

## Conclusion

Three-layer CLST<sup>®</sup> manufactured with 1.55E LSL for Lignor Ltd., was evaluated through flatwise bending and shear testing. Mechanical properties for comparison to the predicted values determined using the shear-analogy methodology in ANSI/APA PRG 320.

In all cases, the value for the comparison must equal or exceed the predicted values determined using the shear analogy methodology in PRG 320 for the CLST<sup>®</sup> met performance requirements.



Structural, Civil and Forensic Engineering Services

### Conclusion

Testing shows that Lignor's CLST<sup>®</sup> produced with 1.55E LSL commercially produced material, is a superior choice for building construction. The higher bending stress and stiffness values allow higher load capacities, longer spans and/or reduced panel thicknesses than the other CLT products identified. It should be noted that while it is as much as three times stronger in bending than the CLT products in the major strength direction, it is 4 to 5 times stronger in bending in the minor strength direction. This is a significant advantage when using these panels in two-way floor/roof plate construction.

Sincerely,

Thomas D. Rines, PE, SE  
Principal Partner

### Professional Certification:

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

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Table 2: ASD Design Capacity: Tested vs. Predicted								
Supplier	Major Axis Direction				Minor Axis Direction			
	(FbS) <sub>0</sub> <sup>(b)</sup>	(EI) <sub>0,app</sub> <sup>(c)</sup>	(GA) <sub>0</sub> <sup>(c)</sup>	vs, <sub>0</sub> <sup>(b)</sup>	(FbS) <sub>90</sub> <sup>(b)</sup>	(EI) <sub>90,app</sub> <sup>(c)</sup>	(GA) <sub>90</sub> <sup>(c)</sup>	vs, <sub>90</sub> <sup>(b)</sup>
	lbf-ft./ft. of width	10 <sup>6</sup> lbf-in. <sup>2</sup> /ft. of width	10 <sup>6</sup> lbf/ft. of width	lbf/ft. of width	lbf-ft./ft. of width	10 <sup>6</sup> lbf-in. <sup>2</sup> /ft. of width	10 <sup>6</sup> lbf/ft. of width	lbf/ft. of width
Lignor 3-Layer CLST <sup>®</sup>	4,762	68	1.98	7,543	868	9.3	0.50	2,026
Predicted Values <sup>(a)</sup>	4,300	62	0.49	1,390	615	2.6	0.50	475
<b>Difference</b>	<b>111%</b>	<b>110%</b>	<b>404%</b>	<b>543%</b>	<b>141%</b>	<b>358%</b>	<b>100%</b>	<b>427%</b>

(a) The predicted ASD design capacities were derived using the shear-analogy methodology in Appendix X3 of ANSI/APAPRG 320.

(b) The ASD comparison values for bending strength and shear capacity are the characteristic values from testing divided by 2.1 per PRG 320 sections 8.5.3.2 (bending) and 8.5.4.2 (shear).

(c) The ASD comparison values for bending and shear stiffness are simply the mean values from testing per PRG 320 sections 8.5.3.2 (bending) and 8.5.4.2 (shear).