Chapter 5
Buildings

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Reliability vs. Resiliency

Safe ≠ Usable

Photo courtesy of Degenkolb Engineers

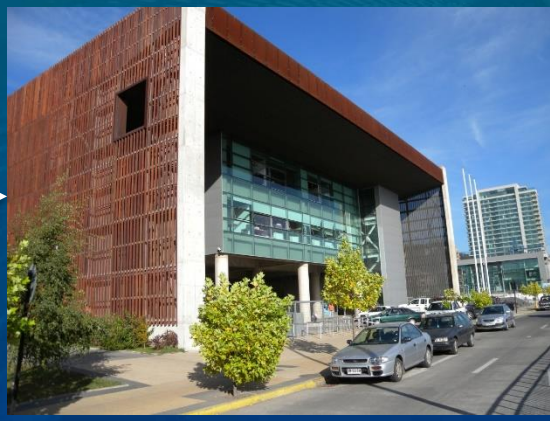

Photo courtesy of AECOM

Example Performance Matrix

Functional Category: Cluster	Expected Hazard Level								
	Phase 1 – Short-Term			Phase 2 -- Intermediate			Phase 3 – Long-Term		
	Days			Wks			Mos		
	0	1	1-3	1-4	4-8	8-12	4	4-24	24+
Critical Facilities									
Emergency Operation Centers	90%							X	
First Responder Facilities	90%							X	
Acute Care Hospitals	90%							X	
Non-ambulatory Occupants (prisons, nursing homes, etc.)	90%							X	
Emergency Housing									
Temporary Emergency Shelters	30%	90%							X
Single and Multi-family Housing (Shelter in place)	60%			90%					X
Housing/Neighborhoods									
Critical Retail		30%	60%	90%					X
Religious and Spiritual Centers			30%	60%	90%				X
Single and Multi-family Housing (Full Function)			30%		60%		90%		X
Schools			30%	60%	90%				X
Hotels & Motels			30%		60%	90%			X
Community Recovery									
Businesses - Manufacturing				30%	60%	90%			X
Businesses - Commodity Services				30%	60%		90%		X
Businesses - Service Professions				30%		60%		90%	X
Conference & Event Venues				30%		60%		90%	X

Building Performance Levels

A – Safe & Operational



B – Safe & Usable During Repair

Photos courtesy of Degenkolb Engineers

C – Safe & Not Usable

D – Unsafe

Photo courtesy of AECOM

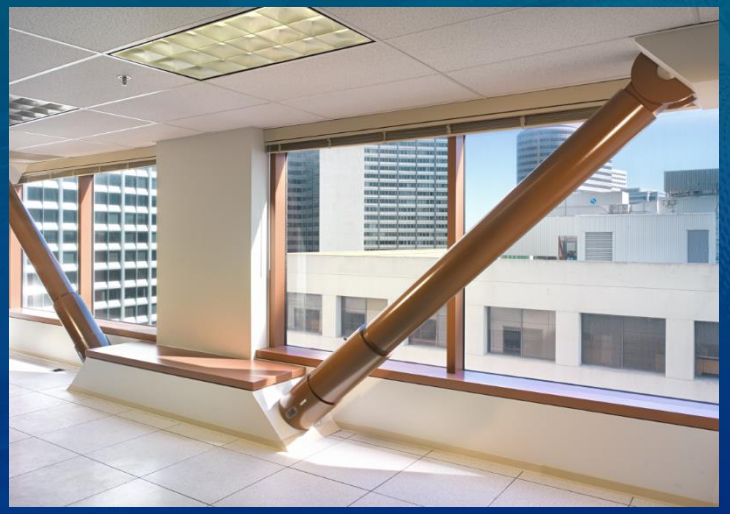
Interdependencies

- Power and water critical
- Most buildings need people to make them functional (i.e. the workers) – they must be able to get to the building
- Adjacent buildings can pose hazards

Photos courtesy of Degenkolb Engineers

New Buildings

- Current standards do not explicitly deal with function protection for every hazard
- Code architectural, structural, mechanical requirements are sometimes not in alignment
- New building standards are easier to change than existing building requirements



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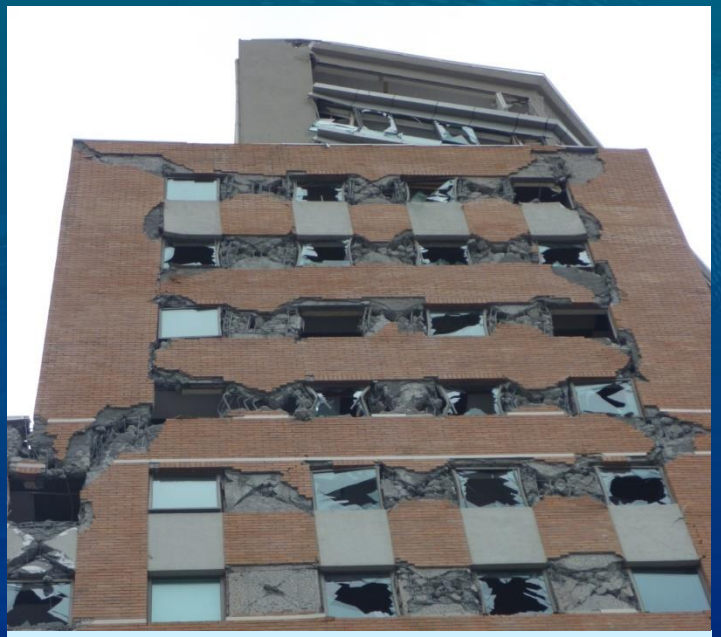
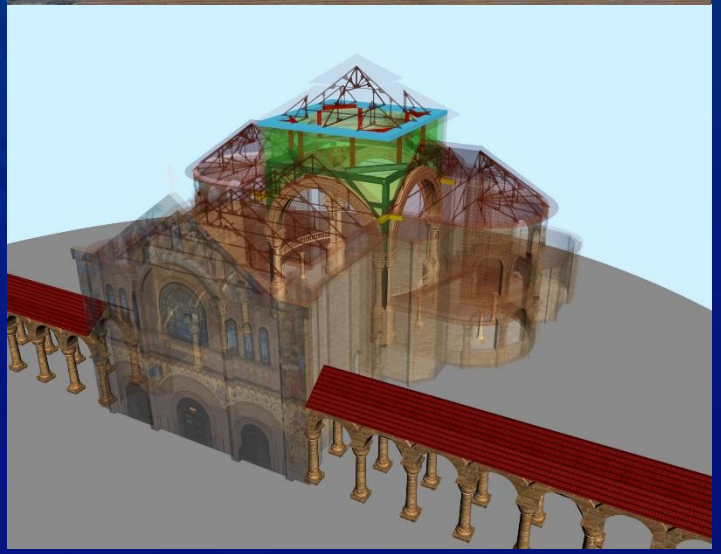
Existing Buildings

- Codes, standards, and building practice constantly evolving
- Structural Standards are typically not retroactive
- Retrofit often costly and disruptive





Photos courtesy of Degenkolb Engineers

Strategies

- Local communities can tailor to their hazards and resilience desires
- Provide power and water self-sufficiency
- Prioritize what buildings are critical
- Balance mandatory, triggered, and voluntary upgrades

Photo courtesy of Degenkolb Engineers

Breakout Discussion Topics

- What are your experiences with building vulnerabilities that affect resilience?
- Are there elements within the building sector that have been overlooked in the framework?
- How can interdependences between critical buildings and other infrastructure be addressed?
- Can the recommendations in this chapter be implemented? If not, what changes are needed?