

ARCHITECTS, HOSPITALS AND EARTHQUAKES

SOME ISSUES.....

- THE **COMPLEXITY** OF HOSPITALS
- WHAT THE ARCHITECT **WORRIES** ABOUT
- THE **NONSTRUCTURAL** PROBLEM



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SOME ISSUES.....

COMPLEXITY

a large modern hospital is....

A very upscale residential hotel...

A highly serviced office building(record keeping) ...

An industrial building (,materials processing and distribution, laundry)...

A high-tech laboratory...

A hazardous materials usage and storage facility...

A restaurant...

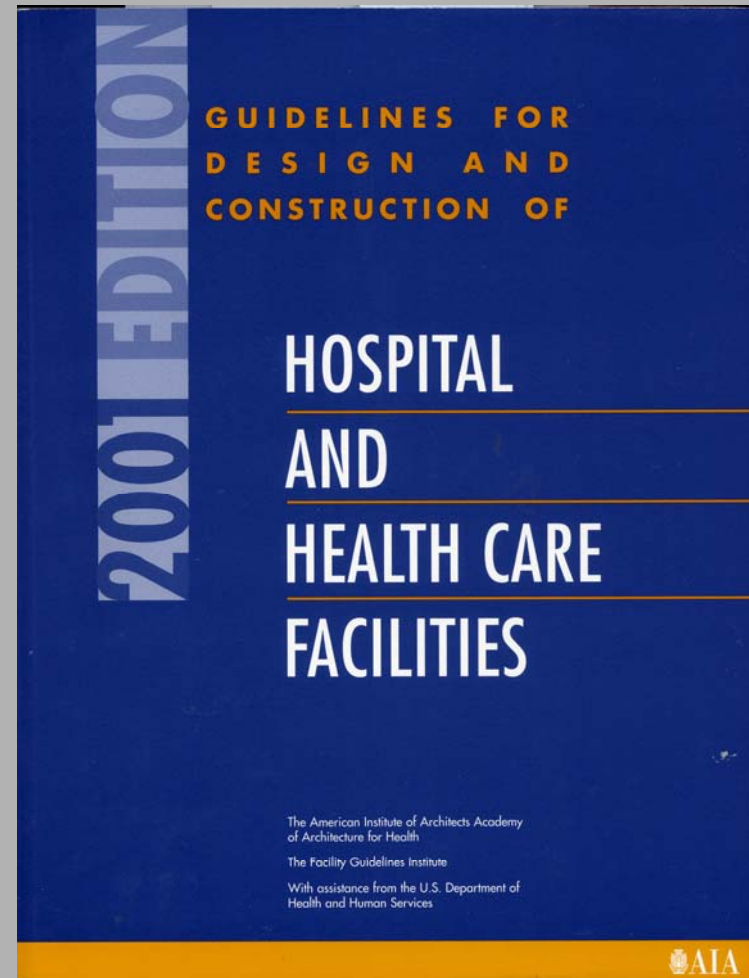
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COMPLEXITY

THE HOSPITAL
ARCHITECTS
BIBLE:
the AIA guidelines



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A typical general hospital has .. about 26 different units , each with its own spatial, environmental and service requirements, each is related to other units , and each has specific vertical and horizontal planning requirements for access by medical, administrative and service staff, visitors and patients

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WORRIES..

Planning ,
function, costs, the physicians, the
administration... but not **seismic**,
because

- the seismic problem is highly regulated and codified, and can be delegated to the engineer.

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The AIA guidelines (177 pages)
devotes **0.50** pages to the seismic
problem:

- ref. to relevant codes, special design of essential systems
- ref. special inspection during construction
- ref. to seismic design for elevators
- ref. to importance factors
- ref.to importance factors for relocatable units

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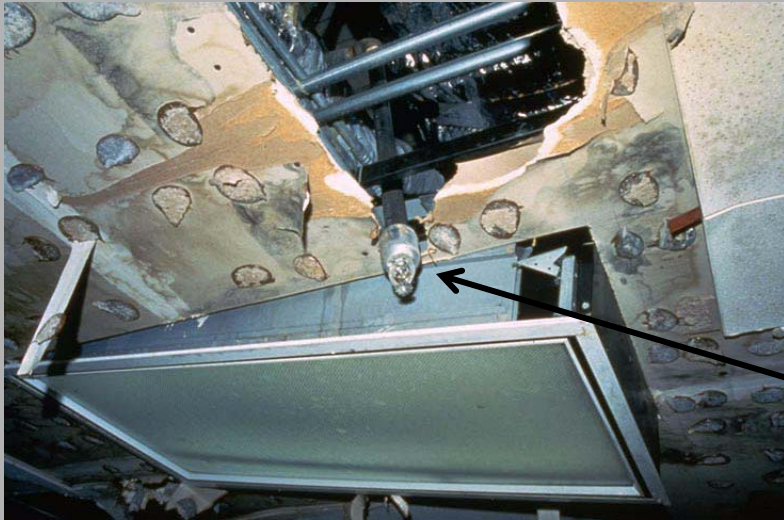
THE NONSTRUCTURAL PROBLEM

modern hospitals in recent earthquakes have been forced to evacuate patients because of isolated failures in nonstructural components even in well designed and constructed facilities in California

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SOME ISSUES.....



LA County Olive View
Medical Center,
Sylmar

replacement hospital
hospital, 1977-1985

This rupture in sprinkler pipe occurred where the drop connected to the lateral run. Elsewhere small-diameter copper piping broke at connections to anchored equipment

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Holy Cross Medical
Center, Mission Hills

replacement hospital,
post-1973

Damage to fan units , ducts and booster pumps in penthouse caused loss of HVAC to entire facility. Also power failure for six hours (**one death**)

Tempoarry closure of facility due to HVAC loss, fullservice s only after 3 1/2 weeks

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“ ..the Hospital Act was very effective in limiting structural damage: to a lesser extent the Act was also effective in controlling nonstructural damage. The fact that two of the largest and newest facilities in the San Fernando Valley were effectively shut down for the week of the earthquake by nonstructural damage is troubling and raises issues about whether the Act’s aim to provide functional hospitals has been met”.

CA State Seismic Safety Commission

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SOME ISSUES.....

- **Hospital construction in California (including nonstructural) is well regulated and inspected**
- Building industry is not capable of constructing fail-safe facilities under current methods and budgets
- Elsewhere in the country standards are lower, and there are large issues as to roles and responsibilities for nonstructural design , approval and installation
- Field Act shows that key to good seismic performance is knowledgeable plan checking and inspection, but hospitals much more complex than schools

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