BCD, LLC

Building Component Development

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Licensed Manufacturing Distributor for

HUSHFRAME® Raft® Connectors

April 2, 2018

To Whom it might concern:

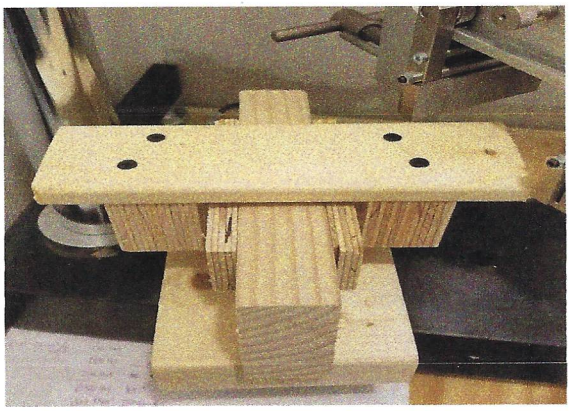
Re:
Structural Shear Test of HushFrame 300 series Raft connectors conducted Saturday, March 30, 2018 at the BCD manufacturing facility at 55 Woodrock Rd., E. Weymouth, MA.

Testing performed by Alan Case, manager, witnessed by Stephen Smith, manufacturing technician, and run on a Test Resources model 140 Dual Column test machine. The machine was calibrated for zero tolerances prior to conducting the tests.

The rafts consist of two opposing plywood mounts sandwiched in place via a silicone rubber core that extends into dovetailed cannels in the mount faces. The plywood is manufactured from farm raised pine and exterior exposure water resistant glue. The rubber cores are room temperature vulcanizing pure silicone exhibiting a Shore A durometer hardness of 25 points.

Twenty sample rafts were selected at random from inventory that had been produced in the previous thirty days and all samples had been allowed to cure for a minimum of seven days prior to testing.

The sample rafts were mounted as opposing pairs on the sides of a section of common 2x4 framing stock which in turn was fastened to a section of framing lumber securely clamped to the test machine base plate. Each raft was secured with two 1-1/4" bugle-head screws. A section of common 1x3 spruce furring was fastened to the furring mount block of each raft utilizing two 1-1/4" bugle-head screws. The furring was then clamped to the actuator of the of the machine and testing commenced.

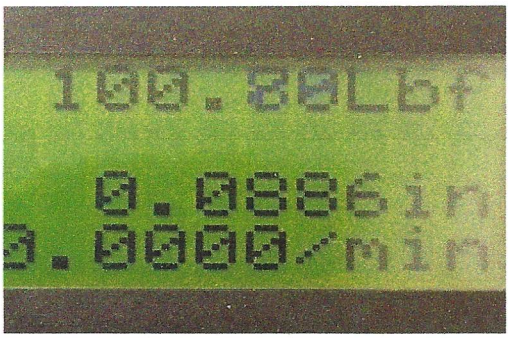


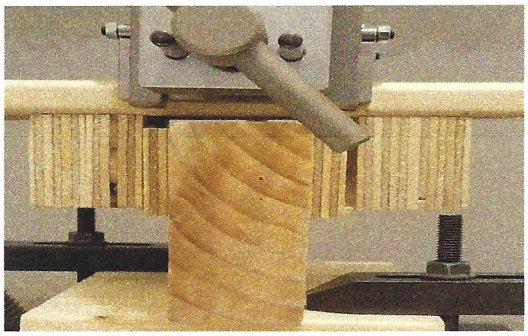
Each pair of rafts was subjected to tension loading and measurement recording beginning with 100 lbs. and increased by 50 lb. increments to 300 lbs. of tension load. Photographs were taken to supplement the visual observations of the tests. The pairs were then loaded to failure to reveal a yield point and cause.

Proudly made in the USA

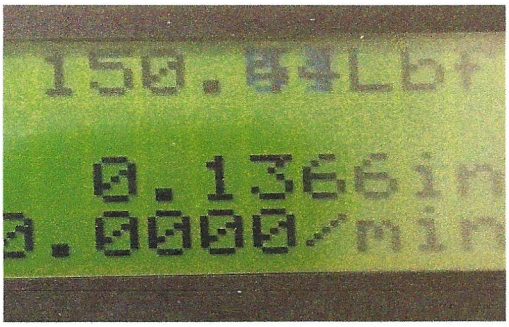
Screen Grabs of typical test series.

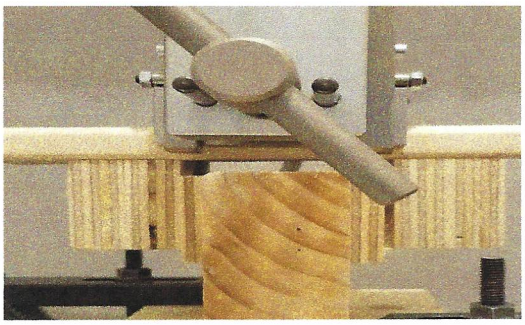
Corresponding photos



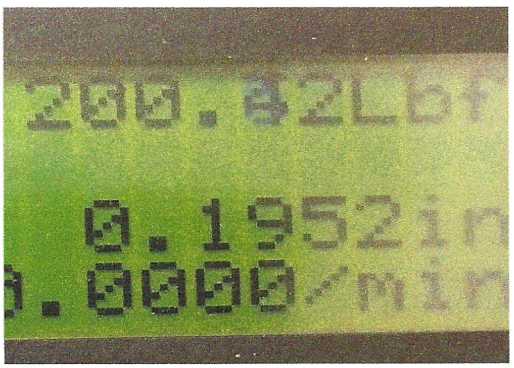


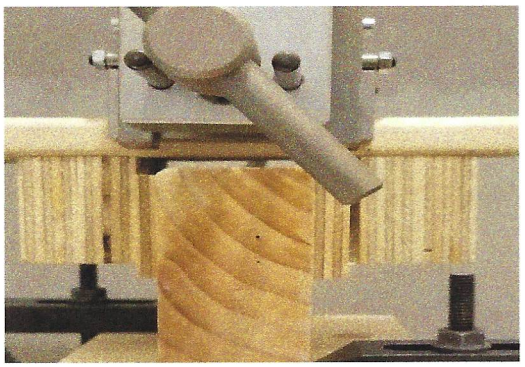
At 100 lbs. of load (50 lbs. per raft) silicone core elongation of up to 1/16" was observed. No yield occurred.



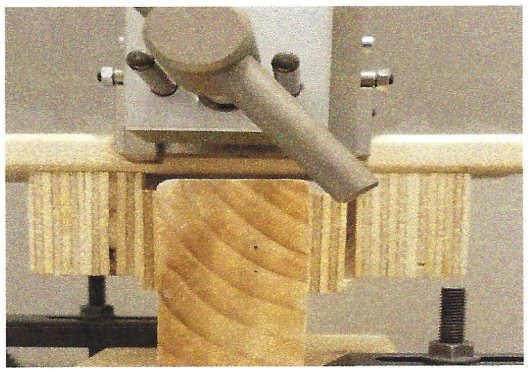


At 150 lbs. of load (75 lbs. per raft) silicone core elongation of up to 1/8" was observed. No yield occurred.

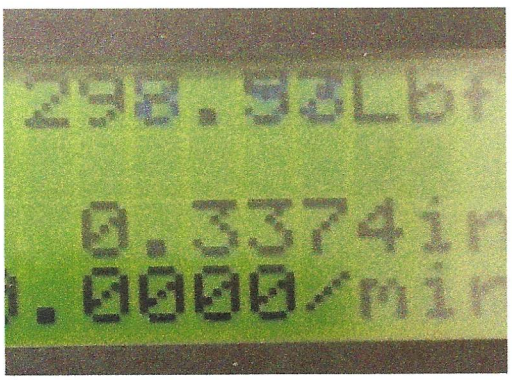


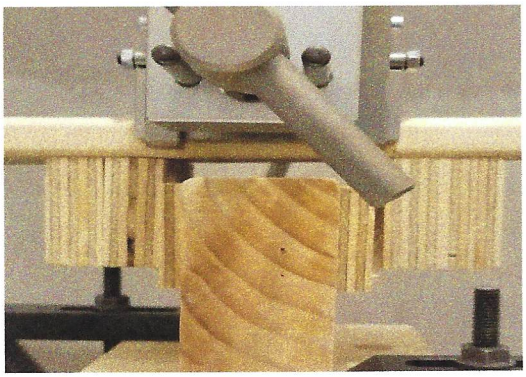


At 200 lbs. of load (100 lbs. per raft) silicone core elongation of up to 3/16" was observed. No yield occurred.



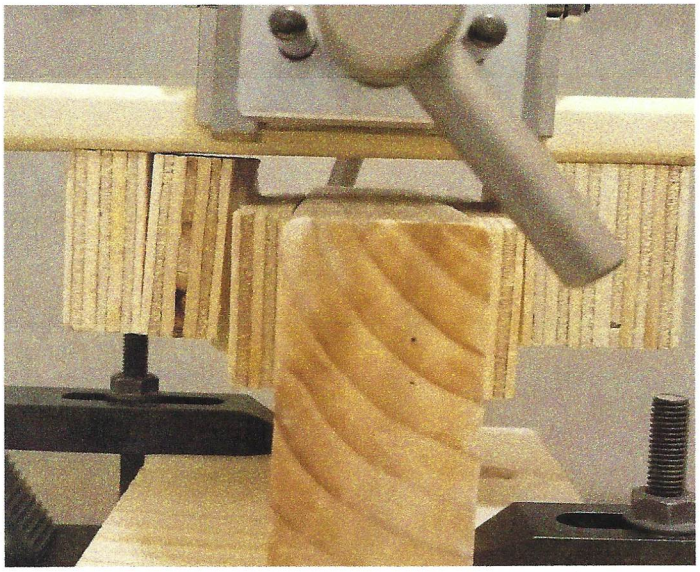
At 250 lbs. of load (125 lbs. per raft) silicone core elongation of up to 1/4" was observed. No yield occurred.

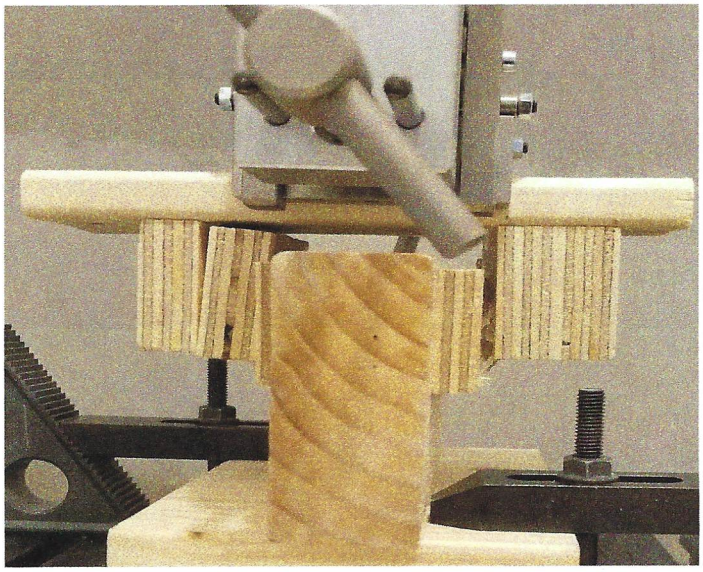




At 300 lbs. of load (150 lbs. per raft) silicone core elongation of up to 5/16" was observed. No yield occurred. Evidence of slight lamination separation from fastener screw pull at left raft furring mount block.

Progressive view of damage to left raft furring mount block at 350+ lbs. tension loading.





The tests were terminated when one of the rafts in each of the paired sets either yielded along the plane of silicone or the fasteners separated from the furring mount block. Both events occurred with a slight bias to silicone yield. The preponderance of events occurred in the load range of 350 lbs. to 400 lbs.

No failure occurred below the 300 lb. load threshold which translates to 150 lb. load per single raft. When considering the dynamic nature of building construction, momentary, temporary, and incidental overloading of building components cannot be overlooked and should not be underestimated. For this reason HushFrame 300 series Raft connectors shall not be installed in an environment where the design combined dead and live loads exceed 50 lbs. per raft, allowing a safety factor of three.

Under no circumstance shall fewer than four raft connectors, mounted in a quad pattern, be installed in an actual field setting to prevent accidental or incidental non-linear rotational loading.

Alan Case, Manager
BCD, LLC
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