

ABSTRACT

Performance-based engineering is a modern approach to the design of buildings that focuses on performance as defined by many different stakeholders instead of strength-based performance as defined by engineers. This thesis examines the subset of performance-based engineering that deals with design for resilience against seismic activity, called Performance-based Earthquake Engineering, or PBEE. PBEE improves design based on the traditional building code in several ways, including: first, it meets the needs of stakeholders other than engineers; second, it explicitly verifies each performance target; and third, it evaluates seismic risk more completely. The common misunderstandings and corresponding key limitations of the building code are first explained. Then, PBEE is introduced, leading to an example-based discussion of how PBEE overcomes the building code limitations.