TEST REPORT

Report No.: G3205.03-301-32

Rendered to:

MOUNTING-SYSTEMS
West Sacramento, California

PRODUCT TYPE: Fitting Brackets for PV Module
SERIES/MODEL: Element Rail-Free On-Roof System

<table>
<thead>
<tr>
<th>Title</th>
<th>Summary of Results</th>
</tr>
</thead>
</table>
| Water Penetration Resistance Test Pressure Composition Shingle Roof | 15.0 psf
|                                                 | 2 hour duration    |

1.0 Report Issued To: Mounting Systems, Inc.
820 Riverside Parkway
West Sacramento, California 95605

2.0 Test Laboratory: Architectural Testing, Inc.
2524 East Jensen Avenue
Fresno, California 93706
(559) 233-8705

3.0 Project Summary:

3.1 Product Type: Fitting Brackets for PV Module

3.2 Series/Model: Element Rail-Free On-Roof System

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). Test specimen description and results are reported herein.

3.4 Test Date: 09/25/2016

3.5 Test Location: Architectural Testing, Inc. test facility in Fresno, California.

3.6 Test Sample Source: The test specimen was provided by the client.

4.0 Test Method:


5.0 Test Specimen Description:

5.1 Product Sizes:

<table>
<thead>
<tr>
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<th>Width</th>
<th>Length</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>inches</td>
<td>inches</td>
</tr>
<tr>
<td>Flashing</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Flashing Plate</td>
<td>1-3/8</td>
<td>3-1/2</td>
</tr>
</tbody>
</table>

5.2 Roof Construction:

One 1000mm x 1000mm roof was assembled by the test lab. The roof mock up was composed of composition shingles over 1/2" lexan with 2x4 Douglas fir rafters spaced lengthwise 24" on center. The roof was tested at a 12:1 slope from horizontal.

6.0 Installation:

Three Element Flashing brackets were held in place with one 5/16" x 4" lag screw and EPDM bonded washer over an aluminum flashing and flashing plate. The predrilled hole for the lag screw was filled with roofing sealant prior to inserting lag screw. A ‘U’ Shaped sealant bead was applied to the underside of the flashing oriented in the uphill direction.
7.0 Test Results:

The average temperature during testing was 78°F. The results are tabulated as follows:

<table>
<thead>
<tr>
<th>Title of Test</th>
<th>Results</th>
<th>Allowed</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Penetration Composition Shingle Roof</td>
<td>Pass</td>
<td>No leakage</td>
<td>1,2,3</td>
</tr>
<tr>
<td>15.0 psf per ASTM E 331 &amp; E1646 Two Hours</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** The roof was monitored for 2 hours and no water leakage was observed.

**Note 2:** See testing Photo No. 1.

**Note 3:** Vacuum was applied at the underside of the simulated roof deck.

The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, Inc.

[Signatures]

Dennis Janzen
Technician

Tyler Westerling, P.E.
Senior Project Engineer

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Photographs (5)
Appendix-B: Installation Instructions (20)
## Revision Log

<table>
<thead>
<tr>
<th>Rev. #</th>
<th>Date</th>
<th>Page(s)</th>
<th>Revision(s)</th>
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<td>0</td>
<td>10/13/16</td>
<td>N/A</td>
<td>Original report issue.</td>
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</table>
Appendix A
Photographs
Photo No. 2
Roof mock up showing 12:1 Slope
Photo #3
Water Spray Testing
Photo No. 4
Showing, 'U' shaped sealant bead
Photo #5
Water Spray Testing