STATE OF ALASKA

SEAN PARNELL, GOVERNOR

SEISMIC HAZARDS SAFETY COMMISSION

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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TO: Sam S. Kito III, P.E., Facilities Engineer
Alaska Department of Education and Early Development
Division of School Finance/Facilities

FROM: John Aho, Ph.D., Sc.D., Chair,
Alaska Seismic Hazards Safety Commission

SUBJECT: Recommendation for Evaluating Existing Public Schools for Seismic Safety

Recommendation

In addition to supporting students on a daily basis throughout the school year, most Alaskan schools also serve the public in various capacities after school hours and many are designated as emergency shelters in the case of a natural disaster. Therefore, the Alaska Seismic Hazards Safety Commission (ASHSC) recommends that the Alaska Department of Education and Early Development (ADEED) establish an active program to begin the process of identifying schools that may be vulnerable to seismic hazards and pose a potential life safety threat to their occupants. The ASHSC further suggests that structural and non-structural elements be evaluated since both can result in injuries or death. Evaluation for potential tsunami inundation, earthquake-induced ground failure below foundations, and local landslide effects also should be considered during the process.

Because of the expense of such an undertaking, the ASHSC suggests first prioritizing schools located in areas of potentially strongest earthquake ground shaking identified on United States Geological Survey (USGS) maps of Alaska, and then further ranking those schools by conducting preliminary screening. The at-risk schools would then be addressed in ranked order with the most vulnerable facilities being examined first.

Prioritization

Screening and ranking schools based on age, structural and foundation conditions, and seismic/site hazards prior to conducting detailed structural analysis is common practice, and is discussed below. However, the cost to screen every school in the State could prove prohibitive if conducted as a single project. The ASHSC suggests prioritizing the screening of schools by regions of highest seismicity, first. This can be done using the most current version of Maximum Considered Ground Motion maps for Alaska, as published in the International Building Code, the American Society of Civil Engineers (ASCE/SEI 7-05), and the USGS.

To further assist the ADEED, the ASHSC has identified Alaska public school buildings located in the areas of highest seismicity, as depicted on the attached map and table. The ASHSC recommends that the map and table be used along with other building information to establish budget priorities and select schools for seismic-safety evaluation. By ranking

schools by location in areas of highest ground motions, age and construction type of the facility, a sound basis can be established for evaluation along with a goal to further screen "X number" of buildings per year to determine whether seismic upgrade is needed.

Implementation of Formal Screening Methodology

Once schools are prioritized, other more detailed and professionally accepted screening methodologies for preliminarily identifying at-risk structures could be utilized, such as FEMA's ***Rapid Visual Screening of Buildings***, ASCE/SEI's ***Seismic Evaluation of Existing Buildings- Tier I Screening,*** and FEMA's ***Reducing the Risks of Nonstructural Earthquake Damage.*** These methods can be used as the basis for identifying which facilities are most likely prone to major damage or collapse in the event of strong ground-shaking.

The screenings will require follow-up with detailed evaluations, including the verification of existing site and structural conditions. Preliminary screening, however, helps prevent spending money to analyze structures that in all probability meet life-safety requirements. It also enables the ranking of the structures by the highest probability of significant structural and/or non-structural damage. It should also be noted that some districts may have already conducted seismic-safety screening of their facilities, in which case existing information could be used.

ATTACHMENTS:
Map – Public Schools and Earthquake Risk in Alaska
Table – Alaska Public Schools Sorted by Probabilistic Peak Ground Accelerations

CC: Ester Cox, Chair, State Board of Education
Alaska Department of Education and Early Development
Larry LeDoux, Commissioner
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