Why Are Schools at Risk?

For the Pacific Northwest, the biggest earthquake hazard is the Cascadia subduction zone, which is expected to produce a magnitude 9.0 earthquake and tsunami causing widespread damage. Other fault zones may trigger earthquakes that inflict additional severe damage locally. Many schools were built before the extent of these hazards was known and before modern seismic/earthquake design standards and building codes were adopted. These older schools are more likely to suffer damage or fail in an earthquake.

Growing awareness of the Pacific Northwest’s earthquake hazard has prompted many communities to work toward making school buildings safer and more resilient. While the region is making progress, many schools are not yet ready for the next earthquake.

Are Schools Ready for the Next Big Quake?

Major earthquakes around the globe often result in deaths and injuries in schools. Luckily, U.S. and Canadian schools have seen few such casualties because schools happened to be unoccupied when damaging earthquakes struck. There is still a great risk because of the safety measures in school buildings.

Preparing Schools for Earthquakes
Why Earthquake Safety is Critical

In this fact sheet:

- Why many schools in the Pacific Northwest are vulnerable
- Why earthquake safety matters
- What school districts and communities can do to improve earthquake safety and resilience

Retrofitting an old building or constructing a new one to meet stricter earthquake design standards can:

- Keep students, teachers, and staff safe in an earthquake.
- Reduce the cost of repairs after an earthquake.
- Reduce the number of buildings that school districts will have to demolish and rebuild after an earthquake.
- Reduce the post-earthquake disruption and recovery time for the whole community.

Some building types, such as unreinforced masonry (URM), are prone to collapse. Certain structural features that are common in schools can also make buildings less stable, such as rows of large windows along main floors and big interior spaces with minimal internal bracing.

Even in newer buildings, unsecured nonstructural elements (including light fixtures, air ducts, and parapets) and furnishings may fall, blocking exits and causing injuries and damage. —Learn more on p. 2

Light fixtures fell at Dawson Elementary School in Coalinga, CA, during a M 6.4 earthquake in 1983.
Did You Know?

All modern school buildings must meet the minimum *life-safety* seismic standard: This means a building may be damaged beyond repair in an earthquake, but it will not collapse and everyone can exit safely. If a school serves as an emergency shelter after an earthquake, the building must meet a higher seismic design standard, making it safe for immediate occupancy.

Why Earthquake Safety Matters

Children attending public or private schools have a right to expect safe buildings. Schools are also essential to a community’s post-earthquake recovery: well-prepared schools can resume operations more quickly after an event, which allow students to return to class, parents to return to work, and restoration of stability.

The benefits of upgrading buildings are clear: After the Canterbury earthquakes in 2010–11, New Zealand’s Ministry of Education assessed school buildings. Although 153 were damaged, the report concluded that earthquake upgrades, which the ministry completed before the earthquakes struck, effectively strengthened buildings, prevented collapse and kept students and teachers safe.

Get Ready: Take Steps Now toward Safer Schools

- Identify hazards that could impact the site and buildings; create and update emergency plans and supplies; and educate staff, students, and families so everyone knows what to do.
- Practice earthquake drills and evacuation procedures regularly.
- Use ASCE/SEI 41-13 (available at www.asce.org) or equivalent evaluation standards to assess buildings in quake-prone areas.
- Prioritize vulnerabilities that impact life safety and develop a mitigation plan based on benefit/cost analysis of the options; consider all potential uses of the building.

Featured Links

National Clearinghouse for Educational Facilities: www.ncef.org/content/earthquakes-and-schools
Readiness and Emergency Management for Schools: rem.s.ed.gov
EERI School Seismic Safety Initiative: www.eeri.org/projects/schools/
FEMA hazard mitigation assistance grants: www.fema.gov/hazard-mitigation-assistance
British Columbia’s mitigation program: www2.gov.bc.ca/gov/content/education-training/administration/resource-management/capital-planning/seismic-mitigation-program

Learn More at CREW.ORG