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Development of a Shear Testing Method for Full-sized Structural Lumber

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Abstract: An asymmetric four-point-bending type shear test was developed to evaluate the shear strength of full-sized structural lumber. Medium dimension glulam made of sugi (*Cryptomeria japonica* D. Don) from Miyazaki prefecture was tested to confirm applicability of this testing method. Results obtained are summarized as follows :

1)It was found that partial compressive deformation at loading points prevented full-sized structural lumber from shear fracture when the shear strength of sugi specimens with low density grown in Miyazaki prefecture was evaluated by the three-point-bending type shear test.

2)Every glulam specimen tested by the asymmetric four-point-bending type shear test fractured neither by bending stress nor by partial compressive stress perpendicular to grain, but by shear stress. It was confirmed that using saddle-type steel jigs attached with lag screws was very effective in inhibiting partial compressive deformation at loading and supporting points.

3)The necessary number of lag screws could be estimated from the expression including shear stress, bending stress and partial compressive stress perpendicular to grain at loading and supporting points.

4)The average shear strength of medium dimension sugi glulam was 8.0 N/mm^2. This value was larger than the one obtained by the three-point-bending type shear test.

Keywords: shear strength, testing method, full-sized structural lumber, sugi

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