



100th Anniversary Earthquake Conference
COMMEMORATING THE
1906 SAN FRANCISCO EARTHQUAKE
APRIL 18-22, 2006 | THE MOSCONE CENTER

Tutorial: State of the Art Technologies

Proposed Improvements to U.S. Design Provisions

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SEAONC Protective Systems Committee Charges

- Building Code Improvements
- Education of Engineers, Architects, and Owners
- Development of the Next Generation of Isolation Design Provisions



Background of Base Isolation Code Provisions

- Isolation introduced to US 20 years ago
- Original code well written and appropriately conservative for a new technology



Background of Base Isolation Code Provisions

- Isolation technology has evolved over time
- Code has not changed appreciably over this time
- Code should be updated to reflect the current maturity of the technology



Building Code Provisions

- Design Provisions
- Design Review Provisions
- Testing Provisions



Design Provisions



Design Provisions: Lower Ductility Structural Systems

- Code requires use of high-ductility lateral systems on isolation
- Isolation reduces ductility demand on structures
- Implies that a higher performance level is required for isolated structures



Design Provisions: Lower Ductility Structural Systems

- Suggest permitting lower ductility systems on isolation to allow owner to realize savings by choosing isolation
- Lower ductility system on isolation will still result in less non-structural damage than conventional fixed base structures



Design Review Provisions



Design Review Provisions

- Currently all isolation projects treated equally regardless of:
 - Size/complexity of project
 - Experience of engineer with isolation



Design Review Provisions

- Isolation no longer a “new” technology
- Rational to relax requirements for small/simple projects designed by engineer experienced with isolation



Design Review Provisions

- Relaxing design review will make isolation of small/simple projects more economical and schedule efficient for the owner and therefore more likely to be chosen



Testing Provisions



Testing Provisions: Design Properties

- Code was developed when isolation manufacturers were designing isolators specifically for each new project
- Manufacturers now have databases of results to draw from



Testing Provisions: Design Properties

- Code requires prototype testing before final design of isolation system and structure to define design properties
- In general current practice, prototype testing does not occur until just before production begins
- Design properties are assumed from manufacturer's historical data



Testing Provisions: Design Properties

- Code should reflect current practice
- Current prototype testing is in fact a confirmation of the assumed design properties



Testing Provisions: Similar Units

- Code allows use of similar units in lieu of prototype testing
- Language of similar unit provisions, however, cause it to be rarely used



Testing Provisions: Similar Units

- Isolation technology no longer “new”
- Experience gained by isolator manufacturers should allow a broader definition of similar units



Testing Provisions: Similar Units

- Waiving prototype testing, when it is not needed, will reduce project costs and schedule delays and make isolation a more attractive option for building owners



Conclusions



Conclusions

- Current code written during infancy of isolation technology
- Appropriate to modify code to reflect current experience and knowledge base of engineers and manufacturers



Conclusions

- Suggested changes could reduce cost and schedule requirements of isolated projects
- Lower entry cost for isolation will make it a more attractive option for engineers to suggest and owners to choose



Conclusions

- Isolation technology will continue to improve and evolve
- Code must remain current with latest research/products or it may unintentionally stifle the use of technology that can benefit the built environment



Conclusions

- New ideas are being developed to take the code in a different direction
- Simplified code provisions will make isolation more accessible to engineers and owners

