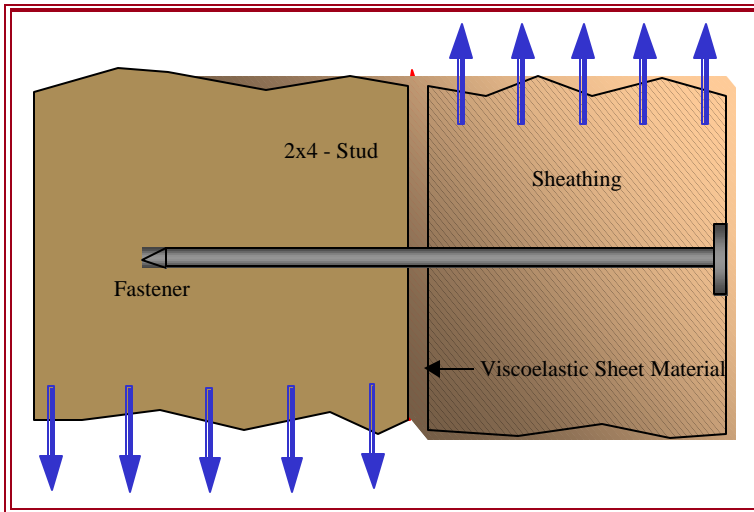


EXPERIMENTAL INVESTIGATIONS OF WOOD CONNECTIONS: THE EFFECT OF MOISTURE CONTENT AND VISCOELASTIC MATERIAL ON STIFFNESS AND ENERGY DISSIPATION

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The objective of this connection research is to characterize the stiffness and energy dissipation characteristics of wood sheathing to stud connections. Two primary studies have been undertaken to date. The first investigated the use of thin layers of Viscoelastic (VE) material bonded between the sheathing and stud, as shown in the figure. The second, which started in Fall 2002, is investigating the effects that moisture content has on the structural properties of conventional and VE connections.

VE material is self-adhesive and comes in rolls (similar to tape). The material is readily available, very flexible, easy to apply, and can be layered. The results of one preliminary full-scale test of one thin layer (0.005") of the material applied to a wall show that significant improvements can be realized without affecting the overall wall dimensions. Innovative applications of VE sheet material may potentially have a profound impact on the design, construction and rehabilitation of wood frame structures.

The research program will test and evaluate the application of VE material in wood frame structures, typical of residential housing, for improving the seismic performance and durability of the structure. An experimental program has been proposed to evaluate the application of VE material to wood frame construction at the connection level. CASHEW, a multi degree-of-freedom non-linear model will be used to conduct parametric studies to predict full-scale wall behavior based on connection test results, and to optimize the placement of the VE material within the wall. Limited full-scale testing will be conducted to verify analytical results.