ASHSC Alaska Seismic Hazards Safety Commission

POLICY RECOMMENDATION 2015-2

IDENTIFICATION AND PRIORITIZING MITIGATION OF SEISMICALLY VULNERABLE SCHOOL BUILDINGS

(ADOPTED 11 MAY 2015)

Alaskans should expect that their children attend schools that are resistant to damaging earthquake hazards, such as strong shaking, ground failure, and tsunami inundation. Further, many school facilities in Alaska are also used as community gathering places and as emergency shelters in times of natural disaster. Therefore, the Alaska Seismic Hazards Safety Commission recommends that the State support and appropriate resources for programs that identify and prioritize rehabilitation or replacement of those school facilities most at risk from earthquakes, to mitigate risk to our children, and to assure those facilities can be used as emergency shelters in times of need.

This policy recommendation expands upon elements addressed in the Western States Seismic Policy Council[a] (WSSPC) Policy Recommendation 13-10[1], and the position of the Cascadia Region Earthquake Workgroup (CREW), regarding the earthquake safety of schools [2].

INTRODUCTION

Alaska has more earthquakes than any other region of the United States and is, in fact, one of the most seismically active areas of the world; with a potential across the entire state for earthquakes strong enough to damage local buildings. It is without question that the citizens of Alaska should expect that our children are attending school in buildings that are resistant to damaging earthquake hazards such as strong shaking, ground failure, and tsunami inundation. Furthermore, Alaskan schools frequently are the most heavily occupied and presumed safest structures in a community; supporting students on a daily basis throughout the school year, serving the public in various capacities with after school activities, and functioning as designated emergency shelters in the case of a natural disaster.

However, despite the active seismic setting and potential for damaging earthquakes, the State does not have an established program(s) or policy to actively identify the vulnerability of existing schools to damaging earthquake hazards, or to prioritize rehabilitation or replacement of those school facilities most at risk from earthquakes.

METHODS

There are several methodologies routinely used to efficiently, economically, and rapidly screen and rank the vulnerability of a structure to damage during a codified design-level earthquakes, based on building age, type of structural and foundation, and local geologic conditions. The most common of these screening methods include FEMA's *Rapid Visual Screening of Buildings* [3], ASCE/SEI's *Seismic Evaluation of Existing Buildings - Tier I Screening* [4] and FEMA's

[a] *The Alaska Division of Homeland Security & Emergency Management, Alaska Division of Geologic & Geophysical Survey, and the Alaska Seismic Hazards Safety Commission are members of WSSPC*

Reducing the Risks of Nonstructural Earthquake Damage [5]. All of these methods can be used as the basis for identifying, at very little cost, effort or time, which facilities are most likely prone to major damage or collapse in the event of a strong earthquake.

It is important to understand that the above screening methods simply qualify the vulnerability of an existing building to damage during a codified design earthquake; but are not sufficient to determine the full scope of rehabilitation that could be required. Therefore, more detailed evaluations would be required for the schools that are found to be most at risk. However, the results from a program using the above rapid and inexpensive screening methods would provide a logical and validated approach to directing funds towards those school buildings most at risk.

These methodologies to review the vulnerability of school facilities described above have been successfully used in other states and countries with high-seismic risk, and have been recently used in the Mat-Su school district. States with the greatest success using this methodology are Washington, Oregon, California and Utah. These states are members of the Western States Seismic Policy Council (WSSPC), which develop and provide information intended to reduce earthquake related losses.

CONCLUSION

The Commission firmly believes that children, teachers and parents have the right to be safe in school buildings during earthquakes. These facilities will be heavily dependent to shelter Alaska's vulnerable populations from harsh climate following a severe seismic event. Therefore, the Commission recommends that the State Legislature and Alaska Department of Education and Early Development (ADEED) establish and implement a program(s) identifying schools that may be vulnerable to seismic hazards and pose a potential life safety threat to their occupants. The Commission further suggests that structural and non-structural elements be evaluated, since both can result in injuries or death in the event of a damaging earthquake. Evaluation for potential tsunami inundation, earthquake-induced ground failure below foundations, and local landslide effects also should be considered during the process. Such information will help prioritize funding for projects that will improve the safety and resiliency of existing schools throughout Alaska.

REFERENCES

[1] Western States Seismic Policy Council (WSSPC), Policy Recommendation 13-10, Joint Policy for the Evaluation and Seismic Remediation of School Buildings.

[2] Cascadia Region Earthquake Workgroup (CREW), Position Statement on Earthquake Safety and Schools in the Cascadia Region (adopted February 2013).

[3] Federal Emergency Management Agency (FEMA). Rapid Visual Screening of Buildings for Potential Seismic Hazards: A handbook. (FEMA 154 or P154)

[4] American Society of Civil Engineers (ASCE). Seismic Evaluation and Retrofit of Existing Buildings. (ASCE/SEI 41-13).

[5] Federal Emergency Management Agency (FEMA). Reducing the Risks of Nonstructural Earthquake Damage – A Practical Guide (FEMA E-74)