

## Hybrid earthquake response simulations of a full scale 3-story steel frame using buckling-restrained braces

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### SUMMARY

A 3-story full-scale buckling-restrained braced frame (BRBF) specimen was tested using pseudo-dynamic testing procedures at NCREC in 2010. This BRBF specimen adopted two newly developed buckling-restrained braces (BRBs) including the thin profile and end-slotted BRBs. The 10/50 LA03 earthquake with a peak ground acceleration of 530gal was applied for two hybrid tests. During the tests, the inter-story drifts reached about 0.03 radians for the 1st and 2nd stories. One of the thin BRB steel casings in the 1st story local bulged out in the first hybrid test. In the second hybrid test, the 1st story BRB specimens were replaced with new ones using thicker steel tubes. It is illustrated that the local bulging failure of the steel casing can be prevented if the steel casing is properly designed using the proposed method. This paper presents the BRBF experimental responses and concludes with the seismic design recommendations for the thin-profile BRB to prevent the local bulging failure.