February 23, 2012

Mr. Bob Maslowski
Project Coordinator
Structurlam Products Ltd.
2176 Government St.
Penticton, BC V2A 8B5

Dear Mr. Maslowski:

We recently conducted testing on three glulam specimens reinforced with rebar. To briefly summarize the test specimens:

1) One 5/8-inch diameter rebar was inserted into the mid-width of 5-1/8-inch wide x 12-inch deep x 12-inch long glulam section,
2) The rebar was epoxy bonded into a 3/4-inch diameter hole predrilled into the glulam,
3) Only 10 inches of the rebar was epoxy bonded within the predrilled hole,
4) The rebar was connected to 5/8-inch diameter threaded rod, which extended out the top of the glulam approximately 6 inches (see Figure 1).

The specimens were tested in tension, generally following Section D-4 of *AITC 404-92 Standard For Radially Reinforcing Curved Glued Laminated Timber Members to Resist Radial Tension*. The universal test machine had a cross head speed set to 0.05 inch per minute. The overall test setup is shown in Figure 2. The universal test machine has a square hole with the minimum dimension of 3-1/2 inches, thus providing sufficient clearance around the reinforced hole as to not interfere with the test. A coupler nut was joined between the threads protruding from the glulam and a length of threaded rod that was connected to the top load head of the universal test machine. The rod was pulled from the glulam in tension with the glulam bearing on the bottom load head of the universal test machine. The results are summarized in Table 1.

Table 1: 5/8-inch-diameter rebar reinforcement withdrawal tests.

Specimen	Failure Time (mm:ss)	Peak Withdrawal Load (lbf)	Moisture Content (%)	Specific Gravity[(1)]	Failure Mode and Comments
1	11:10	15,091	11.2	0.48	Weld failure between rebar and threaded rod (Figure 3)
2	8:46	15,746	11.7	0.47	Weld failure between rebar and threaded rod (Figure 3)
3	10:15	16,620	12.0	0.49	Coupler nut failure in net facture (Figure 4). This specimen was retested to failure with a second coupler nut, resulting in rebar withdrawal failure at a lower load of 16,043 lbf.

(1) Based on oven dry weight and volume.

Please advise if we can be of any more assistance.

Sincerely,

Thomas D. Skaggs

THOMAS D. SKAGGS, Ph.D., P.E.
Manager, Product Evaluation
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Figure 1: Glulam test specimens with threaded rod exposed.

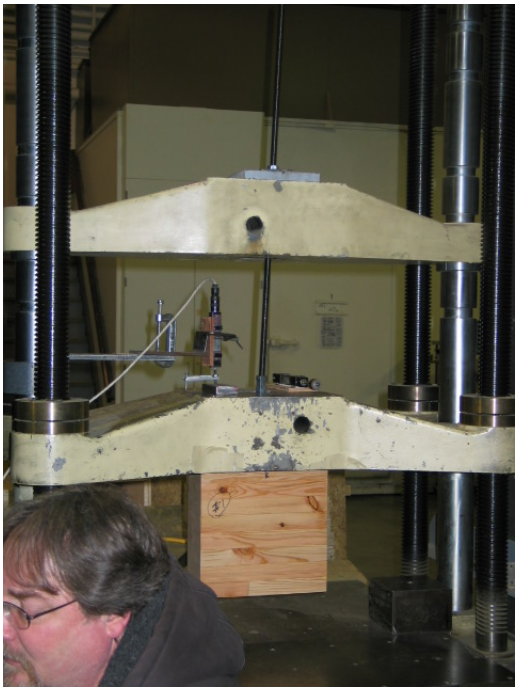

Figure 2: Overall test setup, threaded rod extends through square hole in bottom load head.

Figure 3: Weld failure between rebar and threaded rod.

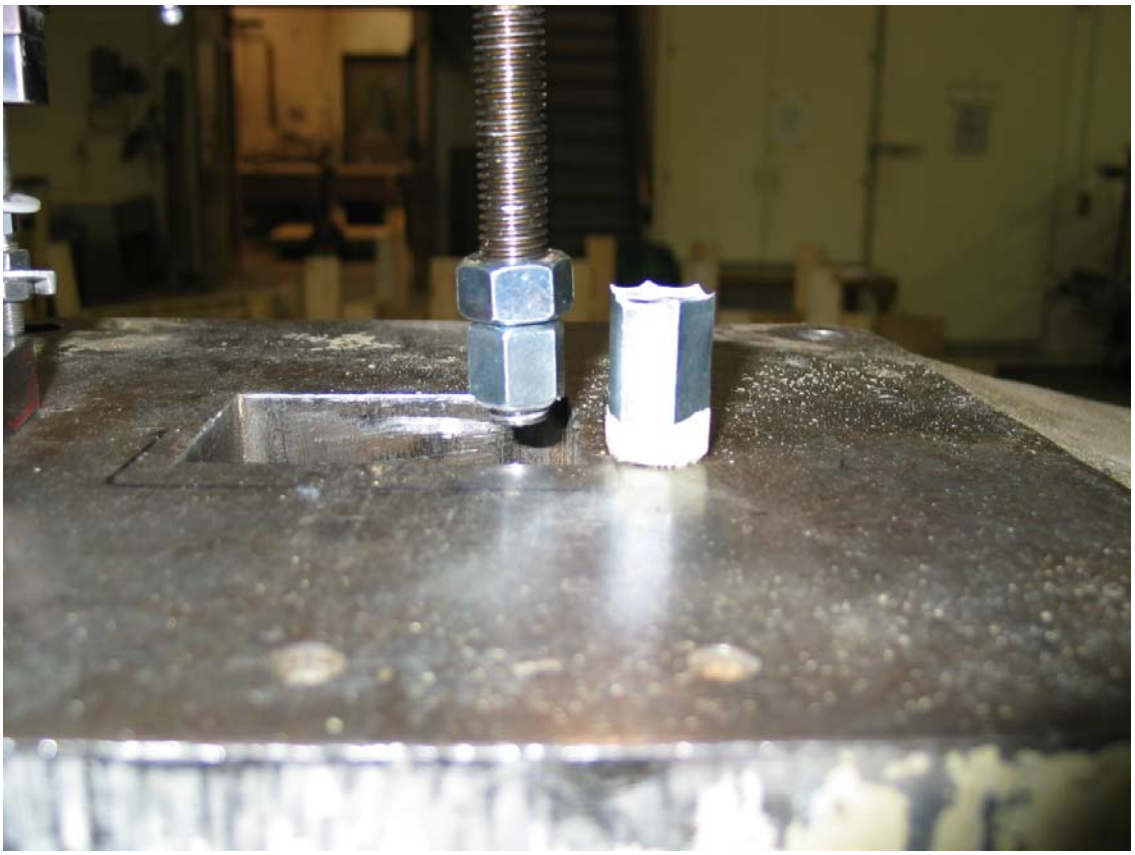

Figure 4: Couple nut fracture.