School Safety Guide for Natural Hazards (FEMA P-1000)

Schools as Leaders in Community Resilience
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Acknowledgements

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- Cindy Swearingen

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- Scott Kaiser
- Jake Moore
- Meghan Mordy
- Katie Murphy
- Jennifer Tobin-Gurley
Project Motivation

• Out-of-date guidance in the U.S.
• Most FEMA products related to school natural hazard safety were developed in the 1980s
• New things to highlight:
  – School for vertical evacuation from tsunamis
  – New *International Building Code (2015)* requirements for tornado safe rooms in schools in highest tornado risk areas
  – Raise awareness of successful efforts to develop earthquake assessment/retrofit programs in several states
Project Objective and Scope

Develop a school safety guide that provides general natural hazard guidance applicable to multiple natural hazards, as well as guidance specific to earthquakes, floods, tornadoes, hurricanes, tsunamis, and windstorms.

Provide guidance on: (1) what to do before, during and after an event; and (2) the physical protection of school facilities (i.e., retrofit and considerations for new school construction)
Project Objective and Scope

• Focused on K-12 public schools, but is applicable to private schools in many cases
• Meant to equip school safety advocates and stakeholders with information, tools, and resources
• Aims to empower and support decision-makers by providing actionable advice
Intended Audience

- School and district administrators
- School facilities managers
- School emergency managers
- Teachers and school staff
- Local/state officials
- School boards
- Teachers union leaders
- Local/regional seismic safety advocates
- Concerned parents
- Students
## Project Team

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<tr>
<th>Disaster Experience</th>
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<th>Working Group</th>
<th>Focus Groups</th>
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## Technical Design Expertise

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Project Process: Literature Review

• What is already out there?
• What challenges are people facing?
• What gaps can we fill?

Help inform the development of the School Safety Guide
Project Process: Literature Review

- Purpose
- Disaster stage(s)
- Disaster impacts
- Methods
- Target audience
- Study location
- School type/characteristics
- Building information
- Hazard type
- Disaster risk reduction activity
- Communication information
- Challenges
- Negative/positive case examples
- Figure(s)/image(s)
- Relevance

Reviewed 255 documents

- Academic: 148 documents (58%)
- Institutional/Organizational: 96 documents (38%)
- Media or Public Relations: 11 documents (4%)
Project Process: Literature Review

Comprehensive School Safety Framework

Pillar 1. Safe Learning Facilities
- Safe site selection
- Building codes
- Performance standards
- Disaster resilient design

Pillar 2. School Disaster Management
- Building maintenance
- Non-structural mitigation
- Fire safety
- Assessment & Planning
- Physical & Environmental Protection
- Representative/Participatory SDM committee
- Educational continuity plan
- Standard operating procedures
- Contingency planning
- Household disaster plan
- Family reunification plan
- School drills

Pillar 3. Risk Reduction and Resilience Education
- Structural safety education
- Construction as educational opportunity
- Formal curriculum integrations & infusion
- Teacher training & staff development
- Consensus-based key messages
- Extracurricular & community-based informal education
- Multi-hazard risk assessment
- Education sector analysis
- Child-centred assessment & planning

Aligned to national, subnational and local disaster management plans

Education Sector Policies and Plans
Project Process: Literature Review

Types of challenges mentioned in the literature review under Pillar 1, Safe Learning Facilities

- Cost/Budgetary Constraints (20%)
- Stakeholder Cooperation (17%)
- Regulatory Review (15%)
- Access to Expertise (15%)
- Time (13%)
- Resistance to Change (11%)
- Seismic Considerations (5%)
- Building Code Compliance (4%)
Project Process: Focus Groups

- Videoconference calls to discuss draft Guide
- Representatives of intended audience
- Diversity in:
  - Level of experience with school safety planning
  - Geographical area
  - Type of hazard exposure
  - Past hazard event experience
  - Size of school/district
Project Process: Focus Groups

• How can we best serve our intended audience?
• How do we communicate information in an effective way for our intended audience?

Feedback helped inform how to design the School Safety Guide and what information to include
School Safety Guide Structure: **Cover**

- Vertical evacuation school in Washington
- New tornado safe room requirements
- Emphasize that DCH is the safest action for students in U.S. schools
<table>
<thead>
<tr>
<th>Sections</th>
<th>Content</th>
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</table>
| Comprehensive Approach         | Ch 1: An Introduction to School Natural Hazard Safety  
| for School Natural Hazard      | Ch 2: Identifying Relevant Hazards  
| Safety                         | Ch 3: Making School Buildings Safer  
|                                | Ch 4: Planning the Response  
|                                | Ch 5: Planning the Recovery  
|                                | Ch 6: Engaging the Whole Community  
|                                | Ch 7: Moving Forward  
|                                | E: Earthquakes  
|                                | F: Floods  
|                                | H: Hurricanes  
|                                | TO: Tornadoes  
|                                | TS: Tsunamis  
|                                | W: Windstorms: Straight-Line and Down-Slope  
|                                | X: Other Hazards: Winter Storms, Volcanic Eruptions, and Wildfires  
|                                | Resources Appendix  
|                                | Earthquake Appendix  
|                                | Flood Maps Appendix  
| Hazard-Specific Supplements    | Recommended for all readers  
| Appendices                     | General, applicable to all natural hazards  

Chapter 6, Engaging the Whole Community

Who should be involved? Why is their participation important? How can they contribute?

- Children and youth
- Design professionals
- Educational professionals
- Elected officials
- Emergency management professionals
- Labor bargaining units
- Local business and industry
- Local community organizations
- Local hospitals
- Local jurisdiction public agencies
- Media
- Parents and caregivers
### Table 1-1 Structure of this Guide

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**General, applicable to all natural hazards**

Recommended for all readers

**Detailed information focused on particular hazards**

Users should only need to read relevant hazards
Hazard-Specific Supplements

• Overview of _____
• Is your School in a _____-Prone Region?
• Making Buildings Safer
• Planning the Response
• Planning the Recovery
• Recommended Resources

- E: Earthquakes
- F: Floods
- H: Hurricanes
- TO: Tornadoes
- TS: Tsunamis
- W: Windstorms
School Safety Guide Structure:

Blue Side Boxes

School leaders should reach out to local building professionals to pre-arrange school building evaluations after a disaster. Local building professionals will likely be very busy following a hazard event and might not be immediately available for inspection without prior arrangement.

How old are your school buildings?
Over 40% of school buildings in the United States are over 15 years old, meaning that they were not designed and constructed to the latest building codes and standards requiring schools to be 25% stronger (U.S. Department of Education, 2012). The average public school building is over 40 years old (NCES, 2014).


It took 7 months for the last Katrina child to be reunited with a parent (Save the Children, 2015).

“Schools shall be URM Free by 2033” – this policy statement released in 2016 by the Earthquake Engineering Research Institute highlights the needed actions to keep students safe from collapse-prone URM school buildings. More details can be found here: www.eeri.org/advocacy-and-public-policy/schools-shall-be-urm-free-by-2033/

FEMA Grant Opportunities for School Natural Hazard Safety Improvements:

Before A Disaster: Pre-Disaster Mitigation (PDM) Grants

After A Disaster: Post-Disaster Hazard Mitigation Grants (HMGP)

More information can be found here: https://www.fema.gov/hazard-mitigation-assistance.
Vignettes

When Floods Displace a School: The Value of Planning Ahead

In August 2013, Colorado's St. Vrain School District led a disaster preparedness tabletop exercise with the principals of Lyons Elementary and Middle/Senior High Schools where they developed two options for readjustment if a natural disaster were to occur: (1) they would divide students between other schools across the school district; or (2) they would institute an agreement with the tenants of another nearby school to use their facilities as a temporary school location during displacement. Little did administrators know at the time, this plan would need to be implemented only a few short weeks later.

In September 2013, Colorado experienced multiple days of record-breaking rainfall and flash flooding that resulted in 10 deaths and the evacuation and forced relocation of approximately 18,000 residents. The small community of Lyons, Colorado, was devastated. Due to road and bridge failures, residents were trapped for 36 hours as they waited for National Guard assistance. Lyons experienced an almost complete loss of services including power, telephone, sewage, and potable water. Due to the damage incurred by the town, residents were evacuated and unable to return for six weeks.

Although Lyons Elementary and Lyons Middle/Senior High Schools escaped the flood damage, the buildings remained inaccessible to students and staff due to the massive destruction in other parts of the community. Over 700 students were displaced. While this disaster could have caused chaos for unprepared schools, Lyons was prepared.

Within one week of the flood—and with the feedback and collaboration of principals from both schools—the school district announced that they would resume classes beginning the week of September 23, just 9 days after the floodwaters ravaged Lyons. Both schools were reopened 11 miles east of Lyons in a neighboring community. The students, faculty, and staff met on their regular class schedule for nearly three months at the temporary location until they finally returned to their homes schools on December 2, 2013. Without the foresight of planning, over 700 school children would have faced severe academic consequences. For the sake of these children, planning truly mattered (Tobin-Gutley, 2016).

A Lesson That Saved Lives

On the day after Christmas in 2004, ten-year-old Tilly Smith of Surrey, England, was on vacation in Thailand with her parents. Smith had learned the warning signs of tsunamis in her geography class at Danes Hill School just two weeks prior. Seeing the water recede from Maikhao Beach and recognizing that a tsunami could be imminent, she alerted local officials who helped to clear the beach. Smith’s timely warning saved nearly a hundred tourists and local beachgoers. Maikhao was one of the few beaches on Phuket Island with no reported casualties during the Indian Ocean tsunami, the most deadly tsunami disaster in recorded history.

Keeping Students and the Community Safe

After nearly one-third of Joplin, Missouri, was flattened when a massive EF5 tornado touched down, community leaders dedicated to build back better. And that they have done. According to FEMA, the number of safe rooms in Missouri has doubled since the Joplin tornado in May of 2011. The city of Joplin had 14 community safe rooms as of May 2016, many of them located inside local schools. This will ensure that both students, and members of the public, have somewhere to go in the event of a disaster.

FEMA helps fund the construction of safe rooms through their Hazard Mitigation Grant Program. If a community has experienced a major disaster, FEMA will pay for up to 75 percent of the cost to build a storm shelter, and the community or school district must fund the remaining 25 percent (McTavish, 2016).

Figure 3-2 Schoolchildren affected by the Colorado floods. (Photo courtesy of Peggy Eyer, One Million Faces Project.)

Figure 3-2 Tornado safe room placard.
Next Steps…

• Finalize FEMA P-1000 – coming soon!
• Present at conferences/events that attract our intended audience (decide on the list of potential events…)
• Develop a national webinar providing an overview of FEMA P-1000
Thank you!