



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.

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**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.**

**Reviewed By:**

  
Mohammed Faiyaz  
Laboratory Manager

  
Armen Tajirian, Ph.D., P.E.  
Principal  
Exp. 9/30/15  
CIVIL  
STATE OF CALIFORNIA  
2/14/15



**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**

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

**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**

<b>SAMPLE ID</b>	<b>WOOD SPECIES</b>	<b>ULTIMATE LOAD IN SHEAR (LBF)</b>	<b>FAILURE MODE</b>
S- 1	Douglas Fir	2351	Bent lag bolt
S-2	Douglas Fir	2012	Bent lag bolt
S-3	Douglas Fir	2245	Bent lag bolt
<b>Average</b>	...	<b>2203</b>	...
S-4	Cedar	2060	Bent lag bolt
S-5	Cedar	1907	Bent lag bolt
S-6	Cedar	1903	Bent lag bolt
<b>Average</b>	...	<b>1957</b>	...

**APPENDIX A**

# INSTALLATION INSTRUCTIONS

# Quick Mount PV™

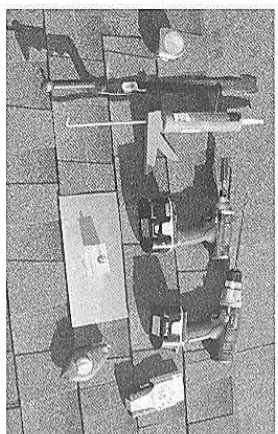
(510) 652-6686  
www.quickmountpv.com

### TOOLS NEEDED

Measuring tape, roofer's flat bar, chalk line, stud finder, caulking gun with roofing sealant, drill with 1/4" long bit, drill with 1/2" deep socket.

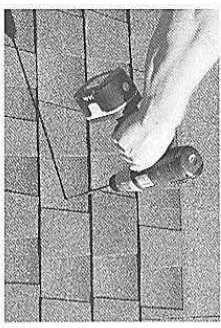
### 1. LOCATE RAFTER

Using horizontal and vertical chalk lines to align hole for placement of each Quick Mount



### 2. DRILL PILOT HOLE

Using drill with 1/4" long bit, drill pilot hole through roof and rafter, taking care to drill square to the roof.

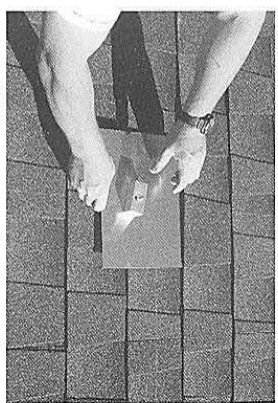
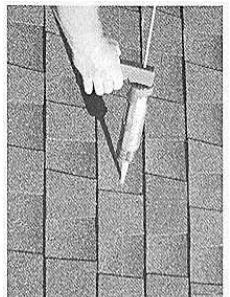


### 3. LIFT TILE

Lift composition roof tile with roofers flat bar, just above placement of Quick Mount.

### 4. SEAL HOLE

Using caulking gun with roofing sealant, squeeze a dab of roofing sealant into hole.

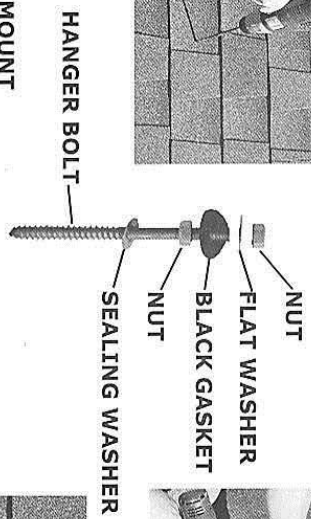


### 5. SLIDE QUICK MOUNT INTO PLACE

Lift comp tile and slide Quick Mount into place.

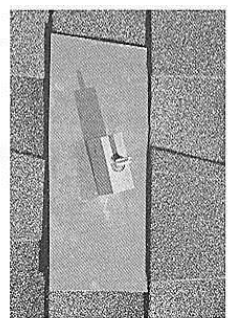
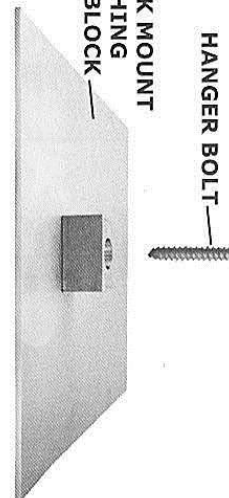
### 6. SET HANGER BOLT, SEALING WASHER & NUT

Using drill with 1/2" deep socket, set sealing washer with rubber side down, then nut, and tighten into place.



### 7. ADD RUBBER GASKET

Push black gasket into place flush with top of Quick Mount block.



### 8. SECURE RACK INTO PLACE, WITH FLAT WASHER & NUT

Using drill with 1/2" deep socket, set up track over bolt, with flat washer, then nut, and tighten into place.



PATENT PENDING

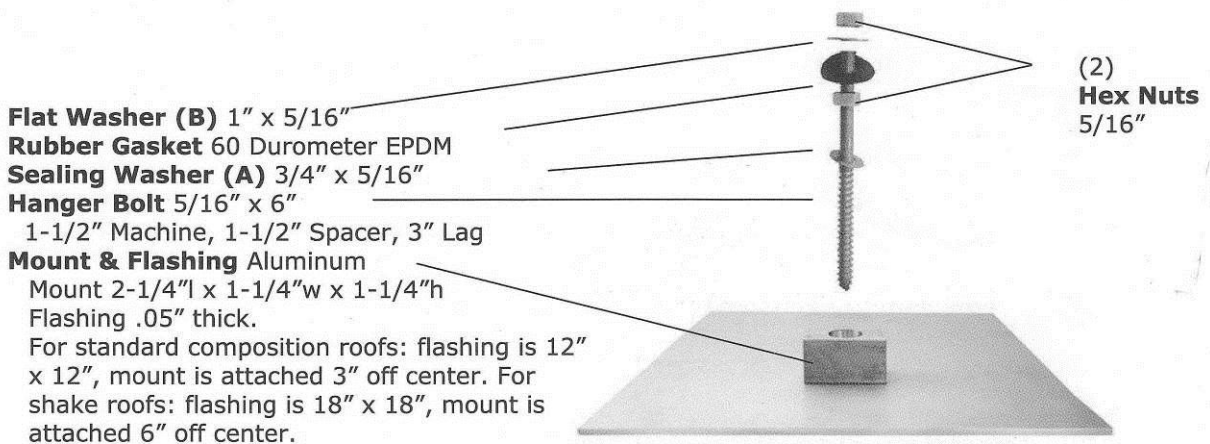
03-2008 [InstallInstc.]

**APPENDIX B**

# Quick Mount PV™

## SPECIFICATION SHEET

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.



Patent Pending

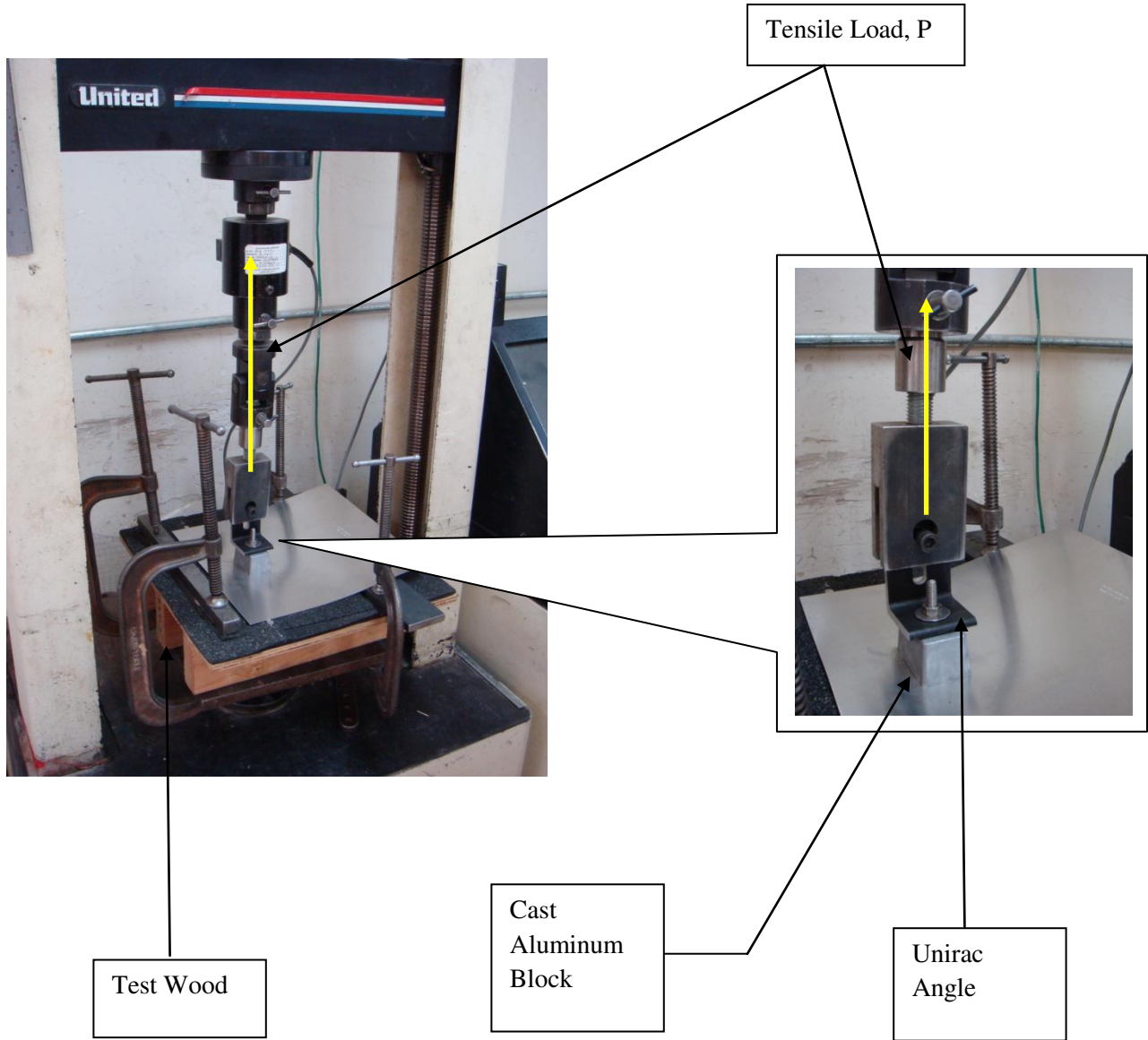
**Note:** Mount is cast aluminum



**APPENDIX C**

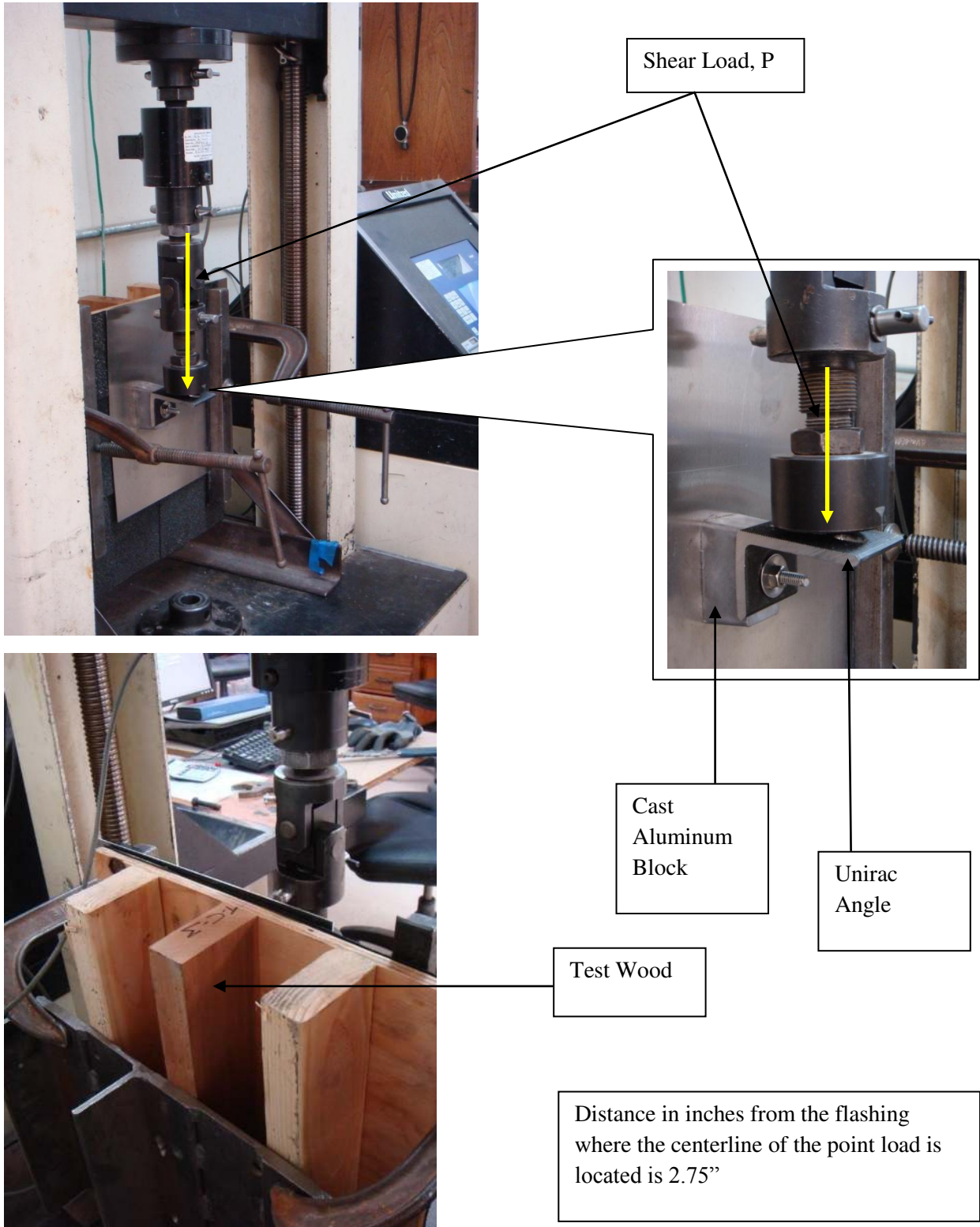
**QUICK MOUNT PV TENSION TEST SETUP**

**AME PROJECT 108843C**



**QUICK MOUNT PV SHEAR TEST SETUP**

**AME PROJECT 108843C**



### *Stamped Engineering Test Reports Do Not Expire*

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](http://quickmountpv.com) under FAQ. Please submit any further questions to [tech@quickmountpv.com](mailto:tech@quickmountpv.com).

Sincerely,



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