

Improving Seismic Performance of Interior Drywall Partitions with a New Sliding Connection

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The use of gypsum wallboard and cold-formed lightweight steel studs has been the preferred method of construction for interior partitions in commercial buildings for over 40 years. Unfortunately, when subjected to seismic loading they are characterized by a poor seismic performance. In particular, drywall partitions exhibit initial levels of damage requiring repairs at very low levels of lateral deformation such as interstory drift ratios as small as 0.1% or 0.2%. Since the probability of occurrence of these low levels of deformation in buildings located in regions of moderate and high seismicity is relatively high, this leads to significant disruptions and economic losses to owners, insurers and other stakeholders. This presentation will summarize more than 30 years of experimental testing of interior partitions in 12 different investigations and present fragility functions developed by the authors to estimate seismic performance as a function of interstory drift ratio. The presentation will also summarize the development and testing of a new frictional/sliding connection aimed at significantly improving the seismic performance of interior partitions. Two full-scale specimens were recently tested at Stanford, one using conventional method of construction and the other with the proposed sliding connection. While the conventional construction specimen exhibited the first visible damage at an interstory drift ratio of 0.1%, the specimen with the sliding connection was damage free at interstory drift ratios as high as 1.6%.