



Effect of Round Holes in High Shear Zones of Laminated Veneer Lumber

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Summary:

The purpose of this study was to experimentally and numerically explore the effect of drilled holes in high shear zones of Laminated Veneer Lumber (LVL) beams. A total of 15 full-size shear beam tests were performed on nominal 2x10 1.9E Eastern Species LVL specimens with a span of 1829mm. Three different hole diameters were investigated: 44mm, 70mm, and 92mm drilled at quarter span and mid-depth of the beams. A finite element analysis, coupled with the Tsai-Wu strength theory, was carried out on the same beam configurations to investigate the stress distribution around the holes. It was clear from the stress contour maps that the holes disturb the flow of normal and shear stresses in such a way as to develop significant tensile stresses perpendicular to the grain at specific locations around the hole periphery. The transverse tensile stresses lead to relatively consistent failure loads for the LVL due to the lack of cross plies.

Online Access: Free

Resource Link

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