Seismic Reliability of Two-DegreE-of-Freedom Systems with Supplemental Damping

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Abstract : The seismic reliability of two-degree-of-freedom (2DOF) systems with and without supplemental damping are computed. The used records are scaled from realistic records using standard incremental dynamic Analysis (IDA). The total normalized shear base is computed for both cases using different scaling factors, and it is considered as the demand. The seismic reliability is computed using codified design to stipulate the capacity and, after some assumptions, applying the first-order reliability method (FORM). The 2DOF considered can be thought as structures with non-linear behavior, with and without seismic protection, subjected to earthquake activity in Mexico City. It is found that the reliability of 2DOF structures retrofitted with supplemental damper at its first story is generally higher than the reliability of 2DOF structures without supplemental damping.