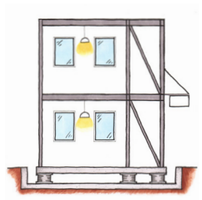
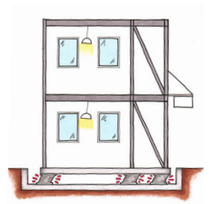
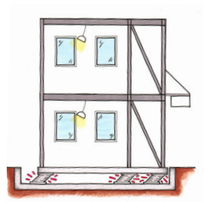
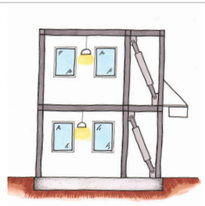
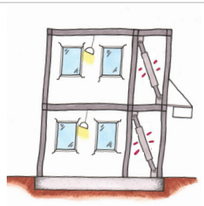
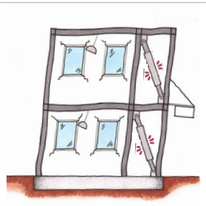
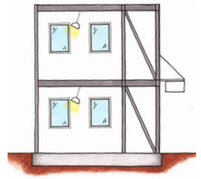
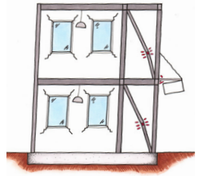
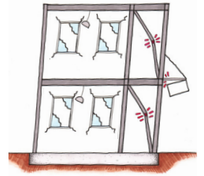
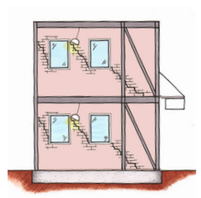
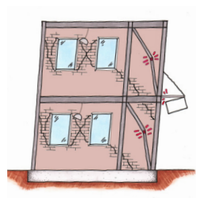
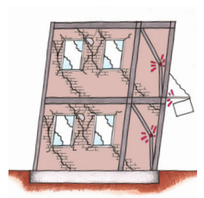
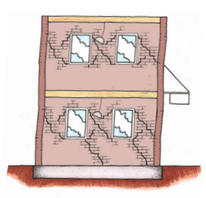
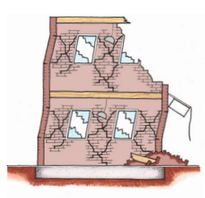
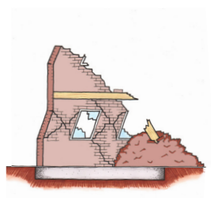
OPTIONS FOR EARTHQUAKE-RESISTANT DESIGN

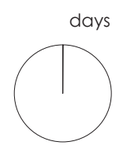
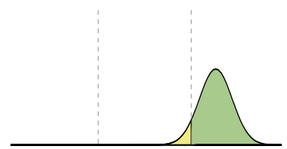
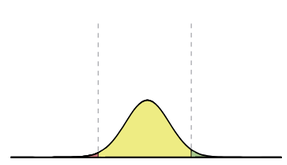
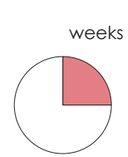
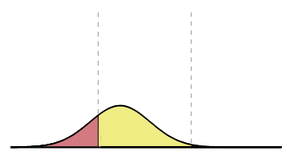
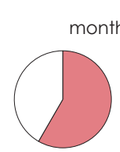
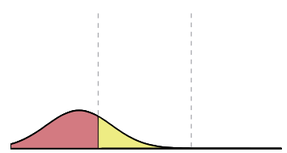
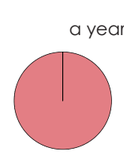
Design Decisions Have Measurable Consequences

FEMA

nehrp

	Moderate EQ 20% chance in 50 years	Major EQ 10% chance in 50 years	Extreme EQ 2% chance in 50 years
New Buildings — Protective System			
New Buildings — Enhanced Code*			
New Buildings — Basic Code			
Older Buildings — Basic Retrofit**			
Older Buildings — Unretrofitted			

Consequences Under Major Earthquake

Casualty Risks	Chance of Post-EQ Placard	Expected Building Downtime	Initial Building Cost	Repair Cost	Carbon Impacts of Repairs
					
					
					
					
					

Earthquake damage varies depending on the level of shaking experienced and characteristics of the building's structure and other systems. Design choices affect the amount and types of likely damage.

* Includes Risk Category IV and other buildings with enhanced seismic resistance features.

** Some retrofitted buildings can experience much less damage.

New code-compliant buildings have very low risks of casualties in the US. Some older buildings have high safety risks.

Design choices affect the odds of a green tag (no restrictions), yellow tag (restricted entry), or red tag (unsafe, no entry).

Design choices affect the amount of time required before a building can be occupied after an earthquake.

More resilient buildings typically cost slightly more upfront, but result in lower post-earthquake repair costs and consequences.

Building materials require energy to produce. The amount and types of repairs required affect carbon releases and energy usage.