MAY 12, 2011

INDEX

Title Page	i
Index	ii
<u>Report</u>	
Executive Summary	1
Seismic Mitigation Program Background	1
The State Allocation Board	2
The Office of Public School Construction	2
Seismic Evaluation Grant and Contracts	2
Seismic Evaluation Contractors	2-3
Most Vulnerable Category 2 Buildings	3-4
Seismic Evaluation Template	4
Participating and Non-Participating School Districts	5
Current Status of Seismic Evaluation Contracts	5-6
Repair Cost Estimates	6
OPSC's Total Cost Projection	6
Retention of Grant Funds	7
Status of SMP and Future Program	7
A Note to the Commission	8
<u>Attachments</u>	
List of Evaluated School Buildings	A
Seismic Evaluation Template	B
DGS Funding Augmentation Request Letter	C

EXECUTIVE SUMMARY

Funding authorized by the voters in 2006 to address the most serious public school seismic issues has been accessed by three school districts with four projects to date. Stakeholders have cited the costs of hiring an engineering firm with no guarantee of funding as a major impediment to moving forward in assessing risks associated with their seismic projects. To that end, the California Seismic Safety Commission (CSSC) provided to the Office of Public School Construction (OPSC) and the State Allocation Board (SAB) a \$200,000 grant to contract for structural engineering services. The goal is to facilitate seismic risk assessments of previously identified school buildings and to jumpstart the identification and processing of more seismic projects. The contracted services required the development of a seismic evaluation report template and site evaluations at California public K-12 schools.

Of the 16 school districts in California with preliminarily qualified buildings, nine school districts, containing 38 identified buildings, chose to participate in this seismic assessment program. To date, the seismic evaluation report template has been successfully used by structural engineers in the inspection and reporting process of all 38 preliminarily qualified school buildings, thus successfully completing the contracts. As a result of these reviews, 21 facilities, in six school districts, are eligible for State seismic funding. More information associated with specific school districts involved in the seismic reviews and the structural engineering contracts is provided in this report.

SEISMIC MITIGATION PROGRAM BACKGROUND

Proposition 1D, approved by California voters in November, 2006, provided \$199.5 million in grant funds for Seismic Mitigation Program (SMP) construction projects determined to have "most vulnerable California school facilities" status. These grant funds are provided to repair, reconstruct, or replace the "most vulnerable" school facilities. (Please see the definition of "Most Vulnerable Category 2 Buildings" on page three). To date, three school districts have received approximately \$19.0 million in SMP funding or funding application approvals. To be eligible for SMP funding, school facilities must meet certain criteria and pose an unacceptable risk of injury to their occupants in the event of a seismic occurrence. As a result of Proposition 1D, the SAB approved amendments to the School Facility Program (SFP) regulations to implement the SMP.

A school district is eligible for Proposition 1D grant funding to replace or rehabilitate new school facilities if the school district can demonstrate to the SAB that the health and safety of the pupils is at risk. For a school district to receive seismic mitigation funding the district must: 1) have a building classified as a Most Vulnerable Category 2 Building* as verified the Division of the State Architect (DSA), and 2) be in a location with a spectral response acceleration rating that equals or exceeds 1.68g. If all other determining criteria listed in this report are met, the applicant school district qualifies for SMP Facility Hardship funding.

* For more information on the SMP and Most Vulnerable Category 2 Buildings see SFP regulation sections 1859.82 and 1859.2.

THE STATE ALLOCATION BOARD

The SAB is responsible for determining the allocation of State resources, including proposition 1D funds for seismic mitigation of public school facilities. The SAB is charged with the responsibility for setting policy direction in administration of the SFP. The SAB is the policy level body for the programs administered by the OPSC.

THE OFFICE OF PUBLIC SCHOOL CONSTRUCTION

The OPSC, as staff to the SAB, implements and administers the SFP and other programs of the SAB. It is incumbent on OPSC staff to apply regulations, policies and procedures which carry out the mandates of the SAB and to work directly with school districts throughout the grant application and funding process. The OPSC is responsible for ensuring that grant funds are disbursed properly and in accordance with the decisions made by the SAB. The OPSC must verify that all applicant school districts meet specific qualifying criteria based on the type of funding requested. For SMP funding, both the OPSC and DSA verify that applicants meet the eligibility criteria for the program.

SEISMIC EVALUATION GRANT AND CONTRACTS

In November 2009, the CSSC provided OPSC a \$200,000 grant to contract for structural engineering services to conduct evaluations at public K-12 school sites preliminarily identified by DSA. The resulting evaluations identified K-12 school buildings that may be at risk during a seismic event. In addition, the contracts were designed to develop a seismic evaluation report template which provides a more systematic and cost effective approach for determining the seismic safety of school facilities.

The template and accompanying structural engineer evaluation reports are an integral part of the application process to determine qualification for SMP funding. Specifically, the seismic evaluation reports provide applicant school districts the documented information and analysis to qualify for SMP funding.

SEISMIC EVALUATION CONTRACTORS

Using the grant funds provided by the CSSC, the OPSC, through the competitive bidding process, awarded two California engineering firms contracts to assist the OPSC and DSA in the development of a standardized seismic evaluation report template (template) and to perform seismic evaluations of preliminarily identified K-12 school facilities.

The two contractors selected for the project, ZFA Structural Engineers (representing Northern California) and ABS Consulting (representing Southern California). They worked as a team, along with OPSC and DSA staff, to develop the template for a focused application of **ASCE 31** Tier 2 evaluation procedures.

This template (see attachment "B" – rev. 04/01/11) was successfully used for seismic structural evaluations of preliminarily identified school facilities that appeared to qualify as Most Vulnerable Category 2 buildings. The template provided a standardized procedure for evaluating the structural risk of facilities, which resulted in rapid seismic evaluations at minimal cost. The contractors performed on-site seismic structural evaluations of the preliminarily identified buildings at each participating school district (see page 5). The contractors' reports consisted of two parts, the completed Seismic Evaluation Template Report and the Structural Engineers' Report.

Most Vulnerable Category 2 Buildings

A school district is eligible for SMP Facility Hardship funding to replace or rehabilitate school facilities, if the district demonstrates, to the satisfaction of the SAB, that the condition of the respective school facilities is a threat to the health and safety of the students. Factors to be considered by the SAB shall include, but are not limited to, seismic mitigation of the Most Vulnerable Category 2 facilities that are in locations with a spectral "g" force response acceleration rating equal to or exceeding 1.68, as verified by the DSA.

There are four main eligibility requirements to qualify for Seismic Mitigation Facility Hardship funding under the definition of Most Vulnerable Category 2 Buildings. As defined by the DSA, Most Vulnerable Category 2 Buildings means:

- The building is located in an area where the short period spectral response acceleration equals or exceeds 1.68g based on the 2002 United States Geological Survey National Seismic Hazard Maps adjusted for site class factors.
- The building is designed for occupancy by students and staff.
- The building qualifies as one of the following structural types stipulated:
 1. C1 – Concrete Moment Frame,
 2. C1B – Reinforced Concrete Cantilever Columns with Wood Roofs,
 3. PC1 – Precast/Tilt-up Concrete Shear Wall with Concrete Floor and Roof Diaphragms,
 4. PC1A – Precast/Tilt-up Concrete Shear Wall with Flexible Roof,
 5. PC2A – Precast Concrete Frame without Concrete Shear Walls and with Rigid Floor and Roof Diaphragms,
 6. PC2 – Precast Concrete Frame and Roofs with Concrete Shear Walls,
 7. C3A – Concrete Frame with Infill Masonry Shear Wall and Flexible Floor and Roof Diaphragms,
 8. URM – Unreinforced Masonry Bearing Wall Buildings.

(Continued on Page 4)

- A structural report is provided by a structural engineer that details: 1) the lateral force-resisting system of the building, which does not meet collapse prevention performance objectives, 2) the specific deficiencies, and 3) the reason(s) for concluding that the building has a potential for catastrophic collapse.

SEISMIC EVALUATION TEMPLATE

The template was used for Seismic Structural Evaluations of preliminarily identified public school facilities that appeared to qualify as the Most Vulnerable Category 2 buildings. The template, as intended, ensures complete and consistent seismic evaluation reports. The template was also designed to quickly and effectively address the first three eligibility requirements (bullet points listed on page three) using questions that require only yes/no answers.

The fourth eligibility requirement (fourth bullet point) identifies critical deficiencies in the design and construction of the building that could contribute to local or global collapse if the building is subjected to the threshold 1.68g force acceleration or greater.

As previously stated, one of the goals of the template development was to reduce the cost of the seismic safety evaluation. If critical building deficiencies are quickly identified, the cost of providing a more detailed evaluation (see mitigation plan below) will not be needed and the evaluation can be halted.

The DSA, upon receipt of the completed template and accompanying structural engineers' report, verifies the information provided. The DSA reviews the identified critical deficiencies and the structural engineer's justification that there is a potential for collapse in the event of an earthquake. If the DSA concurs with the engineer's description of the critical deficiencies, the DSA will send a letter to the school district, the structural engineer, and the OPSC that states the building meets the eligibility requirements for SMP funding.

The letter also informs the school district that to continue the funding process for seismic replacement/rehabilitation under the SFP, the school district must submit its mitigation plan to DSA. This mitigation plan must be accompanied by detailed project cost estimates. These project cost estimates, once approved by DSA, allow the OPSC to calculate the estimated grant amounts for each SMP grant application.

If the template and structural engineer report information cannot be verified by the DSA, the report will be rejected and a disapproval letter will be sent to the school district, the structural engineer, and the OPSC. If a building does not meet all eligibility requirements, the DSA will send a disapproval letter to the parties involved.

PARTICIPATING and NON-PARTICIPATING SCHOOL DISTRICTS

Of the 16 school districts in California with preliminarily qualified buildings, nine school districts chose to participate in this evaluation process. These participating districts are listed below along with their County of location:

<u>District</u>	<u>County</u>
Aromas-San Juan	San Benito
Fillmore Unified	Ventura
Fortuna Union High	Humboldt
Hemet Unified	Riverside
Redlands Unified	San Bernardino
Oakland Unified	Alameda
San Bernardino City Unified	San Bernardino
William S. Hart Union	Los Angeles
Santa Paula Elementary	Ventura

These nine school districts contain 38 buildings that were preliminarily identified by DSA as potentially meeting the qualification standards.

There are seven school districts with preliminarily identified school facilities, containing a total of ten buildings, which did not participate in this evaluation program. Three school districts, including Piedmont City Unified School District (USD), San Ramon Valley USD, and West Contra Costa USD, containing a total of four buildings, have either received or are approved to receive SMP funding to rehabilitate or replace their SMP qualified buildings. Two school districts, Hayward USD and Jefferson Elementary School District of San Mateo County, containing a total of three buildings, do not currently have the required district matching funds for a SMP rehabilitation project as required by the grant programs. Alameda County Office of Education reported that their one identified building is being sold. Los Angeles USD is working closely with DSA and OPSC on seismic issues for their two identified buildings.

CURRENT STATUS OF SEISMIC EVALUATION CONTRACTS

As of May 12, 2011, all nine participating school districts have received site visits from the contractors and all seismic evaluation reports have been received by OPSC and DSA, completing the original review process. Of the preliminarily qualified school buildings, 21 out of 38, have met all qualification standards while 17 school buildings have not. The 17 school buildings that didn't qualify are not one of the pre-determined structural types listed in SFP regulation. For more information, see the detailed list of evaluated buildings, including inspection results, provided in attachment "A" of this report.

Below is a listing of each participating school district (SD), the site review and report preparation costs, and the structural engineers' repair/rehabilitation construction cost estimates.

District	Review/Rpt Cost	Repair Estimates
Aromas-San Juan SD	\$16,837	\$900,000-\$1,800,000
Fillmore Unified SD	11,035	not qualified
Fortuna Union High SD	9,300	1,000,000-3,000,000
Hemet Unified SD	16,143	895,000-1,370,000
Redlands Unified SD	6,270	not qualified
Oakland Unified SD	26,070	3,600,000-7,200,000
San Bernardino City Unified	11,010	not qualified
William S. Hart Union SD	5,715	350,000-550,000
Santa Paula Elementary SD	12,853	10,000,000-15,000,000
Template Development	7,420	NA
 Total Costs	 \$122,653	 \$16.7 to \$28.9 million

REPAIR COST ESTIMATES

As indicated in the above chart, the structural engineers' repair estimates range from \$16.7 to \$28.9 million. Estimates are significantly higher than the last report due to reclassification of one of Santa Paula Elementary School District's building. These estimates are not inclusive of all costs that will be realized by the State (see OPSC's Total Cost Projection below). As stated by one structural engineer, "a rough opinion of the cost range to design and install mitigation measures for these identified deficiencies is difficult to develop without further analysis and investigation, which is beyond the scope of this evaluation." Therefore, the cost estimates, which were included in the reports, are not to be considered an accurate or complete estimate of mitigation costs.

OPSC's TOTAL COST PROJECTION

The OPSC has estimated that the State share of replacement/rehabilitation costs for the 21 identified buildings could be approximately \$76.2 million if all six school districts request SMP grant funding for all 21 identified buildings. These cost estimates were derived by using OPSC's construction cost index formulas for SMP replacement projects.

RETENTION OF FUNDS

At the March 10, 2011 CSSC meeting, OPSC requested approval from the CSSC to retain the unencumbered funds that will allow OPSC to contact to those school districts that chose not to participate in the seismic evaluation program and allow those districts a "second chance" to participate in both identifying and assessing seismic risk potential. The unencumbered funds are currently \$77,347. This request was approved by the CSSC.

As stated with the original request, retention of unencumbered funds will also be useful in the event of possible prospective revisions to SMP eligibility requirements. These seismic reviews indicate the total projected repair/replacement cost of all qualified buildings to be significantly less than the \$180.5 million in bond funds remaining in the SMP. The remaining contractual funds could then be used to provide future seismic engineering evaluations for requesting school districts.

Additionally, on April 27, 2011 the Department of General Services (DGS) submitted a request letter (see attachment "C") to CSSC for an additional \$50,000 to augment the remaining unencumbered funds. With SMP changes coming in the near future (see Status of SMP and Future Program below) the DGS is concerned that the remaining unencumbered funds may be insufficient to meet expanded demand for seismic engineering and template service requests from school districts. To facilitate the additional seismic evaluations, the OPSC has extended ABS Consulting's contract until December 31, 2011. ABS Consulting has proven to be the most cost efficient contractor. It is estimated that up to 45 seismic evaluations could be completed if the additional funding augmentation request is granted by CSSC.

STATUS OF SMP AND FUTURE PROGRAM

In March 2011, the OPSC hosted an inter-departmental Seismic Program Review Workshop to assess the scope and effectiveness of seismic building evaluations and review how State agencies currently review, evaluate, and assess seismic risk. The OPSC presented a report to the SAB as well, which included the CSSC grant funded seismic evaluations, creation of the seismic evaluation template, status of approved and pending SMP projects, and potential impact on bond authority of the SMP eligible buildings. As a result of the March report, the SAB established the Seismic Mitigation Subcommittee (committee). The Committee met twice to discuss proposed program amendments in order to increase participation in the SMP through revisions of the standards required for districts to access funds for projects. An additional meeting is set for May 18, 2011. Options to be considered by the Committee meeting in May include: 1) incrementally lowering the short period spectral response acceleration threshold to enable more buildings to qualify for SMP funds, 2) allowing incremental seismic mitigation improvements to address identified structural deficiencies without triggering comprehensive code upgrades, and 3) allowing structural engineers to certify, along with DSA's concurrence, that a school building is at risk and therefore qualified for SMP funding.

(Continued on Page 8)

A NOTE TO THE COMMISSION

The OPSC wishes to express its heartfelt thanks and appreciation to the California Seismic Safety Commission for not only providing the seismic template and engineering assessment funding to assist school districts in assessing their school facilities that may be at risk, but also for helping to bring to the forefront the issues and challenges facing the SMP. As previously discussed, the grant funding has facilitated the identification of 21 additional SMP projects. Once these projects are completed, these school districts will benefit by having safer and more secure learning environments for California's school children.