

# Basic Concepts: Performance-based Earthquake Engineering

## Seismic Performance -- Some questions to consider

- ✓ What are our goals?
- ✓ What are suitable frameworks for expressing performance goals
  - ◆ Conceptual -- from the owners/clients perspective
  - ◆ Quantitative --from the engineer's perspective
- ✓ Performance Metrics vs. Engineering Response Parameters
- ✓ Nonlinear response - Is it a desirable feature or a problem to overcome?
- ✓ Having set our goals, how do we achieve them?

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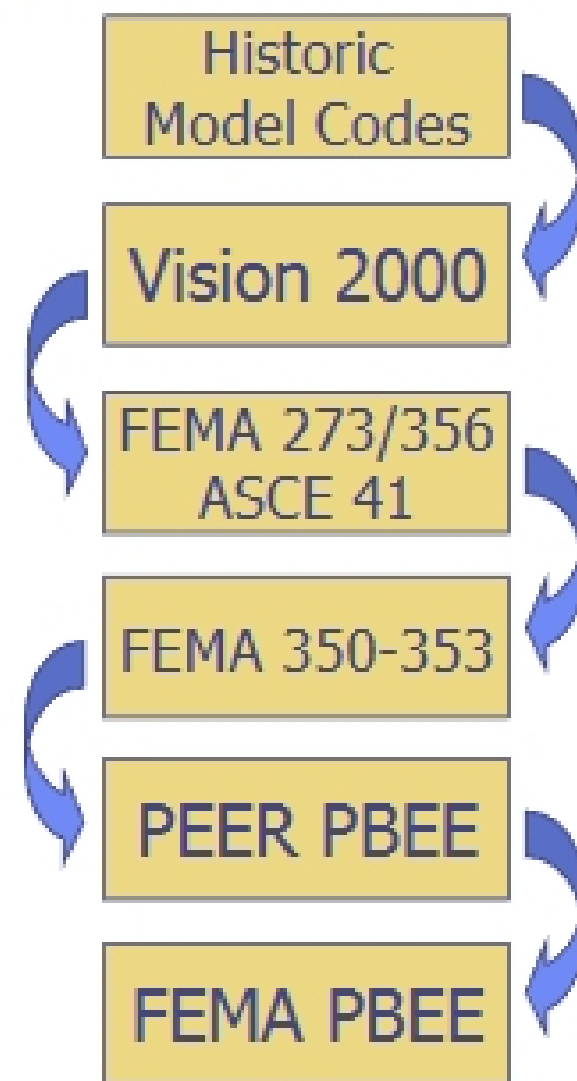


# Goals: Our Performance Expectations?

## Different approaches

- ❖ Current codes - What are their stated objectives?
- ❖ Ideal situation - A simple limit states framework for design.
- ❖ Current directions - Vision 2000 (SEAOC), SAC LRFD approach, etc.
- ❖ Future directions - reliability-based approaches, PEER performance-based evaluation strategy, FEMA/ATC-58

## References



# References: Performance-Based Design Codes

- ❖ Hamburger, R.O., Performance-Based Analysis and Design Procedure for Moment Resisting Steel Frames, Background Document, SAC Steel Project, Sept. 1998.
- ❖ SEAOC, Vision 2000: Performance Based Seismic Engineering of Buildings, San Francisco, April 1995.
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- ❖ FEMA, Guidelines for Seismic Rehabilitation of Buildings, Vol. 1: Guidelines, FEMA 356, Washington DC, 2002 (formerly FEMA 273).
- ❖ Earthquake Engineering Research Center, Performance-based Seismic Design of Buildings: An Action Plan , U.C., Berkeley, 1995.
- ❖ FEMA/EERI, Action Plan for Performance -Based Seismic Design, FEMA 349, Washington DC, 2000.
- ❖ ATC, Development of Performance-based Earthquake Design Guidelines, ATC-58, Redwood City, 2002.

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