

Study on the Impact of Size and Position of the Shear Field in Determining the Shear Modulus of Glulam Beam Using Photogrammetry Approach

Authors : Niaz Gharavi, Hexin Zhang

Abstract : The shear modulus of a timber beam can be determined using torsion test or shear field test method. The shear field test method is based on shear distortion measurement of the beam at the zone with the constant transverse load in the standardized four-point bending test. The current code of practice advises using two metallic arms act as an instrument to measure the diagonal displacement of the constructing square. The size and the position of the constructing square might influence the shear modulus determination. This study aimed to investigate the size and the position effect of the square in the shear field test method. A binocular stereo vision system has been employed to determine the 3D displacement of a grid of target points. Six glue laminated beams were produced and tested. Analysis of Variance (ANOVA) was performed on the acquired data to evaluate the significance of the size effect and the position effect of the square. The results have shown that the size of the square has a noticeable influence on the value of shear modulus, while, the position of the square within the area with the constant shear force does not affect the measured mean shear modulus.

Keywords : shear field test method, structural-sized test, shear modulus of Glulam beam, photogrammetry approach

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