



## Expanding wood use towards 2025: seismic performance of braced mass timber frames, year 2

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Abstract: Braced timber frames (BTFs) are one of the most efficient structural systems to resist lateral loads induced by earthquakes or high winds. Although BTFs are implemented as a system in the National Building Code of Canada (NBCC), no design guidelines currently exist in CSA O86. That not only leaves these efficient systems out of reach of designers, but also puts them in danger of being eliminated from NBCC. The main objective of this project is to generate the technical information needed for development of design guidelines for BTFs as a lateral load resisting system in CSA O86. The seismic performance of 30 BTFs with riveted connections was studied last year by conducting nonlinear dynamic analysis; and also 15 glulam brace specimens using bolted connections were tested under cyclic loading.

In the second year of the project, a relationship between the connection and system ductility of BTFs was derived based on engineering principles. The proposed relationship was verified against the nonlinear pushover analysis results of single- and multi-storey BTFs with various building heights. The influence of the connection ductility, the stiffness ratio, and the number of tiers and storeys on the system ductility of BTFs was investigated using the verified relationship. The minimum connection ductility for different categories (moderately ductile and limited ductility) of BTFs was estimated.

### Documents

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