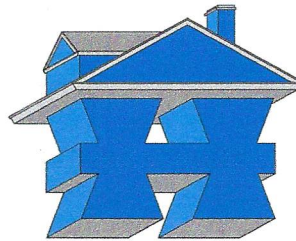


BCD, LLC

Building Component Development

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Licensed Manufacturing Distributor
for

HUSHFRAME®

Raft® Connectors



February 19, 2019

To Whom it may concern:

Re:

Structural Tension Test of HushFrame 300 series Raft connectors
conducted Tuesday, February 19, 2019 at the BCD manufacturing
facility at 55 Woodrock Rd., E. Weymouth, MA.

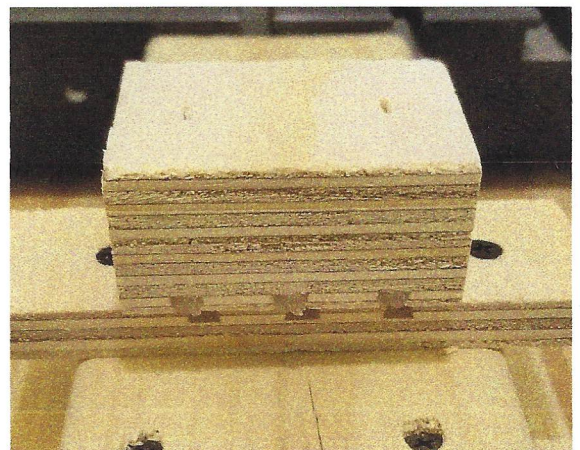
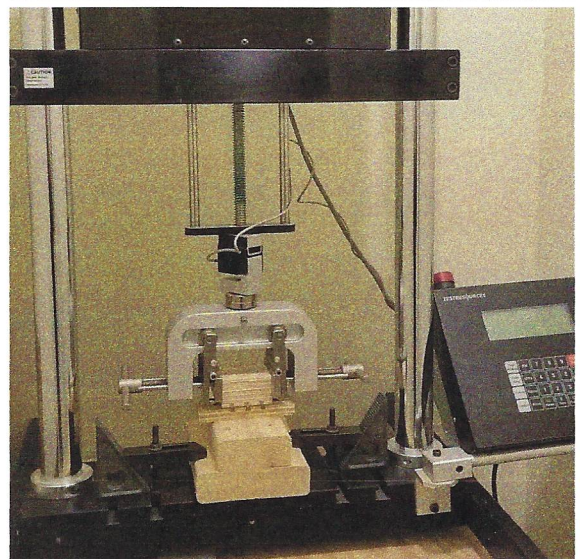
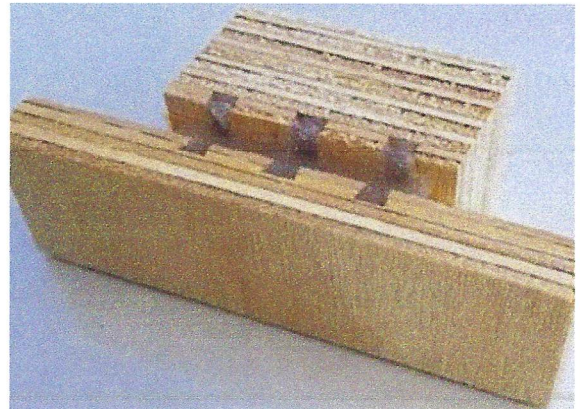
Testing performed by Alan Case, manager, witnessed by Stephen Smith, manufacturing technician, and run on a Test Resources model 140 Dual Column test machine. The machine was calibrated for zero tolerances prior to conducting the tests.

The rafts consist of two opposing plywood mounts sandwiched in place via a silicone rubber core that extends into dovetailed channels 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 on top of a section of common 2x4 framing stock which in turn was fastened to a section of 2x6 framing lumber securely clamped to the test machine base plate. The rafts were secured to the 2x4 with two 1-1/4" bugle-head screws, one on each side. The furring mount block was then clamped to the actuator jaw of the of the machine and testing commenced.

Each raft was subjected to tension loading and measurement recording beginning with 50 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 rafts were then loaded to failure to reveal a yield point and cause.

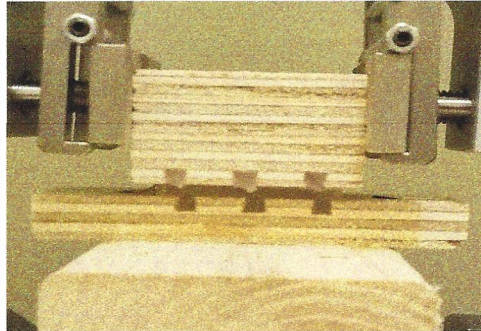


Proudly made in the USA

Screen grabs of typical test series

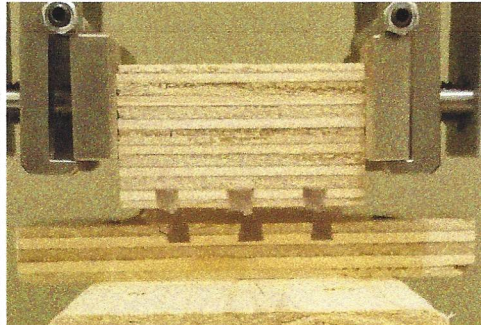
Corresponding photos

50.20Lbf
0.0171in
0.0000/min



At 50 lbs. of pull, the silicone core elongation was $1/64$ " and no yield occurred.

101.00Lbf
0.0276in
0.0000/min



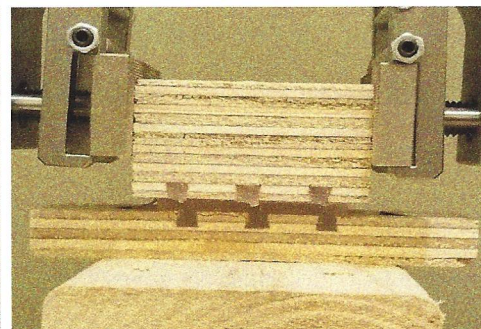
At 100 lbs. of pull, the silicone core elongation was less than $1/32$ " and no yield occurred.

150.30Lbf
0.0424in
0.0000/min



At 150 lbs. of pull, the silicone core elongation was slightly greater than $1/32$ " and no yield occurred.

200.50Lbf
0.0555in
0.0000/min



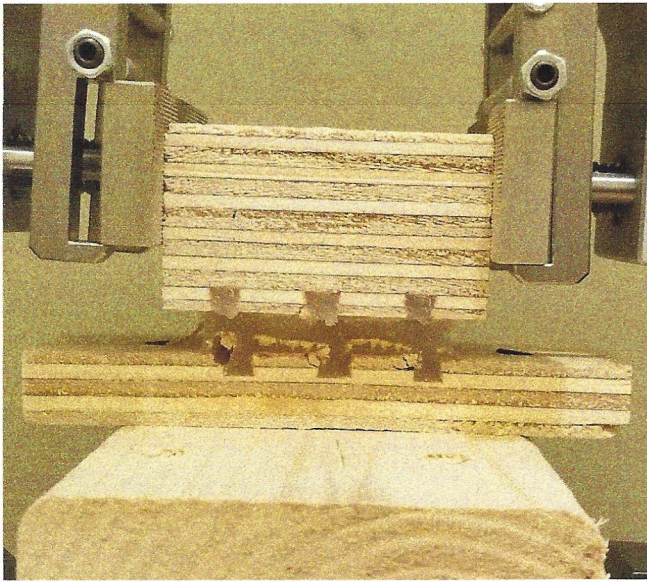
At 200 lbs. of pull, the silicone core elongation was less than $1/16$ " and no yield occurred.

251.00Lbf
0.0654in
0.0000/min



At 250 lbs. of pull, the silicone core elongation was $1/16$ " and slight tearing of the plywood veneer was observed.

Elongation and veneer tearing at 300 lbs. pull



At 300 lbs. of tension loading the Rafts experienced increased elongation of the silicone core, some lifting of the plywood veneer along the edges of the mount and small fissures in the dovetail channels appeared. No yield occurred.

The Rafts exhibited tremendous strength under tension loading. No distortion of the devices beyond 1/16" of elongation occurred through 250 lbs. of applied force. At 300 lbs. of force, elongation increased where sections of the plywood mounts were stressed and clearly exhibited initial stages of separation. Failure of the Rafts occurred at various points of loading beginning shortly beyond 300 lbs. of force.

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 a tension environment where the combined dead and live loads exceed 80 lbs. per Raft, allowing a minimum 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
Building Component Development

February 19, 2019