ATI RESTORATION

How Businesses Can Prepare for Earthquakes

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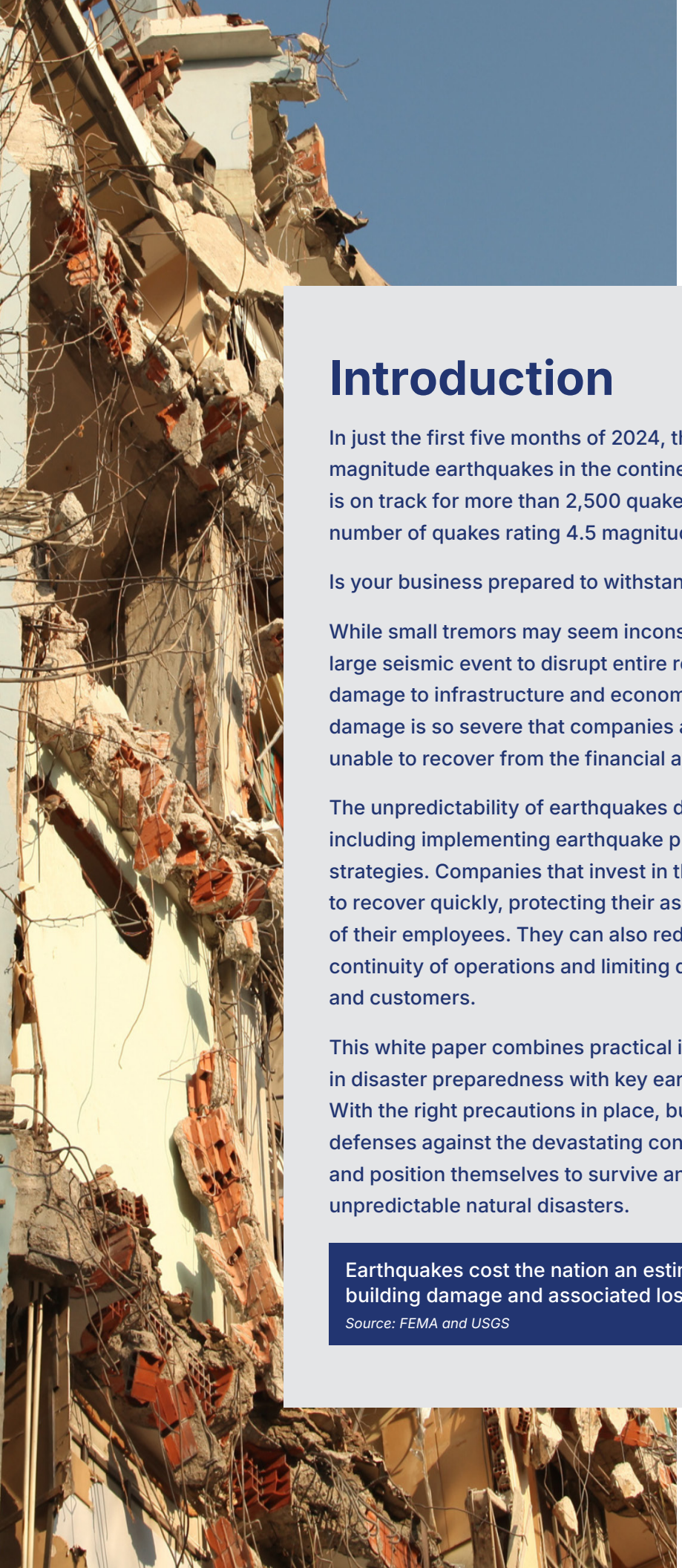


Introduction

In just the first five months of 2024, there were nearly 1,000 2.5+ magnitude earthquakes in the continental United States. The country is on track for more than 2,500 quakes this year—with a record number of quakes rating 4.5 magnitude or higher.

Is your business prepared to withstand the next earthquake?

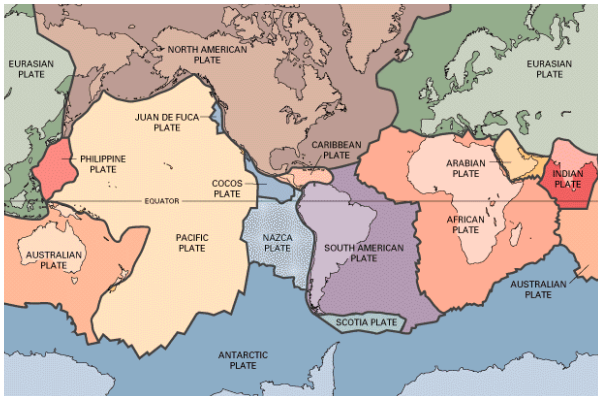
While small tremors may seem inconsequential, it only takes one large seismic event to disrupt entire regions, causing widespread damage to infrastructure and economic systems. In some cases, the damage is so severe that companies are forced to close permanently, unable to recover from the financial and operational losses.

The unpredictability of earthquakes demands proactive planning, including implementing earthquake preparedness and mitigation strategies. Companies that invest in these efforts are more likely to recover quickly, protecting their assets and ensuring the safety of their employees. They can also reduce downtime, ensuring continuity of operations and limiting disruptions to their workforce and customers.

This white paper combines practical insights from our experience in disaster preparedness with key earthquake mitigation strategies. With the right precautions in place, businesses can strengthen their defenses against the devastating consequences of earthquakes and position themselves to survive and thrive, even in the face of unpredictable natural disasters.

Earthquakes cost the nation an estimated $14.7 billion annually in building damage and associated losses.
Source: FEMA and USGS

What Causes Earthquakes?



Earthquakes are caused by the sudden release of energy from the Earth's crust, which creates seismic waves that shake the ground. The Earth's outer layer, or crust, is divided into large pieces called tectonic plates. These plates are constantly moving, though usually at a slow pace. However, they can become stuck at the boundaries where these plates meet due to friction. Over time, stress builds up as the plates continue to push against each other.

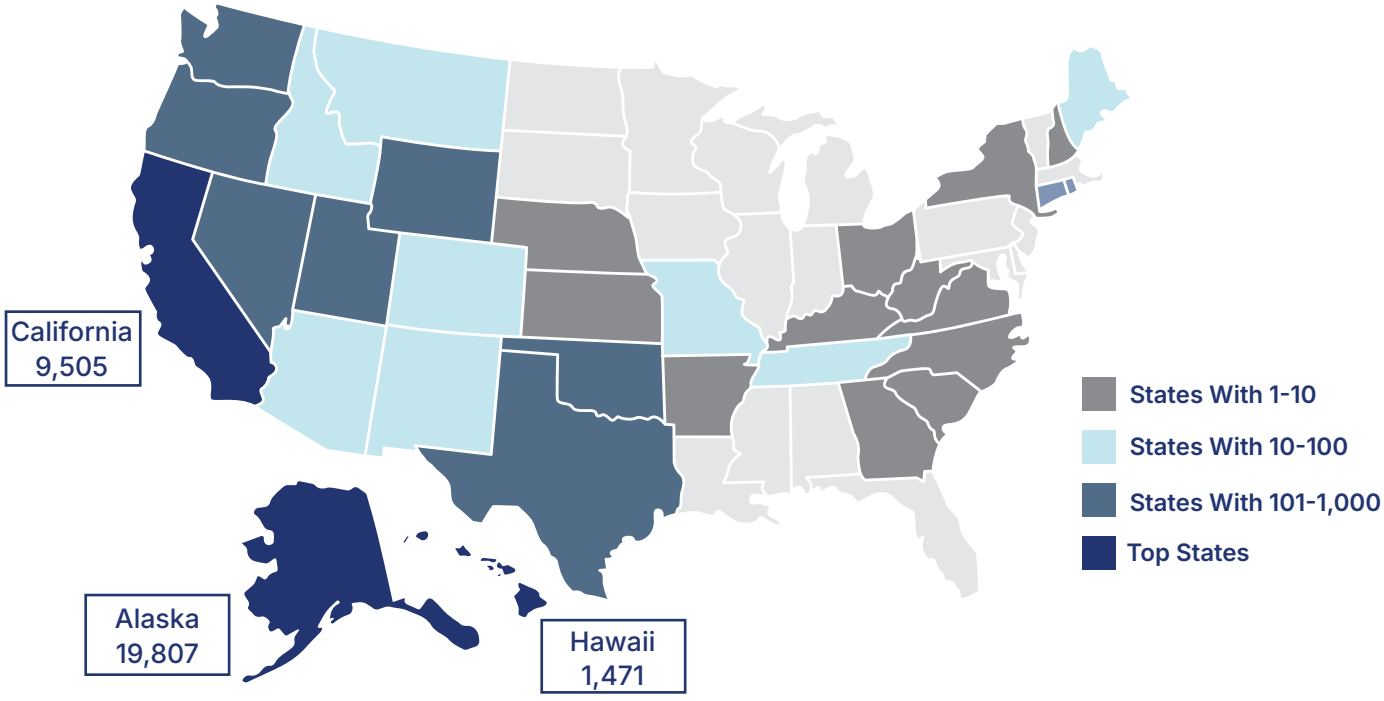
When the stress overcomes the friction, the plates suddenly slip and release the built-up energy. This movement causes the ground to shake, resulting in an earthquake. The point within the Earth where this movement occurs is called the focus or hypocenter, while the point directly above it on the surface is called the epicenter.

While natural earthquakes result from tectonic forces, human activities can alter the Earth's underground conditions, sometimes triggering seismic events. Human-induced earthquakes have become more common with the rise of industrial activities like oil and gas extraction, geothermal energy production, and the construction of large dams. States like Oklahoma and Kansas have seen a sharp rise in seismic activity due to wastewater injection, transforming once-quiet areas into regions with frequent small to moderate earthquakes.

The severity of an earthquake depends on several factors, including the amount of energy released, the depth at which the earthquake occurs, and the distance from the epicenter. Earthquakes can also trigger secondary

Earthquakes by State in 2023

Source: World Population Review



Top 10 Costliest U.S. Earthquakes by Inflation-Adjusted Insurance Losses ($ Millions)

Rank	Date	Event	Location	Insured losses when occurred	In 2023 Dollars
1	Jan. 17, 1994	Northridge	CA	$15,300	$32,210
2	Apr. 18, 1906	San Francisco	CA	235	8,295
3	Oct. 18, 1989	Loma Prieta	CA	960	2,353
4	Feb. 28, 2001	Nisqually	WA	315	551
5	Jan. 7, 2020	Puerto Rico	PR	425	507
6	Aug. 24, 2014	South Napa	CA	200	259
7	Feb. 9, 1971	San Fernando	CA	32	244
8	Oct. 1, 1987	Whittier Narrows	CA	75	200
9	Nov. 30, 2018	Anchorage	AK	150	183
10	Aug. 23, 2011	Virginia	VA, DC	100	136

Source: Insurance Information Institute

Understanding the Business Risks and Costs of Earthquakes

Earthquakes pose both immediate and long-term risks to businesses. Ground shaking is the most recognizable threat, but secondary hazards such as fires, tsunamis, and infrastructure damage can have equally devastating effects. Businesses in all regions should review their preparedness strategies, not just those in high-risk zones.

When earthquakes strike, businesses face a range of risks, including these:

- Structural damage to buildings, potentially making them unsafe or unusable
- Utility disruptions, such as power, water, and gas outages, that can halt business operations
- Supply chain disruptions as vendors or partners in affected regions may be unable to fulfill obligations

According to research from the Federal Emergency Management Agency (FEMA), National Earthquake Hazards Reduction Program (NEHRP), and the U.S. Geological Survey (USGS), the total estimated economic exposure for buildings and their contents across the United States is about $107.8 trillion. California, Texas, New York, and Florida contribute over 29% of that total.

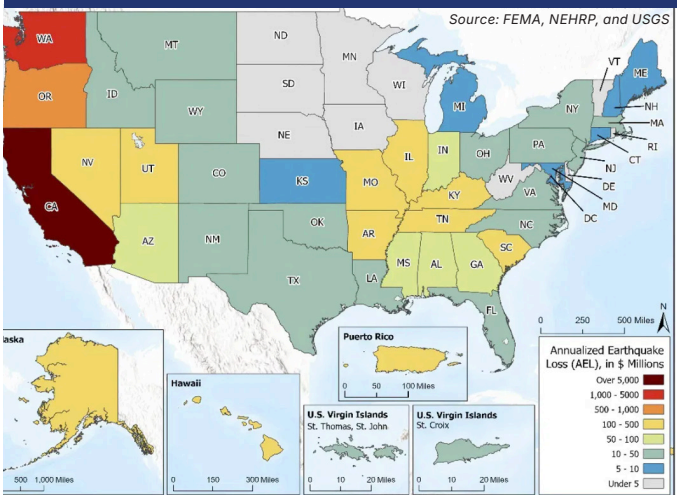
The USGS identifies 10 states—California, Washington, Oregon, Tennessee, Puerto Rico, Utah, Nevada, Missouri, Arkansas, and Hawaii—as having the highest populations exposed to significant earthquake risks. These states collectively account for more than 27% of the nation's economic exposure to earthquake damage. While strong earthquakes in these areas are infrequent, they could lead to significant destruction and casualties.

In the central and eastern United States, areas like the New Madrid Seismic Zone (NMSZ) and Charleston, South Carolina, also face substantial earthquake risks. The NMSZ spans eight states representing about 15% of the nation's total exposure. These states include:

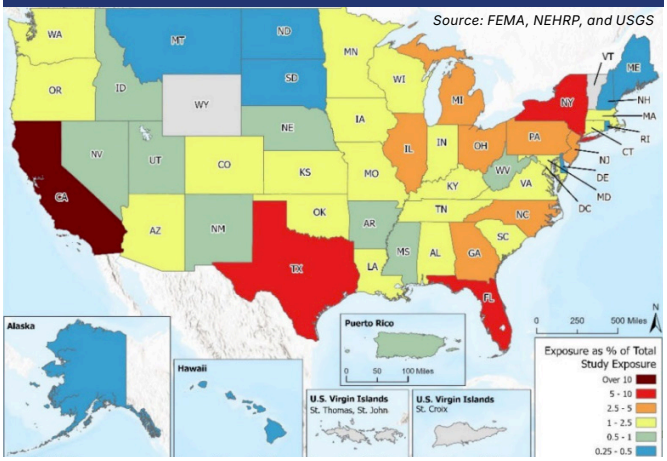
- Illinois
- Indiana
- Missouri
- Arkansas
- Kentucky
- Tennessee
- Oklahoma
- Mississippi

FEMA and the USGS estimate an average annual economic loss (AEL) to the national building stock of $14.7 billion. California accounts for 65% of this loss, around $9.6 billion annually, while the West Coast (California, Oregon, and Washington) contributes 78% of the total national loss. The rest of the United States, including Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands, shares the remaining 22%, or $3.1 billion annually.

Annualized Earthquake Losses (AEL) by State



Distribution of Building Replacement Value by State



The business costs of earthquakes—including building repair costs, contents and business inventory losses, costs of relocation, and capital-related wage and rental losses—show that California is the clear leader. The following map shows the replacement value of buildings by state, based on the value of the building components, excluding contents and land value.

These numbers do not even begin to account for the human losses from earthquakes. In 2023, 225 Californians died in earthquakes. More than 4,000 suffered injuries. The main dangers to workers include being struck by structural components or furnishings and inadequately secured stored materials, burns resulting from gas leaks or electrical shorts, and exposure to chemicals. Many of these hazards are predictable and can be mitigated by hazard identification and disaster planning.

These statistics highlight the importance of adopting strategies that reduce seismic risks, particularly in urban planning and development, to mitigate future losses.

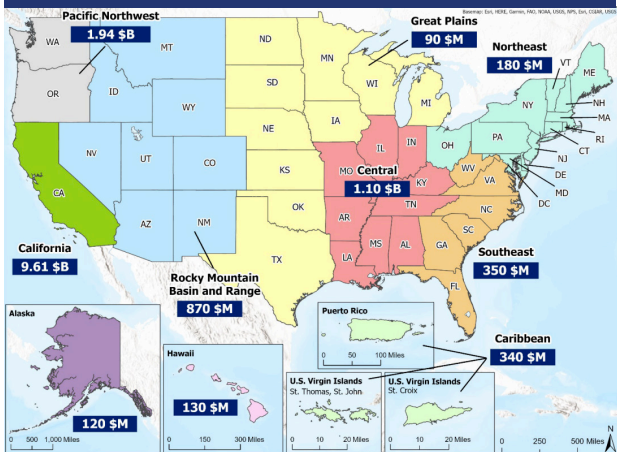
Top 10 States with the Most Annual Injuries and Fatalities from Earthquakes

	Minor Injuries	Major Injuries	Fatalities
1. California	3,897	117	225
2. Washington	526	16	31
3. Oregon	413	14	27
4. Utah	204	7	14
5. Puerto Rico	264	7	14
6. Tennessee	147	4	8
7. Nevada	124	4	7
8. South Carolina	107	3	7
9. Missouri	97	3	6
10. Illinois	93	3	5

Structural Exposure, Nonstructural Exposure, Contents Exposure, and Total Exposure by State (in $millions, ranked by total exposure)

Rank	State	Structural Exposure	NonStructural Exposure	Content Exposure	Total Exposure
1	CA	$1,415,561	$5,482,796	$4,992,829	$11,891,186
2	TX	$1,044,289	$3,789,344	$3,596,553	$8,430,186
3	NY	$652,015	$2,693,171	$2,385,084	$5,730,270
4	FL	$676,331	$2,577,206	$2,290,426	$5,543,962
5	PA	$580,397	$2,131,703	$2,006,215	$4,718,315
6	IL	$578,247	$2,106,248	$1,914,122	$4,625,617
7	OH	$513,622	$1,867,946	$1,816,746	$4,198,313
8	MI	$432,638	$1,621,295	$1,509,922	$3,563,855
9	GA	$415,678	$1,578,095	$1,456,246	$3,450,020
10	NC	$425,970	$1,581,511	$1,435,538	$3,443,020

Distribution of Average AEL by Region



Source: FEMA

Six of the costliest U.S. earthquakes were centered in California. The costliest quake happened in Northridge, California, in 1994 and cost more than $15.3 billion in insured losses—the equivalent of more than $32 billion today.

Source: Insurance Information Institute

How to Prepare for and Respond to an Earthquake

How you prepare for and respond to an earthquake can mean the difference between a quick recovery and long-term disruption for your business. While earthquakes are unpredictable, having a solid plan in place ensures you can protect your employees, minimize damage to your property, and maintain business continuity.

In this section, we provide practical steps to help you assess risks, develop an earthquake preparedness plan, and take actions during and after an earthquake to safeguard your people and your property.

Assess the Risks

- If you are in an area with high seismic activity, prioritize retrofitting and securing your infrastructure. Even businesses in traditionally low-risk zones should not dismiss the possibility of earthquake damage.
- Evaluate your building's construction, especially if it was built before modern seismic codes. Structures made from unreinforced masonry, concrete, or those with irregular designs may be more susceptible to damage.
- Inventory any hazardous substances that may be released in the event of a tremor.

Develop an Earthquake Preparedness Plan

Employee Training & Emergency Supplies Preparedness

- Conduct evacuation drills at least twice a year to familiarize employees with procedures. Train them in the "Drop, Cover, and Hold On" protocol.
- Designate safe spots, like under tables or against interior walls, where no glass can break and heavy furniture won't fall.
- Prepare emergency kits containing water, non-perishable food, flashlights, and first-aid supplies to last your team at least 72 hours.

Business Continuity Planning

- Develop a continuity plan that outlines how your business will maintain operations after an earthquake.

Identify backup suppliers

Create data protection measures

Establish temporary workspaces.

- Compile an emergency contact list for employees and key vendors.
- Check your insurance policy for coverage. Consider obtaining earthquake insurance and business interruption insurance.
- Set up an Emergency Response Agreement (ERA) to guarantee priority service in the event of a catastrophe. Earthquakes cause significant damage, leading to a surge of emergency calls. With an ERA, you get prioritized service from restorers.

Review and update the plan as needed to reflect new construction, changes in business operations, and employee turnover.

Reduce the Risks

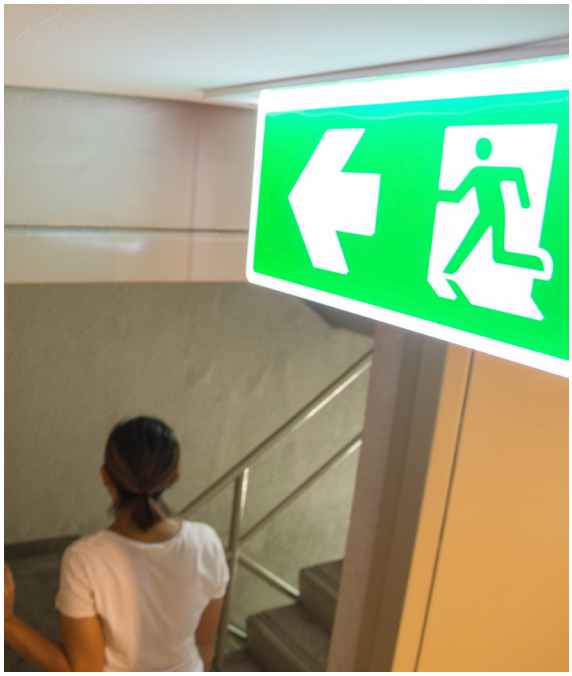
- Retrofit older buildings to meet modern seismic codes and prevent collapse. Retrofitting may include reinforcing walls, adding shear panels, or bracing roofs. Consult with an engineer to determine the best course of action for your building.
- Fix any structural vulnerabilities in the building, such as unreinforced masonry.
- Secure office equipment, file cabinets, signs, fans, shelving, lighting fixtures, and large furniture, which can become dangerous during shaking. Fasten furniture to the walls. Strap or Velcro computers and other electronics to furniture.
- Secure any hazardous chemicals to prevent leaks and spills.

"Drop, Cover, and Hold On" During an Earthquake

- Stay updated on earthquake warnings via radio, television, or computer alerts.
- "Drop, Cover, and Hold On": Take cover under sturdy furniture and away from windows.
- If you're outside, stay outside. Move away from buildings, trees, streetlights, and overhead lines, which could fall and injure you. Crouch down and cover your head. Many injuries occur within ten feet of the entrance to buildings. Bricks, roofing, and other materials can fall from buildings.

Stay Safe After the Shaking Stops

- Stay indoors and move to a safe location.
- Be prepared for aftershocks and continue following safety protocols.
- If you are trapped, send a text. If you do not have access to a phone or if service is down, bang on a pipe or a wall. Cover your mouth with your shirt for protection.
- If you are in a tsunami zone, move to higher ground immediately.
- If you are outdoors, continue avoiding buildings, trees, and power lines.
- After the shaking stops, use the stairs to leave the building, not the elevator, and watch for falling debris. Earthquakes can activate fire alarms and sprinklers, and elevators may be unsafe.



Inspect the Damage After the All Clear

Personal Safety Precautions and Hazard Awareness

- Wear protective clothing, including a long-sleeved shirt, long pants, work gloves, and thick-soled shoes when cleaning debris to avoid injury.
- Stay clear of fallen utility lines or large debris.
- Do not try to move heavy debris by yourself.
- Don a mask before you enter buildings with indoor water leaks or mold growth that you can see or smell.
- Look out for downed trees and large limbs on power lines, vehicles, and buildings.
- Inspect for gas leaks and other hazards before re-entering buildings.

Damage Documentation & Reporting

Once it is safe to re-enter the building, document and report property damage to your insurance carrier and restoration services provider. Look for common issues including:

Structural Damage

- Cracked interior walls
- Shifted, settled, or cracked foundations
- Damaged ceiling tiles
- Cracked windows and facades
- Cracked concrete, pavement, sidewalks, or other flooring
- Displaced rooftop HVAC equipment
- Buckled or dislodged roof flashing

Building Systems and Equipment

- Gas odor or signs of a gas leak
- Fire damage from gas leaks and electrical issues
- Disconnection of fire sprinkler systems
- Damage to electric and water lines
- Water damage from burst pipes and plumbing failures
- Soil liquefaction (loose or water-saturated soil may lose strength, causing sinking or tilting of structures)
- Equipment and machinery damage

The "Drop, Cover, and Hold On" Method

If you feel shaking or get an earthquake alert, immediately take these actions:

DROP onto your hands and knees where you are.

- This position protects you from being knocked down and reduces your chances of being hit by falling or flying objects.

COVER your head and neck with one arm and hand.

- If a sturdy table or desk is nearby, crawl underneath for shelter.
- If no shelter is nearby, crawl next to an interior wall.
- Stay on your knees and bend over to protect your vital organs.

HOLD ON until the shaking stops.

- Under shelter: Hold on to it with one hand and be ready to move with your shelter if it shifts.
- No shelter: Hold on to your head and neck with both arms and hands.

Protect Your Business by Preparing for the Next Earthquake Today

Although earthquakes are unpredictable, businesses that take proactive steps to prepare can protect their employees and assets and increase their chances of bouncing back quickly after an event. ATI has decades of experience helping businesses recover from earthquakes and other catastrophes. Our earthquake-related services include, but are not limited to, the following:

- Immediate Assessment of Earthquake Damage
- Emergency Board-Ups and Tarping
- Safety Evaluation of the Premises
- Debris Removal
- Temporary Repairs
- Structural Repairs

Contact us to learn more about how to set up an Emergency Response Agreement with ATI to help your business accelerate recovery after an earthquake.

70+ LOCATIONS NATIONWIDE

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