



Identify measures to take in advance of an earthquake to eliminate and/or reduce the loss of life and property at our schools.



- **Evacuation Routes**
- **Non-Structural Mitigation**
- **Structural Mitigation**
- **Vulnerability Assessments**
- **Rapid Visual Assessments**
- **Oregon Seismic Rehabilitation Grant Program**





- ***Prevention:*** Actions to ***decrease the likelihood*** that an event or crisis will occur.
- ***Mitigation:*** Actions to eliminate or ***reduce the loss of life and property damage*** related to an event or crisis, particularly those that cannot be prevented.

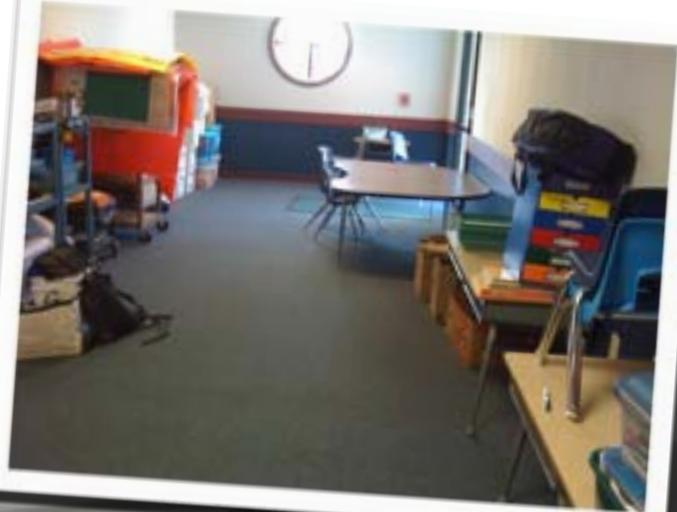


Resource: REMS TA Center Website: <http://rems.ed.gov>

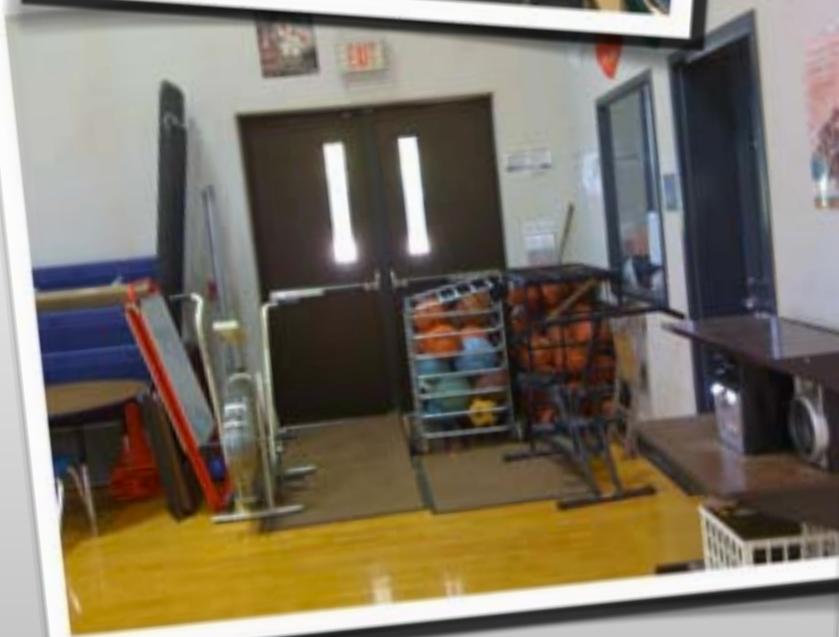




Evacuation Routes – Interior Hazards



- ✓ Keep exit routes clear.
- ✓ Consider glass in cases.



Evacuation Routes – Exterior Hazards



- Brick (URM)
- Glass
- Awnings
- Covered Walkways
- Chimneys
- Roofs



Evacuation Routes – Exterior Hazards



Get help from facilities managers, law enforcement, departments of public works, and fire service professionals in evaluating your buildings.





Reduce/avoid injuries by reducing hazards in your classroom.

- Do not stack things above head level.***
- Secure book shelves and other furniture.***
- Keep your fire extinguisher in operating condition and strapped to a wall.***



Secure Furniture and Other Contents

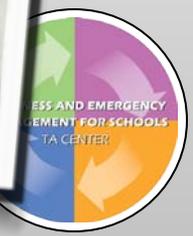


Straps, buckles, and other products are widely available.



PREVENTION-MITIGATION

Secure Furniture and Other Contents

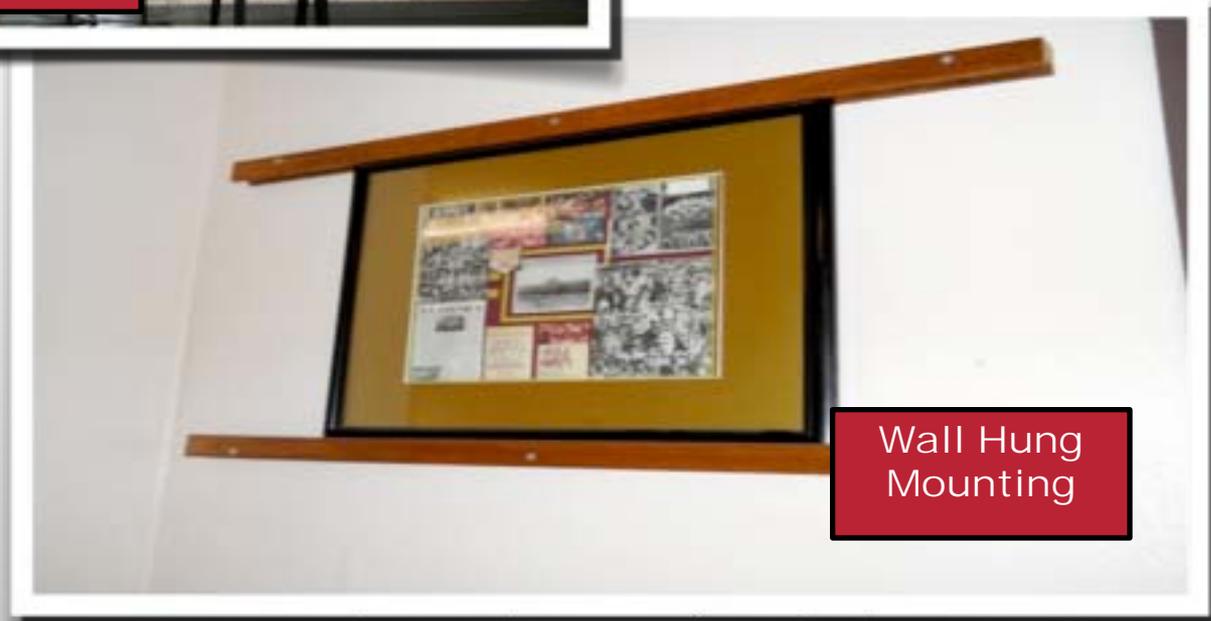


PREVENTION-MITIGATION

Non-Structural Mitigation Features



Music Room
Instrument Cages



Wall Hung
Mounting



PREVENTION-MITIGATION

Non-Structural Mitigation Features



AV Technical
Equipment Strapping



AV Technical
Equipment Strapping

PREVENTION-MITIGATION Non-Structural Mitigation Features



PREVENTION-MITIGATION

Non-Structural Mitigation Features



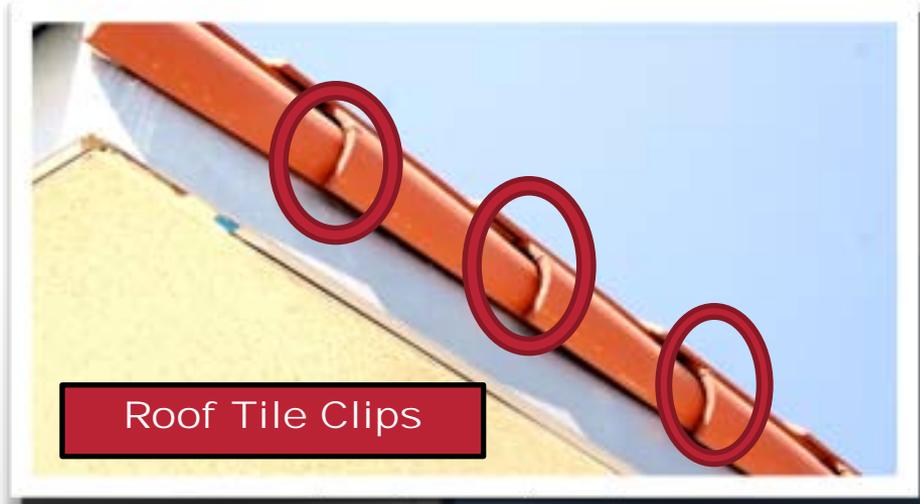
Whiteboard Mount



Storage Shelf Fastener



PREVENTION-MITIGATION Non-Structural Mitigation Features



PREVENTION-MITIGATION

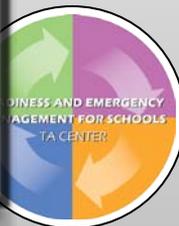
Non-Structural Mitigation Features



Roof Bracing



**Kitchen Equipment
Fastener**



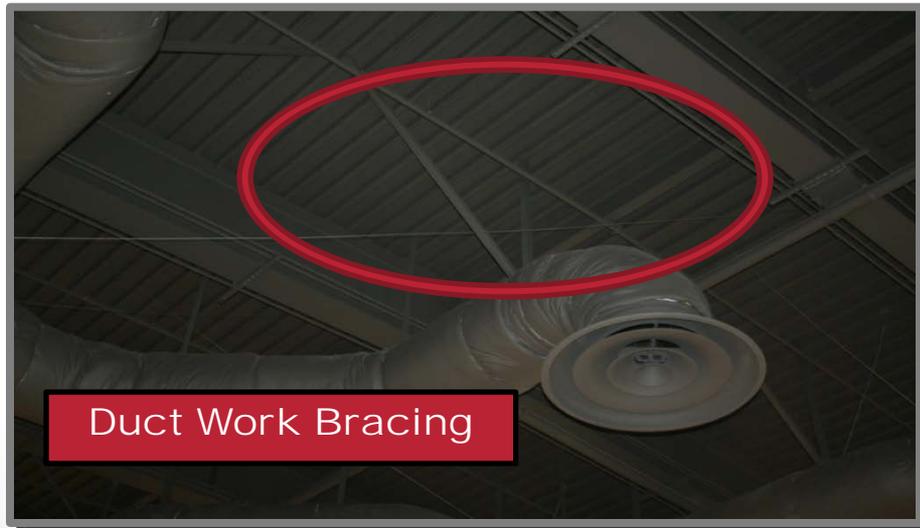
Non-Structural Mitigation Features



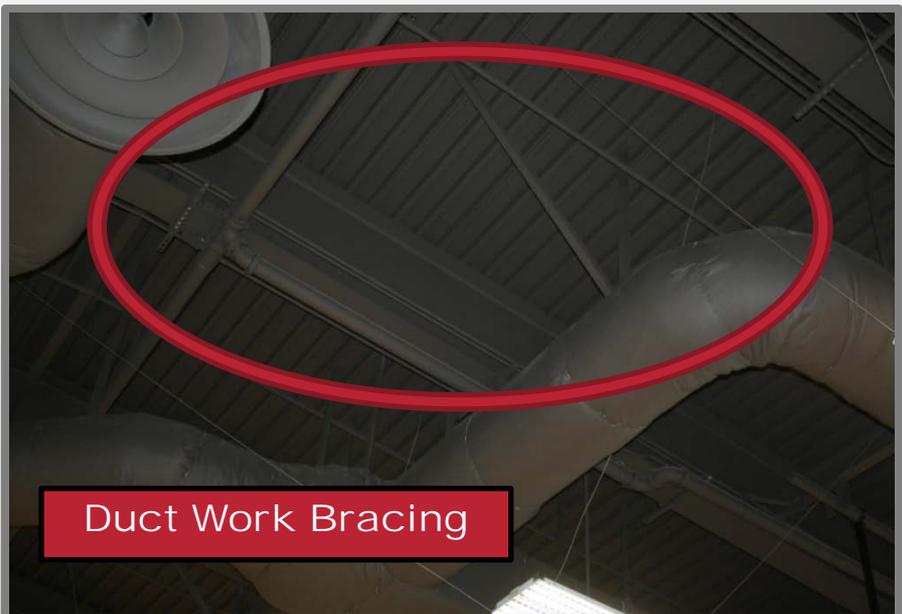
PREVENTION-MITIGATION Non-Structural Mitigation Features



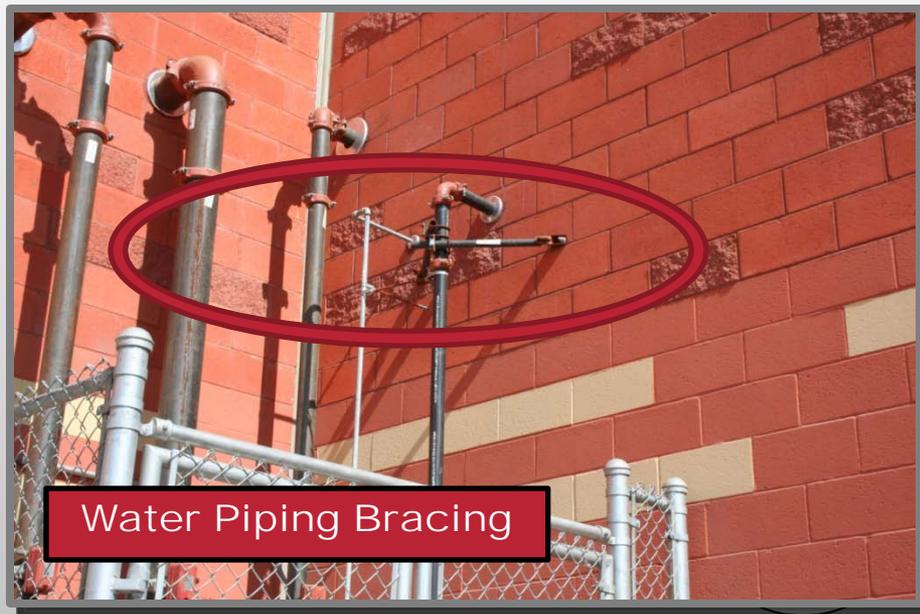
Electrical Equipment Bracing



Duct Work Bracing

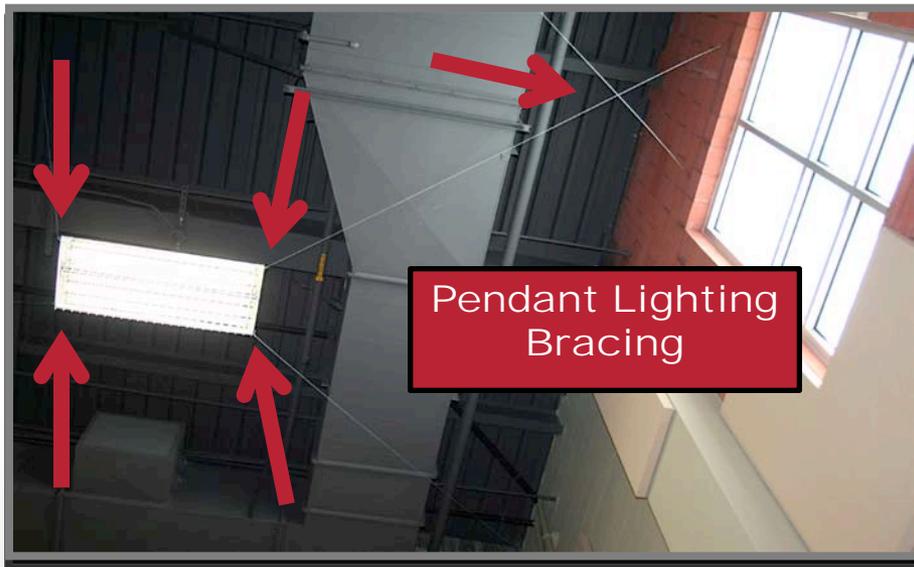


Duct Work Bracing

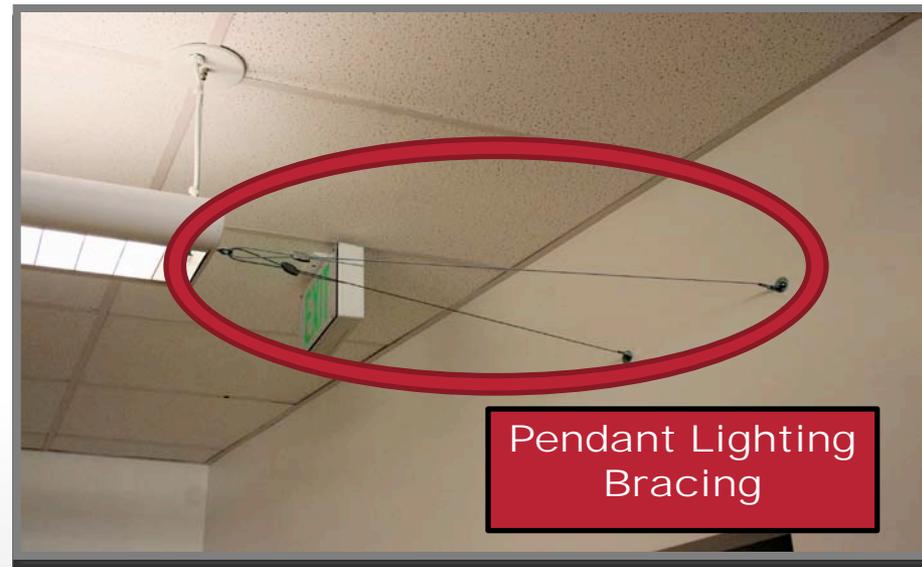


Water Piping Bracing

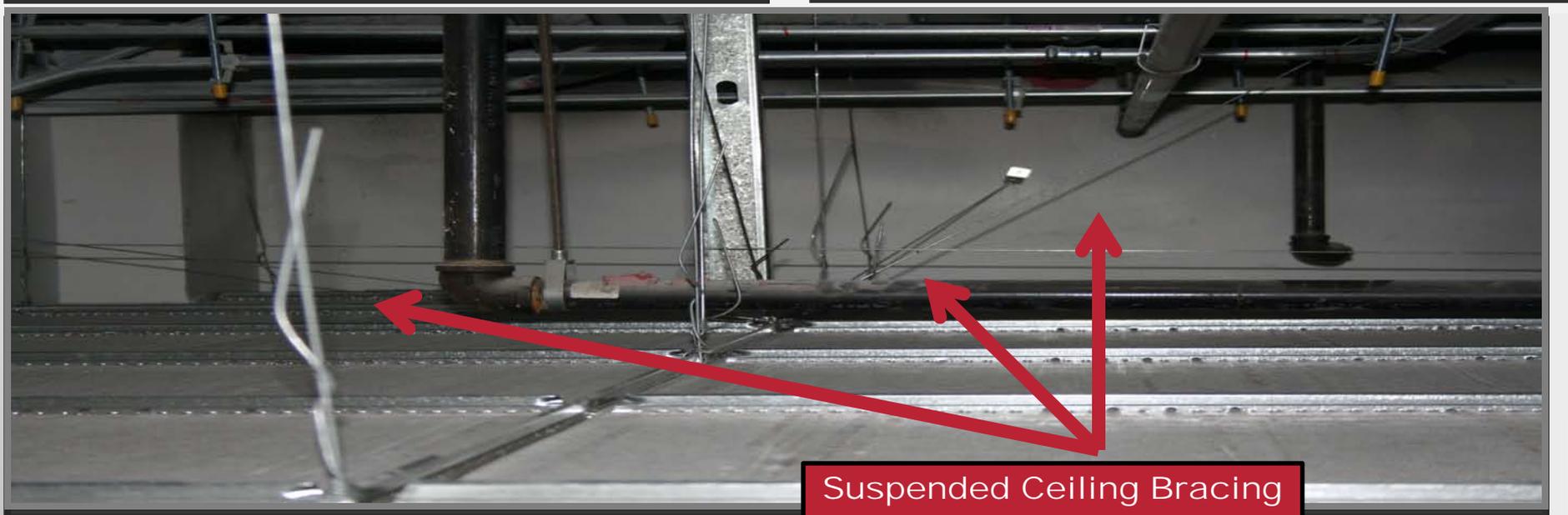
PREVENTION-MITIGATION Non-Structural Mitigation Features



Pendant Lighting Bracing



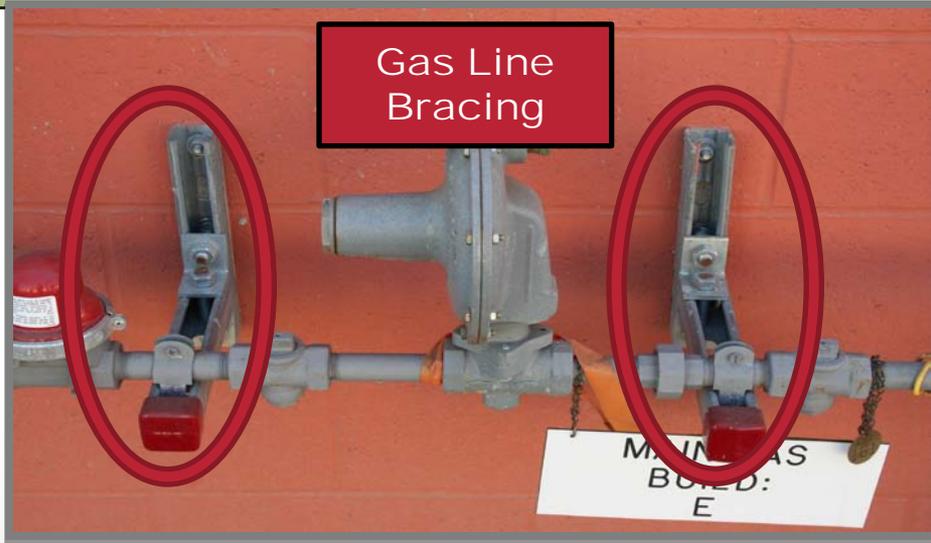
Pendant Lighting Bracing



Suspended Ceiling Bracing

PREVENTION-MITIGATION

Non-Structural Mitigation Features



Gas Line Bracing



Earthquake Valve

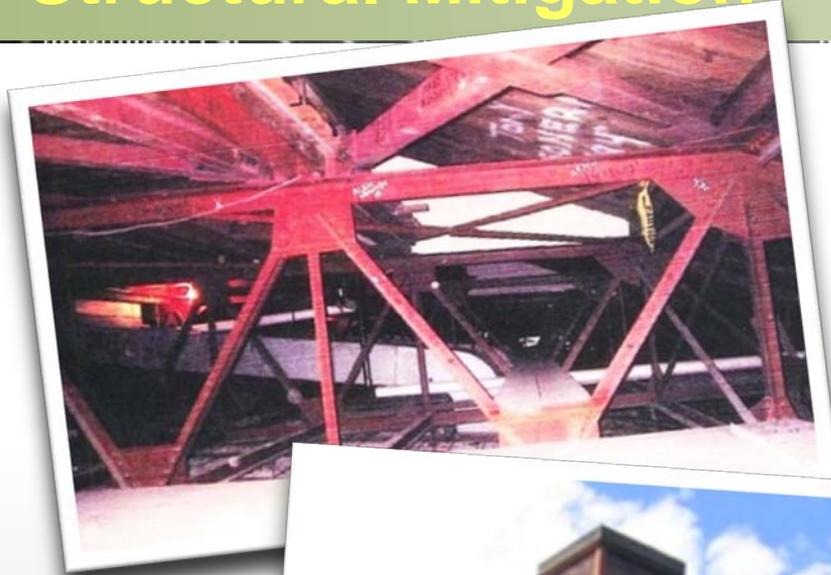


Fire Sprinkler System Bracing



Fire Sprinkler System Bracing

PREVENTION-MITIGATION Structural Mitigation



- Saves lives
- Reduces injuries
- Reduces property damage





- Establish a team**
- Select assessment tool**
- Conduct assessment**
- Make a plan for corrections**
- Enact the plan**
- Reevaluate**





Why Collaborate?

- Collective wisdom
- Critical to entire plan
- Proactive, can reduce liability
- Community hazards
- Efficient
- Ownership





District/School Staff

- Administrators, educators
- Facilities managers, janitorial and grounds staff
- Parents/guardians and students
- School nurses, physical education staff and playground monitors
- Food service managers
- Bus managers



PREVENTION-MITIGATION

Establish a Team



First Responders

Fire

Police

EMS

City/County Emergency Managers

Public Works

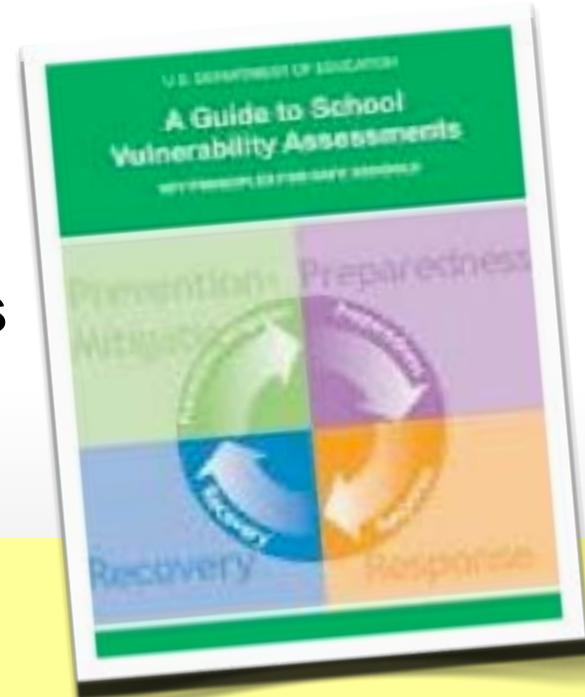
Red Cross



Select an Assessment Tool



- All hazards
- Earthquake considerations
- Assess strengths & challenges
- Best practices



Resources:

Guide to School Vulnerability Assessments

http://rems.ed.gov/docs/VA_Report_2008.pdf

American Clearinghouse on Educational Facilities Vulnerability/Hazard Assessment Checklist:

http://rems.ed.gov/docs/ACEF_ED_FacilitiesVulnerability-HazardChecklist.pdf

Resource Repository: Sample Vulnerability Assessment Tools

http://rems.ed.gov/index.php?page=resources_Repository





Portland Public Schools Sample Classroom Assessment

Identifying School-Based Hazards—Classroom Mitigation Checklist

This checklist can be used by administrators, teachers, or staff to analyze classroom hazards that can be mitigated at little or no cost. Complete this form for each classroom surveyed. Use the information gathered during the classroom hazard assessment to determine the scope of classroom hazards throughout the school and to develop a plan and schedule to reduce the hazards.

Room: _____

Surveyed By: _____ Date Surveyed: _____

Hazard	Mitigation Measures
<input type="checkbox"/> Free-standing cabinets, bookcases, and wall shelves	
<input type="checkbox"/> Heavy objects on high shelves	
<input type="checkbox"/> Aquariums and other potentially hazardous displays located near seating areas	
<input type="checkbox"/> Unsecured TV monitors	
<input type="checkbox"/> Unsecured wall-mounted objects	
<input type="checkbox"/> Hanging plants above or near seating areas	
<input type="checkbox"/> Incompatible chemicals stored in close proximity (e.g., window cleaner and ammonia)	
<input type="checkbox"/> Paper or other combustibles (e.g., greasy rags) stored near heat sources	
<input type="checkbox"/> Other hazards (List):	



Conducting Vulnerability Assessments



- Conduct the assessment**
- Make a corrective action plan**
 - Immediate**
 - Short-term**
 - Long-term (secure funding if needed)**
- Reevaluate**

Consider leveraging the quarterly OSHA workplace safety inspection for ongoing accountability & evaluation.





A generational goal: make every Oregon school earthquake-safe.

- **Began in 2001 (ORS 455.400)**
- **10 years to pass and implement laws that underpin the program**
- **20 years left to do the work**
- **Goal: Complete retrofits by 2032**



PREVENTION-MITIGATION

Oregon Seismic Rehabilitation Grants Program



Cannon Beach Elementary Clat_sch04A

Construction Year Built (Per Verified)	Year Built (All Sources)	Est. Occupied
1947	1947	Yes
Total Area (square ft)	Number of Stories	Basement
19472	3	Yes
Plan Irregularities	Vertical Irregularities	
None	None	
None	None	
None	None	
Falling Members	Four Conditions	
Other Brick Veneer	None	
Unreinforced Chimneys	None	
None	None	

Cannon Beach Elementary Clat_sch04A

Seismic ID 10

Building Type	County
School	Clatsop
Street	
350 Beaver St	
City	State
Cannon Beach	OR
Latitude	Longitude
45.90148	123.99918
Tracking Code	Inspection Date
RVS #=2006	5/18/2006

Seismicity Zone: Very High

FEMA 154 Rapid Visual Screening Score Card										
	East	West	High	Low	High	Low	High	Low	High	Low
Primary	0	0	0	0	0	0	0	0	0	0
Secondary	0	0	0	0	0	0	0	0	0	0
Tertiary	0	0	0	0	0	0	0	0	0	0

Cannon Beach Elementary	
Final RVS Score	Final Score
WG	3.4

FEMA-154 Collapse Potential	
Low (<1%)	

OregonGeology Rapid Visual Screening - Senate Bill 42 - Seismic Hazards Assessment Oregon Department of Geology and Mineral Industries

2007 - Statewide Seismic Needs Assessment

- Over 1,100 K-12 schools qualified for the assessment, covering 90% of enrolled public school students in every county and 100% of the vulnerable coastal community schools were surveyed. FEMA Rapid Visual Screening process was used.
- The assessment looked at these key factors:
 - Seismic hazard zone (high vs. low history/probability of earthquake);
 - Building structural type (wood, concrete, masonry, reinforced, etc.); and
 - Original construction date, soil type (dense to soft).



PREVENTION-MITIGATION

Oregon Seismic Rehabilitation Grants Program



Cannon Beach Elementary Clat_sch04A

Foundation	Year Built (Year Verified)	Year Built (All Sources)	Est. Occupied
117	1960	1960	1960
Total Area (square ft)	Number of Stories	Basement	Founding Potential
19472	0	No	Yes

Plan Irregularities	Vertical Irregularities
Name	Name
None	None
None	None

Falling Members	Four Conditions
Other Brick Veneer	Name
Unreinforced Chimneys	Name
None	None

Cannon Beach Elementary Clat_sch04A

Building Type	County
School	Clatsop
Street	
050 Beaver St	
City	State
Cannon Beach	OR
Latitude	Longitude
43.90148	123.99918
Tracking Code	Inspection Date
RVS # 2006	9/18/2006

Seismicity Zone: Very High										
FEMA 154 Rapid Visual Screening Score Card										
Type	East	West	High	Low	Mid	High	Mid	Low	Mid	High
Primary	0	0	0	0	0	0	0	0	0	0
Secondary	0	0	0	0	0	0	0	0	0	0
Tertiary	0	0	0	0	0	0	0	0	0	0

Final RVS Score	
Final Type	Final Score
W2	3.4

FEMA-154 Collapse Potential	
Low (<1%)	

OregonGeology Rapid Visual Screening - Senate Bill 62 - Seismicity Trends Assessment Oregon Department of Geology and Mineral Industries

2007 - Statewide Seismic Needs Assessment

Of the 2,182 buildings screened in 170 school districts, over 40% were rated a high or very high risk of collapse. This includes 11 schools at the coast that are sited within the tsunami inundation zone.

The ratings—low, medium, high and very high—are related to the likelihood, or probability, of a building sustaining major life threatening damage, given the occurrence of a maximum considered earthquake.



PREVENTION-MITIGATION

Oregon Seismic Rehabilitation Grants Program



Cannon Beach Elementary Clat_sch04A

Construction Year Built (Per Verifier)	Year Built (All Sources)	Est. Occupied
1977	1980	1980
Total Area (square ft)	Number of Stories	Basement
19472	3	Partial
Plan Irregularities	Vertical Irregularities	Founding Potential
None	None	Yes
Other Brick Veneer	Four Conditions	
Unconformal Chimneys	None	
None	None	

Cannon Beach Elementary Clat_sch04A

Building Type	County
School	Clatsop
Street	
3500 Beaver St	
City	State
Cannon Beach	OR
Latitude	Longitude
45.90148	123.99918
Trading Code	Inspection Date
RVS #=2006	5/18/2006

Seismicity Zone: Very High										
FEMA 154 Rapid Visual Screening Score Card										
Type	East	West	High	Low	High	Low	High	Low	High	Low
Primary	0	0	0	0	0	0	0	0	0	0
Secondary	0	0	0	0	0	0	0	0	0	0
Tertiary	0	0	0	0	0	0	0	0	0	0

Cannon Beach Elementary	
Final RVS Score	
Final Type	Final Score
WG	3.4

FEMA-154 Collapse Potential	
Low (<1%)	

OregonGeology Rapid Visual Screening - Senate Bill 62 - Seismicity Hazard Assessment Oregon Department of Geology and Mineral Industries

- **No other state has a web-based statewide inventory of public education buildings rated for seismic risk.**
- **No other state has a voter-authorized, funded grants program to finance seismic upgrades of public schools on a risk-prioritized basis.**

The statewide report can be found at:
<http://www.oregongeology.org/sub/projects/rvs/>





Grants awarded so far include 22 schools in 17 school districts

2010: 12 K–12 schools in 7 districts awarded grants

✓ \$5.6 million funded improvements protecting more than 4,600 students

2011: 3 K–12 schools in 3 school districts awarded grants

✓ \$3.8 million funded improvements protecting more than 1,600 students

2012: 7 K–12 schools in 7 school districts awarded grants

✓ \$7.5 million to fund improvements that will protect more than 2,300 students (work anticipated in summer 2013)

Information on the grant program, administered by Oregon
Emergency Management, can be found at:
<http://www.oregon.gov/OMD/OEM/Pages/index.aspx>

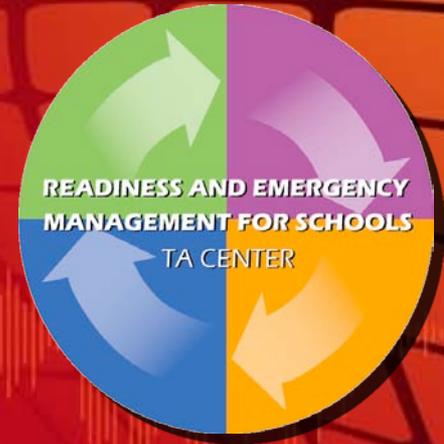


Self Assessment/Action Plan



- **Evacuation routes**
- **Non-structural mitigation**
- **Structural mitigation**
- **Vulnerability assessments**
- **Rapid visual assessments**
- **Oregon Seismic Rehabilitation Grant Program**





BREAK!

**U.S. Department of Education
Office of Safe and Healthy Students
Readiness and Emergency Management for Schools (REMS)
Technical Assistance (TA) Center**