

## **SHEAR WALL LUMBER FRAMING: DOUBLE 2X'S VS. SINGLE 3X'S AT ADJOINING PANEL EDGES**

After the 1994 Northridge earthquake, model codes began requiring 3x lumber framing at adjoining panel edges in higher seismic zones for shear walls with an allowable capacity greater than 350 plf. The 3x lumber framing requirement provides a larger surface for nailing than does a single 2x, helps prevent splitting of the framing, and allows for increased edge distances in both the wood structural panels and the wood framing. Two 2x's stitch-nailed together provide the nailing surface benefits of the single 3x and are often easier to obtain.

In a study by APA, the use of double 2x's at adjacent panel edges was compared to single 3x's in shear walls. The double 2x's were stitch-nailed together based on an engineered connection design to transfer the design shear from one 2x to the next. Results from cyclic shear wall testing show that shear walls with double 2x's stitch-nailed together perform about the same as those with a single 3x by all measures.

Other engineered wood connection designs per the National Design Specification for Wood Construction (NDS) to connect double 2x framing would be expected to perform similarly. However, a bolted connection would be expected to have more slip than a nailed or lag screw connection, since bolt holes are typically slightly over-sized to facilitate installation.

A proposal has been submitted for the International Building Code to permit a double 2x, engineered to transfer the design shear, to be used in lieu of a single 3x at adjoining panel edges.

### **References**

APA. 2003. Shear Wall Lumber Framing: Double 2x's vs. Single 3x's at Adjoining Panel Edges. APA Report T2003-22. APA – The Engineered Wood Association. Tacoma, WA.

NDS, 2001. National Design Specification for Wood Construction. American Forest and Paper Association, Washington, D.C.

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