



POLICY RECOMMENDATION 2015-1

SEISMIC RISK MITIGATION OF FUTURE DESIGN, CONSTRUCTION, AND MAJOR RENOVATION OF ALASKA SCHOOLS (ADOPTED 21 APRIL 2015)

Ensuring that proposed new schools are designed and constructed in accordance with the seismic provisions of the International Building Code (IBC) adopted by the State^[1] is critical to the safety of the users of these facilities. In addition, a facility undergoing a major renovation or expansion should also meet the current seismic provisions of the IBC. Therefore the Alaska Seismic Hazards Safety Commission (ASHSC) recommends that the State of Alaska, through the Alaska Department of Education and Early Development (ADEED), develop requirements specific to the seismic review, design, and construction of school facilities. Policy Recommendation 2015-1 expands upon elements addressed in the Western States Seismic Policy Council^a (WSSPC) Policy Recommendation 13-7^[2].

INTRODUCTION

In 2009, following recommendations submitted by the ASHSC, the ADEED revised their *Application for Funding*^[3] to include a cost line item relating to “seismic hazard mitigation of a school facility”. A school district now has the opportunity to include seismic design upgrades as a part of any major maintenance or renovation funding request.

The successful use of this provision is contingent upon the respective school district’s ability to identify seismic upgrade requirements. However, the State of Alaska (i.e. the ADEED, Department of Safety {Division of Fire Safety}, or Department of Transportation and Public Facilities) does not currently have explicit written provisions, procedures or policies for new school facility design, construction or major renovations that require:

1. Design by a professional experienced in seismic resistant design,
2. Submission of plans and specifications for review by an *independent* reviewer experienced in seismic design, or
3. Periodic inspection of the as-constructed seismic resistance elements by a qualified inspector.

The following background lends support to ASHSC Policy Recommendation 2015-1, and presents justification for the development of procedures to specifically address seismic design and construction requirements for new school facilities and major renovations.

^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

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BACKGROUND

In 1933, an earthquake in Long Beach, California demonstrated the vulnerability of school buildings. Schools suffered catastrophic damage throughout the Los Angeles area. It was reported that 300 schools noted minor damage, 120 reported major damage, and 70 facilities collapsed. The California Legislature took immediate action by implementing The Field Act^[4] which established stringent requirements for design, review, and construction inspection of new school facilities. Since the implementation of The Field Act in California, new school construction has fared well during major earthquakes in 1971 (San Fernando), 1989 (Loma Prieta), and 2004 (Northridge).

During the 1964 Great Alaska Earthquake, Anchorage experienced two major failures of school facilities: Government Hill Elementary School was damaged beyond repair and Anchorage High School had extensive damage but was repaired and subsequently reoccupied. In the recent past, inadequate lateral resistance of as-constructed elements was noted upon examination of a gymnasium roof structure failure in Aleknagik, Alaska and seismic design errors were inadvertently discovered prior to construction of a middle school in Eagle River, Alaska. Implementation of procedures suggested in ASHSC Policy Recommendation 2015-1 could have mitigated damage during the 1964 Great Alaska Earthquake and could have eliminated the more recent Eagle River and Aleknagik school problems.

CONCLUSION

Many Alaskan schools are located in areas of risk from a major earthquake. These facilities house students during the day, are community activity centers during the evening, and some are also designated for emergency evacuation shelters in the event of a disaster, including flooding, wind as well as earthquakes. The ASHSC therefore recommends that the State of Alaska, in concert with the ADEED, develop explicit written procedures addressing the experience of engineers performing the seismic design, independent review of the seismic design, and special construction inspection of the seismic resistance elements for new school facilities and major school renovations.

References

- ^[1] Alaska Administrative Code, Title 13, Chapters 50 through 55, effective November 2012.
- ^[2] Western States Seismic Policy Council (WSSPC), Policy Recommendation 13-7 Seismic Design of New School Facilities
- ^[3] Alaska Department of Education and Early Development (ADEED), Application for Funding, Capital Improvement Project by Grant or State Aid for Debt Retirement, FY2014.
- ^[4] The Field Act-History and Issues for California Schools, Daniel Barclay, 17 September 2002.