



March 23, 2011

Mr. Stewart Wentworth
QUICK MOUNT PV
936 Detroit Avenue, Suite D
Concord, CA 94518-2539

Project Number 111114C

Subject: New Construction Composition Mount (QMNC 3-3/4" Finished Height) Load Testing

Dear Mr. Wentworth:

As requested, Applied Materials & Engineering, Inc. (AME) has completed load-testing the New Construction Composition Mount (QMNC) hardware. The purpose of our testing was to evaluate the shear load capacity of the New Construction Composition Mount hardware attached to a commercially available 2"x4" Douglas Fir rafter.

SAMPLE DESCRIPTION

Six (6) mockup samples were delivered to our laboratory on March 9, 2011. Mockup configuration consisted of three 16" long rafters at 7" o.c., screwed to 1/2" Structural 1 plywood. The 3-3/4" (finished height) Quick Mount Standoff (QMSO) hardware is attached through the plywood into the rafter with two 5/16"x3" lag bolts torqued to 15ft-lbs.

TEST PROCEDURES & RESULTS

1. Shear Strength Parallel to Rafter

Three samples were tested for shear strength on March 18, 2011 using a United Universal testing machine. Samples were rigidly attached to the testing machine and a shear load was applied to the 5/16"x1" machine bolt connected to the aluminum standoff. The samples were loaded parallel to rafter at a constant rate of axial deformation of 0.01 in./min. without shock until failure occurred. Based on the above testing, the average ultimate shear load, parallel to rafter, of the Quick Mount Standoff hardware in Douglas Fir was determined to be 1972 lbf.

The specific gravity and moisture content of the rafter was tested in accordance with ASTM D2395, Method A (oven-dry). The average specific gravity and moisture content was determined to be 0.417 and 17.4%, respectively. Detailed results are provided in Table I. Test setup and mode of failure are provided in Appendix A.

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2. Shear Strength Perpendicular to Rafter

Three samples were tested for shear strength on March 18, 2011 using a United Universal testing machine. Samples were rigidly attached to the testing machine and a shear load was applied to the 5/16"x1" machine bolt connected to the aluminum standoff. The samples were loaded perpendicular to rafter at a constant rate of axial deformation of 0.01 in./min. without shock until failure occurred. Based on the above testing, the average ultimate shear load, perpendicular to rafter, of the Quick Mount Standoff hardware in Douglas Fir was determined to be 1466 lbf.

The specific gravity and moisture content of the rafter was tested in accordance with ASTM D2395, Method A (oven-dry). The average specific gravity and moisture content was determined to be 0.494 and 17.2%, respectively. Detailed results are provided in Table II. Test setup and mode of failure are provided in Appendix A.

If you have any questions regarding the above, please do not hesitate to call the undersigned.

Respectfully Submitted,

APPLIED MATERIALS & ENGINEERING, INC.

Reviewed By:


Mohammed Faiyaz
Laboratory Manager


Armen Tajirian, Ph.D., P.E.
Principal

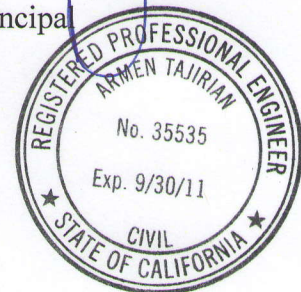


TABLE I
NEW CONSTRUCTION COMPOSITION MOUNT (QMNC)
3-3/4" FINISHED HEIGHT
SHEAR LOAD PARALLEL TO RAFTER TEST RESULTS
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SAMPLE ID	ULTIMATE SHEAR LOAD PARALLEL TO RAFTER (LBF)	RAFTER MOISTURE CONTENT (%)	RAFTER SPECIFIC GRAVITY	FAILURE MODE¹.
PARA-1	1904	18.3	0.419	Lag Bolt Pull-Out
PARA-2	1848	17.5	0.449	Lag Bolt Pull-Out
PARA-3	2165	16.5	0.384	Lag Bolt Pull-Out
AVERAGE	1972	17.4	0.417	..

¹. Upper bolt.

TABLE II
NEW CONSTRUCTION COMPOSITION MOUNT (QMNC)
3-3/4" FINISHED HEIGHT
SHEAR LOAD PERPENDICULAR TO RAFTER TEST RESULTS
PROJECT NUMBER 11114C

SAMPLE ID	ULTIMATE SHEAR LOAD PERPENDICULAR TO RAFTER (LBF)	RAFTER MOISTURE CONTENT (%)	RAFTER SPECIFIC GRAVITY	FAILURE MODE
PERP-1	1627	17.6	0.549	Plywood Buckled/Bent Machine Bolt
PERP-2	1484	18.1	0.533	Plywood Buckled/Bent Machine Bolt
PERP-3	1286	16.0	0.400	Plywood Buckled/Bent Machine Bolt
AVERAGE	1466	17.2	0.494	..

APPENDIX A

NEW CONSTRUCTION COMPOSITION MOUNT (QMNC)
3-3/4" FINISHED HEIGHT
SHEAR TEST SETUP

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Figure 1a. Shear Parallel to Rafter

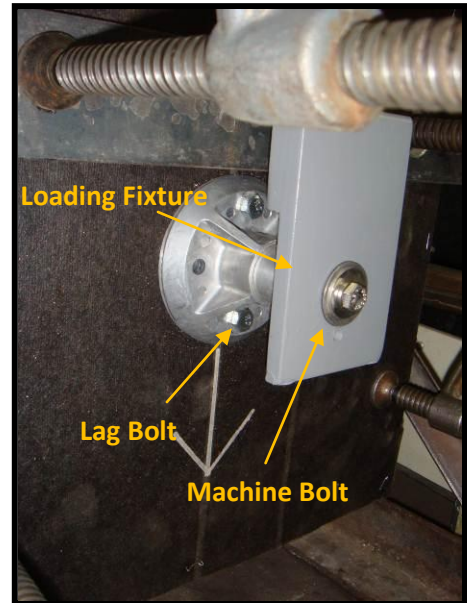


Figure 1b. Shear Test Close-up



Figure 2a. Shear Perpendicular to Rafter



Figure 2b. Shear Test Close-up

NEW CONSTRUCTION COMPOSITION MOUNT (QMNC)
3-3/4" FINISHED HEIGHT
TYPICAL FAILURE MODE

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Figure 3. Lag Bolt Pull-Out
Shear Parallel to Rafter



Figure 4a. Buckled Plywood
Shear Perpendicular to Rafter

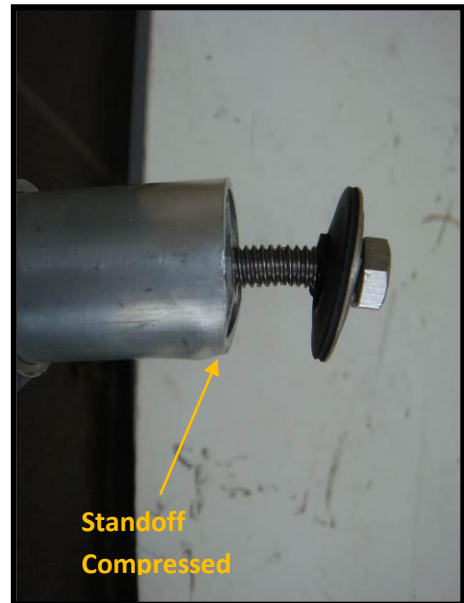


Figure 4b. Bent Bolt
Shear Perpendicular to Rafter