



Safety in Buildings

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Public duty for safety

Duty of professionals (engineers, architects, contractors, inspectors, approval authorities) to ensure public safety

Included in PEC and PCATP codes of conduct

Licensing systems needs to be

strengthened

Professionals must be sued and

prosecuted



Code of Hammurabi

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"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has"
Margaret Mead



If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death

If it kill the son of the owner the son of that builder shall be put to death

If it kill a slave of the owner, then he shall pay slave for slave to the owner of the house



Code of Hammurabi

If it ruin goods, he shall make compensation for all that has been



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ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means.

If a builder build a house for some one, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means.

Seismic safety

Major urban areas of Pakistan fall in hazard

Zones-2B, -3, and -4 (UBC, USA)

Building regulations exist, but enforcement is



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very lax (noora-kushti)

Original structural designs vetted by proof-engineers but most builders deviate

26 high-rises along Sharah-e-Faisal declared “potentially dangerous” by KBCA (1998)

Earthquakes do not kill people --- falling buildings do!

Over the past eight years in Asia, the major seismic calamities include:



<u>Year</u>	<u>Location</u>	<u>Collapsed buildings</u>	<u>Killed</u>	<u>Homeless</u>
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1999	Izmit, Turkey	100,000	19,000	600,000
2001	Gujarat, India	100,000	20,000	720,000
2005	N. Areas, Pakistan		70,000	3,300,000

Margalla *Towers*, Islamabad collapsed as it was a dangerously constructed building

Fire safety

Fire resistance of building materials

Compartmentalization to reduce spread of fire

Code-compliant fire-fighting measures



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(especially sprinkler systems in high-rises)

Smoke-evacuation systems (asphyxiation major cause of deaths)

Adequate capacity fire-escape staircases

Fire safety

Provisions for evacuation of the handicapped

Fire-lifts & elevator automatic recall systems

Sensitive & accurate fire-alarm systems

Regular fire-drills for all occupants



Electricity hazards

Fire hazards from small leakages (less than 1 amp), short-circuit not required

Shock hazards from still smaller leakage (less than 0.1 amp)

Use 0.3A or 0.5A RCD for fire-protection & 0.03A RCD for personnel protection

Good housekeeping vital for electrical safety

Building regulations exist, but enforcement is)



Other requirements

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Adequate washrooms & toilet facilities

Proper air circulation

Ample sunlight

Clearances for emergency vehicles

Noise mitigation measures

Safeties in lifts (falling, door interlocks, railings around car roof,



seismic provisions, fire-lift)

Exit signage, gensets, emergency lights



Construction safety

Multiple hazards to workers, inspectors and visitors during

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construction

Fire hazards

Shock hazards owing to rough handling, water presence

Falling hazards due to unguarded edges

Personal safety equipment (helmets, boots, harness, etc)

First aid kits & artificial resuscitation

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