

In-Plane Loading of Brick Veneer over Wood Shear Walls

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Abstract:

Per current design codes and construction practices, a wood shear wall attached to the brick veneer must be designed to resist the entire in-plane shear load. This is based on the assumption that the ties between the wood shear wall and the brick veneer are flexible enough to prevent load transfer to the stiffer brick veneer. This study provides an analytical method to predict the amount of load transferred through the ties to the brick veneer. The approach used consists of modeling the rows of ties as springs that transfer the in-plane load to the attached brick wythe. The results of this study show that the amount of in-plane load transferred by the ties can significantly affect the design, and can activate unintended failure modes. This study also provides a method to calculate the in-plane deflection of a wood shear wall with brick veneer as well as related failure modes. A design method to eliminate the failure modes of sliding and overturning of the veneer in order to increase the total in-plane shear capacity of the wall is also presented.

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