May 22, 2009

Revised Pages 10 & 11 on 12/13/2011 for Editorial Changes Only
Report Re-stamped on 02/14/2014

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

Project Number 108443C
ICC-ES FILE # 08-09-16

Subject: Quick Mount PV Load Testing
ICC-ES AC13 & ASTM D 1761

Dear Mr. Wentworth:

As requested, Applied Materials & Engineering, Inc. (AME) has completed load-testing Quick Mount PV system anchors for shear and tensile strength. The purpose of our testing was to evaluate the tensile and shear load capacity of the Quick Mount PV system in a high density (Douglas Fir) and a low density wood (Cedar).

SAMPLE DESCRIPTION

Twelve (12) 12"x12" samples with 2-1/4" X 3-1/8" Unirac Angle were delivered to our laboratory on April 26, 2009; six each for Douglas Fir and Cedar. A copy of the installation instructions is provided in Appendix A. Typical sample photo is provided in Appendix B.

PROCEDURES & RESULTS

Since an acceptance criterion (AC) has not been developed for this product, the samples were tested under the direction of Mr. Yamil Moya, P.E. with ICC-ES, and in general accordance with applicable procedures outlined in ASTM D 1761 and AC13.

a. Tensile Strength

Three samples each of the two types of wood were tested for tensile strength on April 28, 2009 using a United Universal testing machine. Samples were rigidly attached to the testing machine and a tensile load was applied to the Unirac Angle at a displacement rate 0.1 inches per minute without shock until failure. Detailed results are provided in Table I. Based on these results, the average tensile strength of the hanger bolt in Douglas Fir and Cedar wood species were determined to be 2554 lbf and 1355 lbf, respectively.
b. Shear Strength

Three samples each of the two types of wood were tested for shear strength on May 12, 2009 using a United Universal testing machine. Samples were rigidly attached to the testing machine and a shear load was applied to Unirac Angle at a displacement rate 0.1 inches per minute without shock until failure. Detailed results are provided in Table II. Based on these results, the average shear strength of the hanger bolt in Douglas Fir and Cedar wood species were determined to be 2203 lbf and 1957 lbf, respectively.

Photographs illustrating typical setups are provided in Appendix C.

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

Respectfully Submitted,

APPLIED MATERIALS & ENGINEERING, INC.

Mohammed Faraz
Laboratory Manager

Reviewed By:

[Stamp with name and signature]
TABLE I

QUICK MOUNT PV- 5/16"X6" HANGER (LAG) BOLT WITH 2-1/4" X 3-1/8" UNIRAC ANGLE

TENSILE LOAD TEST RESULTS

PROJECT NUMBER 108443C

<table>
<thead>
<tr>
<th>SAMPLE ID</th>
<th>WOOD SPECIES</th>
<th>ULTIMATE LOAD IN TENSION (LBF)</th>
<th>FAILURE MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1</td>
<td>Douglas Fir</td>
<td>2660</td>
<td>Lag bolt pulled out</td>
</tr>
<tr>
<td>T-2</td>
<td>Douglas Fir</td>
<td>2567</td>
<td>Lag bolt pulled out</td>
</tr>
<tr>
<td>T-3</td>
<td>Douglas Fir</td>
<td>2434</td>
<td>Lag bolt pulled out</td>
</tr>
<tr>
<td>Average</td>
<td>...</td>
<td>2554</td>
<td>...</td>
</tr>
<tr>
<td>T-4</td>
<td>Cedar</td>
<td>1323</td>
<td>Lag bolt pulled out</td>
</tr>
<tr>
<td>T-5</td>
<td>Cedar</td>
<td>1309</td>
<td>Lag bolt pulled out</td>
</tr>
<tr>
<td>T-6</td>
<td>Cedar</td>
<td>1433</td>
<td>Lag bolt pulled out</td>
</tr>
<tr>
<td>Average</td>
<td>...</td>
<td>1355</td>
<td>...</td>
</tr>
</tbody>
</table>
## TABLE II

**QUICK MOUNT PV- 5/16"X6" HANGER (LAG) BOLT WITH 2-1/4" X 3-1/8" UNIRAC ANGLE**

**SHEAR LOAD TEST RESULTS**

**PROJECT NUMBER 108443C**

<table>
<thead>
<tr>
<th>SAMPLE ID</th>
<th>WOOD SPECIES</th>
<th>ULTIMATE LOAD IN SHEAR (LBF)</th>
<th>FAILURE MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Douglas Fir</td>
<td>2351</td>
<td>Bent lag bolt</td>
</tr>
<tr>
<td>S-2</td>
<td>Douglas Fir</td>
<td>2012</td>
<td>Bent lag bolt</td>
</tr>
<tr>
<td>S-3</td>
<td>Douglas Fir</td>
<td>2245</td>
<td>Bent lag bolt</td>
</tr>
<tr>
<td>Average</td>
<td>...</td>
<td>2203</td>
<td>...</td>
</tr>
<tr>
<td>S-4</td>
<td>Cedar</td>
<td>2060</td>
<td>Bent lag bolt</td>
</tr>
<tr>
<td>S-5</td>
<td>Cedar</td>
<td>1907</td>
<td>Bent lag bolt</td>
</tr>
<tr>
<td>S-6</td>
<td>Cedar</td>
<td>1903</td>
<td>Bent lag bolt</td>
</tr>
<tr>
<td>Average</td>
<td>...</td>
<td>1957</td>
<td>...</td>
</tr>
</tbody>
</table>
Quick Mount PV™ is an all-in-one waterproof flashing and mount to anchor photovoltaic
racking systems, solar thermal panels, air conditioning units, satellite dishes, or anything
you may need to secure to a new or existing roof. It is made in the USA of all aluminum
and includes stainless steel hardware. It works with all standard racks, installs
seamlessly and saves labor by not needing to cut away any roofing, will out live
galvanized 2 to 1, and is a better low-profile mount.

**Flat Washer (B) 1” x 5/16”**
**Rubber Gasket 60 Durometer EPDM**
**Sealing Washer (A) 3/4” x 5/16”**
**Hanger Bolt 5/16” x 6”**
  1-1/2” Machine, 1-1/2” Spacer, 3” Lag
**Mount & Flashing** Aluminum
  Mount 2-1/4”l x 1-1/4”w x 1-1/4”h
  Flashing .05” thick.
  For standard composition roofs: flashing is 12”
  x 12”, mount is attached 3” off center. For
  shake roofs: flashing is 18” x 18”, mount is
  attached 6” off center.

**Note:** Mount is cast aluminum
QUICK MOUNT PV TENSION TEST SETUP

AME PROJECT 108843C

Test Wood

Unirac Angle

Cast Aluminum Block

Tensile Load, P
QUICK MOUNT PV SHEAR TEST SETUP

AME PROJECT 108843C

Shear Load, \( P \)

Cast Aluminum Block

Unirac Angle

Test Wood

Distance in inches from the flashing where the centerline of the point load is located is 2.75”
To whom it may concern,

Quick Mount PV offers extensive testing for all our products conducted by a third-party licensed professional engineer. All our third-party engineering reports are stamped by a licensed professional engineer at the time the reports were prepared and do not expire. Our engineering reports continue to be valid as long as the professional engineer's license (date within the stamp) was valid when the reports were prepared (the report date). Even if the license has expired between the time the engineering reports were prepared and the time when a local agency reviews them, the reports do NOT need to be re-stamped with a current stamp.

This information is written into California State law under the Professional Engineers Act within the Business and Professions Code (B&P Code §§ 6700-6799). The California Board for Professional Engineers and Land Surveyors (BPELS) provides further clarification of the code in their Guide to Engineering & Land Surveying for City and County Officials, page 12 section 27, which is cited below.

27. If the license has expired between the time the engineering documents were prepared and the time when the local agency's review is performed, do the documents need to be re-sealed by a licensee with a current license? (B&P Code §§ 6733, 6735, 6735.3, 6735.4)

As long as the license was current at the time the engineering documents were prepared, the documents do not need to be re-sealed prior to review by the local agency. However, any changes (updates or modifications) to the documents that are made following the review by the local agency would have to be prepared by a licensed engineer with a current license and those changes would have to be signed and sealed.

It should also be noted that as of January 1, 2010 professional engineers are not required to include their license expiration date when they sign and stamp engineering documents only the date that they signed the document (B&P Code §§ 6735, 6735.3, 6735.4, 6764, 8750, 8761 & 8764.5). Links to all of the codes and guides referenced in this letter may be found online at quickmountpv.com under FAQ. Please submit any further questions to tech@quickmountpv.com.

Sincerely,

Jennifer D. Alfsen, BSME
R&D Mechanical Engineer
Quick Mount PV