
René Vignos, SE
SEAONC Protective Systems Committee Chair
Forell/Elsesser Engineers, Inc.
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

- Design 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