EXPERIMENTAL INVESTIGATION OF GROUP ACTION FACTOR FOR BOLTED WOOD CONNECTIONS

by

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(ABSTRACT)

This thesis presents the results of testing to determine the significance of the group action factor at the 5% offset yield and capacity of single-shear bolted wood connections loaded parallel to grain. The single and multiple-bolt connections tested represent common connection geometries used in wood construction in the United States. The results of both monotonic and cyclic loading of connections are presented.

Monotonic test data was used to determine an appropriately scaled CUREE Displacement Controlled Quasi-Static Cyclic Protocol. Overall, one hundred and eighty connections were tested using this cyclic protocol based on data obtained from thirty-three monotonic tests.

Tested assemblies had geometric variables that include number of bolts per row, number of rows, bolt diameter, and side member material. In addition, the main and side member material and thickness were designed to produce three of the four major connection yield modes as defined by the 1997 National Design Specification for Wood Construction (AF&PA, 1997).

Results from this research address the need for adequate spacing of bolts in a row to control the brittle connection behavior that directly affected the group action factor at capacity.

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