



## **ANSI/SPRI ES-1 PERFORMANCE TEST REPORT**

Rendered to:

**ATAS INTERNATIONAL, INC.**

For:

***Rapid-Lok Fascia, Drip Edge, Gravel Stop Fascia, Continuous Cleat Coping,  
and Rapid-Lok Coping Edge Metal Systems***

**Report No: F1420.02-119-16**

**Report Date: 12/17/15**

**Test Record Retention Date: 11/24/19**



## **ANSI/SPRI ES-1 PERFORMANCE TEST REPORT**

Rendered to:

ATAS INTERNATIONAL, INC.  
6612 Snowdrift Road  
Allentown, Pennsylvania 18106

Report No.: F1420.02-119-16

Test Dates: 10/28/15

Through: 11/24/15

Report Date: 12/17/15

Test Record Retention Date: 11/24/19

### **1.0 General Information**

#### **1.1 Products**

*Rapid-Lok Fascia, Drip Edge, Gravel Stop, Continuous Cleat Coping, and Rapid-Lok Coping Edge Metal Systems*

#### **1.2 Project Summary**

Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by ATAS International, Inc. to perform ANSI/SPRI Test RE-3 on formed steel and aluminum edge flashing and coping materials in accordance with the following:

*ANSI/SPRI/FM 4435/ ES-1 2011, Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems*

#### **1.3 Qualifications**

Intertek-ATI in York, Pennsylvania has demonstrated compliance with ISO/IEC International Standard 17025 and is consequently accredited as a Testing Laboratory (TL-144) by International Accreditation Service, Inc. (IAS).

#### **1.4 Witnessing**

A representative from ATAS International was present to demonstrate proper installation of the edge flashing and coping, and to witness the testing conducted and reported herein.

#### **1.5 Conditions of Testing**

All testing reported herein was conducted in a laboratory set to maintain temperature in the range of  $68 \pm 4^{\circ}\text{F}$  and humidity in the range of  $50 \pm 5\% \text{ RH}$ . All test specimen materials were stored in the laboratory environment indicated for no less than 40 hours prior to testing.

## 2.0 ANSI/SPRI Test RE-2, Pull-Off Test for Edge Flashings

### 2.1 Specimen Description

12 ft long sections of:

- 11-1/2 in formed aluminum (0.040 in) *Rapid-Lok Fascia* edge flashing with 20 GA continuous steel cleat
- 11-1/2 in formed steel (24 GA) *Rapid-Lok Fascia* edge flashing with 20 GA continuous steel cleat
- 7-3/4 in formed aluminum (0.040 in) *Drip Edge* edge flashing with 22 GA continuous steel cleat
- 7-3/4 in formed steel (24 GA) *Drip Edge* edge flashing with 22 GA continuous steel cleat

All fascia profiles were attached to parapet mock-ups constructed SPF dimension lumber for testing.

Prior to assembly, the front face of the *Rapid Lok* and *Drip Edge* fascia was drilled and fitted with twelve 5/16 in eyebolts, fender washers (one each side) and hex nuts (one each side), 12 in on center, on the longitudinal centerline.

The front face of the cleat for the *Rapid-Lok Fascia* was screwed to the face of a 2x10 SPF member with a single row of #10-13 x 1" GP fastener, 12 in on center.

The *Rapid-Lok Fascia* was then hooked onto the top face and bottom of the cleat.

The top of the cleat for the *Drip Edge* fascia were nailed to the top of a 2x10 SPF member with a single row of 1-1/2 in ring shank nails, 12 in on center. The front face of the cleat for the *Drip Edge* fascia was nailed to the edge of the 2x10 SPF member with a single row of 1-1/2 in ring shank nails, 12 in on center.

The *Drip Edge* fascia was then hooked onto the bottom of the cleat and then attached to the top of the 2x10 SPF member using a single row of 1-1/2 in ring shank nails, 12 in on center.

See drawings in Appendix A and photographs in Appendix B for additional details.

### 2.2 Test Procedure

Load was applied to the twelve eye bolts using equal-length chains, a spreader beam, steel cable and an electric winch. Applied load was measured with an in-line 2000 pound load cell. Center-point deflection of the flashing face was measured with an electronic linear displacement transducer. Load was applied incrementally and held ("Sustained") for a minimum of 60 seconds with intermediate load relaxation periods for specimen deflection to stabilize.

Mode of failure for all specimens was flashing pull-off from the lower lip of the cleat, while load was increasing.

See photographs in Appendix B for test set-up.

## 2.3 Test Results

### ANSI/SPRI Test RE-2 Pull-Off Test for Edge Flashing - Test Date: 10/28/15

*Rapid-Lok Fascia* edge flashing system – 11-1/2 in high by 12 ft long – Continuous Cleat

| Specimen No. | Fascia Material   | Peak Load at Failure (lb) | Max. Sustained Load prior to Failure (lb) | Equivalent Sustained Pressure (psf) |
|--------------|-------------------|---------------------------|-------------------------------------------|-------------------------------------|
| 1            | 0.040 in Aluminum | 2236                      | 2134                                      | 180                                 |
| 2            |                   | 2056                      | 2056                                      | 160                                 |
| 3            |                   | 2052                      | 2052                                      | 160                                 |
| Average:     |                   | 2115                      | 2081                                      | 167                                 |

### ANSI/SPRI Test RE-2 Pull-Off Test for Edge Flashing - Test Date: 10/28/15

*Rapid-Lok Fascia* edge flashing system – 11-1/2 in high by 12 ft long – Continuous Cleat

| Specimen No. | Fascia Material | Peak Load at Failure (lb) | Max. Sustained Load prior to Failure (lb) | Equivalent Sustained Pressure (psf) |
|--------------|-----------------|---------------------------|-------------------------------------------|-------------------------------------|
| 1            | 24 GA Steel     | 1778                      | 1778                                      | 150                                 |
| 2            |                 | 1764                      | 1572                                      | 125                                 |
| 3            |                 | 1614                      | 1614                                      | 125                                 |
| Average:     |                 | 1719                      | 1655                                      | 133                                 |

### ANSI/SPRI Test RE-2 Pull-Off Test for Edge Flashing - Test Date: 10/29/15

*Drip Edge* flashing system – 7-3/4 in high by 12 ft long – Continuous Cleat

| Specimen No. | Fascia Material   | Peak Load at Failure (lb) | Max. Sustained Load prior to Failure (lb) | Equivalent Sustained Pressure (psf) |
|--------------|-------------------|---------------------------|-------------------------------------------|-------------------------------------|
| 1            | 0.040 in Aluminum | 2014                      | 2014                                      | 240                                 |
| 2            |                   | 1962                      | 1962                                      | 240                                 |
| 3            |                   | 2018                      | 2018                                      | 250                                 |
| Average:     |                   | 1998                      | 1998                                      | 243                                 |

## 2.3 Test Results (Continued)

### ANSI/SPRI Test RE-2 Pull-Off Test for Edge Flashing - Test Date: 10/29/15

#### *Drip Edge* flashing system – 7-3/4 in high by 12 ft long – Continuous Cleat

| Specimen No. | Material    | Peak Load at Failure (lb) | Max. Sustained Load prior to Failure (lb) | Equivalent Sustained Pressure (psf) |
|--------------|-------------|---------------------------|-------------------------------------------|-------------------------------------|
| 1            | 24 GA Steel | 1832                      | 1832                                      | 230                                 |
| 2            |             | 2042                      | 2042                                      | 230                                 |
| 3            |             | 1972                      | 1972                                      | 230                                 |
| Average:     |             | 1949                      | 1949                                      | 230                                 |

### ANSI/SPRI Test RE-2 Pull-Off Test for Edge Flashing - Test Date: 10/30/15

#### *Gravel Stop* flashing system – 8-1/2 in high by 12 ft long – Continuous Cleat

| Specimen No. | Fascia Material   | Peak Load at Failure (lb) | Max. Sustained Load prior to Failure (lb) | Equivalent Sustained Pressure (psf) |
|--------------|-------------------|---------------------------|-------------------------------------------|-------------------------------------|
| 1            | 0.040 in Aluminum | 1732                      | 1648                                      | 190                                 |
| 2            |                   | 2164                      | 2082                                      | 240                                 |
| 3            |                   | 1592                      | 1592                                      | 180                                 |
| Average:     |                   | 1829                      | 1774                                      | 203                                 |

### ANSI/SPRI Test RE-2 Pull-Off Test for Edge Flashing - Test Date: 10/30/15

#### *Gravel Stop* flashing system – 8-1/2 in high by 12 ft long – Continuous Cleat

| Specimen No. | Material    | Peak Load at Failure (lb) | Max. Sustained Load prior to Failure (lb) | Equivalent Sustained Pressure (psf) |
|--------------|-------------|---------------------------|-------------------------------------------|-------------------------------------|
| 1            | 24 GA Steel | 1850                      | 1850                                      | 200                                 |
| 2            |             | 1756                      | 1756                                      | 200                                 |
| 3            |             | 1916                      | 1916                                      | 200                                 |
| Average:     |             | 1841                      | 1841                                      | 200                                 |

### 3.0 ANSI/SPRI Test RE-3, Pull-Off Test for Copings

#### 3.1 Specimen Description

12 ft long sections of:

- 24 in wide top face by 5-1/2 in high front face by 4-1/2 in high back face formed aluminum (0.040 in) *Continuous Cleat Coping* with 22 GA continuous steel cleat
- 24 in wide top face by 5-1/2 in high front face by 4-1/2 in high back face formed steel (24 GA) *Continuous Cleat Coping* with 22 GA continuous steel cleat
- 32 in wide top face by 7-1/2 in high front face by 5-1/2 in high back face formed aluminum (0.040 in) *Rapid-Lok Coping* with 20 GA steel cleats (12 in wide) spaced 3 ft on center
- 32 in wide top face by 7-1/2 in high front face by 5-1/2 in high back face formed steel (24 GA) *Rapid-Lok Coping* with 20 GA steel cleats (12 in wide) spaced 3 ft on center

All coping profiles were attached to parapet mock-ups constructed SPF dimension lumber for testing.

Prior to assembly, the top and front faces of the *Continuous Cleat Coping* were drilled and each fitted with twelve 5/16 in eyebolts, fender washers (one each side) and hex nuts (one each side), 12 in on center, on the longitudinal centerlines.

The top of the cleat for the 24 in wide *Continuous Cleat Coping* was nailed to the face of a 2x10 SPF member with a single row of 1-1/2 in ring shank nails, 32 in on center. The front face of the cleat was nailed to the edge of the 2x10 SPF member with a single row of 1-1/2 in ring shank nails, 12 in on center.

The 24 in wide *Continuous Cleat Coping* was then hooked onto the front bend of the cleat, wrapped over the top of the mock-up, and its back face was fastened to the edge of the 2x10 SPF member with a single row of #9-15 x 1-1/2" HHSS fasteners, 17 in on center.

The top face of the cleat for the 32 in wide *Rapid-Lok Coping* was screwed to the face of a 2x10 SPF member using four #10-13 x 1" GP fasteners. The front face of the cleat was nailed to the edge of the 2x10 SPF member with two 1-1/2 in ring shank nails.

The 32 in wide *Rapid-Lok Coping* was then hooked onto the front bend of the cleat, wrapped over the top of the mock-up, and its back face was then snapped on the back bend of the cleat.

See drawings in Appendix A and photographs in Appendix B for additional details.

### 3.2 Test Procedure

Load was applied to the twelve eye bolts of the coping top surface using equal-length chains, a spreader beam, steel cable and an electric winch. Applied load was measured with an in-line 2000 pound load cell. Center-point deflection of the coping face was measured with an electronic linear displacement transducer.

Load was applied to the twelve eye bolts of the coping face surface using equal-length chains, a spreader beam, steel cable and electric winch. Applied load was measured with an in-line 2000 pound load cell.

The two loads were applied simultaneously, proportionally and incrementally and held ("Sustained") for a minimum of 60 seconds with intermediate load relaxation periods for specimen deflection to stabilize.

### 3.3 Test Results

**ANSI/SPRI Test RE-3 - Pull-Off Test for Coping - Test Dates: 11/16/15 through 11/17/15**  
**24 in Wide with 5-1/2 in Front Face and 4-1/2 Back Face**  
**Continuous Cleat Coping with Continuous Cleat**

| Thickness                                        | Coping Material <sup>1</sup> |      |      |      |      |      |      |      |                      |      |
|--------------------------------------------------|------------------------------|------|------|------|------|------|------|------|----------------------|------|
|                                                  | Aluminum                     |      |      |      |      |      |      |      |                      |      |
|                                                  | 0.040 in                     |      |      |      |      |      |      |      | Average <sup>3</sup> |      |
| Surface                                          | Top                          | Face | Top  | Face | Top  | Face | Top  | Face | Top                  | Face |
| Surface Width (in)                               | 24.0                         | 4.5  | 24.0 | 5.5  | 24.0 | 5.5  | 24.0 | 5.5  | 24.0                 | 5.5  |
| Max. Sustained Load (lb)                         | 4310                         | 491  | 4390 | 632  | 4256 | 619  | 4266 | 533  | 4304                 | 595  |
| Equivalent Sustained Pressure <sup>2</sup> (psf) | 170                          | 98   | 170  | 98   | 170  | 98   | 170  | 98   | 170                  | 98   |

<sup>1</sup> Testing conducted on 4-1/2 in face to prove that testing was conducted on the worst case (5-1/2 in) face creating the most conservative loads. All coping profiles reached the load capacity of the test equipment therefore an ultimate load due to failure was not established.

<sup>2</sup> In order to comply with ANSI/SPRI/FM 4435/ES-1 2011 the top and face pressures are in the ratio of 1.68 to 0.97 for roof height 60 ft or less.

<sup>3</sup> Reported average is calculated from results of testing conducted on the 5-1/2 in face (worst case) and does not include the results from testing conducted on the 4-1/2 in face.

### 3.3 Test Results (Continued)

**ANSI/SPRI Test RE-3 - Pull-Off Test for Coping - Test Dates: 11/17/15 through 11/18/15**  
**24 in Wide with 5-1/2 in Front Face and 4-1/2 Back Face**  
**Continuous Cleat Coping with Continuous Cleat**

| Thickness                                        | Coping Material <sup>1</sup> |      |      |      |      |      |      |      |                      |      |
|--------------------------------------------------|------------------------------|------|------|------|------|------|------|------|----------------------|------|
|                                                  | Steel                        |      |      |      |      |      |      |      |                      |      |
|                                                  | 24 GA                        |      |      |      |      |      |      |      | Average <sup>3</sup> |      |
| Surface                                          | Top                          | Face | Top  | Face | Top  | Face | Top  | Face | Top                  | Face |
| Surface Width (in)                               | 24.0                         | 5.5  | 24.0 | 4.5  | 24.0 | 5.5  | 24.0 | 5.5  | 24.0                 | 5.5  |
| Max. Sustained Load (lb)                         | 3286                         | 425  | 4648 | 513  | 4358 | 539  | 4376 | 531  | 4007                 | 498  |
| Equivalent Sustained Pressure <sup>2</sup> (psf) | 130                          | 75   | 170  | 98   | 170  | 98   | 400  | 231  | 157                  | 90   |

<sup>1</sup> Testing conducted on 4-1/2 in face to prove that testing was conducted on the worst case (5-1/2 in) face creating the most conservative loads. All coping profiles (with the exception of the first specimen – mode of failure was deformation of the cleat) reached the load capacity of the test equipment therefore an ultimate load due to failure was not established.

<sup>2</sup> In order to comply with ANSI/SPRI/FM 4435/ES-1 2011 the top and face pressures are in the ratio of 1.68 to 0.97 for roof height 60 ft or less.

<sup>3</sup> Reported average is calculated from results of testing conducted on the 5-1/2 in face (worst case) and does not include the results from testing conducted on the 4-1/2 in face.

### 3.3 Test Results (Continued)

**ANSI/SPRI Test RE-3 - Pull-Off Test for Coping - Test Date: 11/20/15 through 11/23/15**  
**32 in Wide with 7-1/2 in Front Face and 5-1/2 Back Face**  
**Rapid-Lok Coping with 20 GA Cleat Spaced at 3 ft O.C.**

| Thickness                                        | Coping Material <sup>1</sup> |      |     |      |     |      |     |      |                      |      |
|--------------------------------------------------|------------------------------|------|-----|------|-----|------|-----|------|----------------------|------|
|                                                  | Aluminum                     |      |     |      |     |      |     |      |                      |      |
|                                                  | 0.040 in                     |      |     |      |     |      |     |      | Average <sup>3</sup> |      |
| Surface                                          | Top                          | Face | Top | Face | Top | Face | Top | Face | Top                  | Face |
| Surface Width (in)                               | 32                           | 5.5  | 32  | 7.5  | 32  | 7.5  | 32  | 7.5  | 32                   | 7.5  |
| Peak Load at Failure (lb)                        | 887                          | 183  | 730 | 181  | 806 | 202  | 746 | 180  | 761                  | 188  |
| Max. Sustained Load Prior to Failure (lb)        | 887                          | 183  | 730 | 181  | 806 | 202  | 746 | 180  | 761                  | 188  |
| Equivalent Sustained Pressure <sup>2</sup> (psf) | 60                           | 35   | 50  | 29   | 50  | 29   | 50  | 29   | 50                   | 29   |

<sup>1</sup> Testing conducted on 5-1/2 in face to prove that testing was conducted on the worst case (7-1/2 in) face creating the most conservative loads.

<sup>2</sup> In order to comply with ANSI/SPRI/FM 4435/ES-1 2011 the top and face pressures are in the ratio of 1.68 to 0.97 for roof height 60 ft or less.

<sup>3</sup> Reported average is calculated from results of testing conducted on the 7-1/2 in face (worst case) and does not include the results from testing conducted on the 5-1/2 in face.

### 3.3 Test Results (Continued)

**ANSI/SPRI Test RE-3 - Pull-Off Test for Coping - Test Date: 11/23/15 through 11/24/15**  
**32 in Wide with 7-1/2 in Front Face and 5-1/2 Back Face**  
**Rapid-Lok Coping with 20 GA Cleat Spaced at 3 ft O.C.**

| Thickness                                        | Coping Material <sup>1</sup> |      |     |      |     |      |     |      |                      |      |
|--------------------------------------------------|------------------------------|------|-----|------|-----|------|-----|------|----------------------|------|
|                                                  | Steel                        |      |     |      |     |      |     |      |                      |      |
|                                                  | 24 GA                        |      |     |      |     |      |     |      | Average <sup>3</sup> |      |
| Surface                                          | Top                          | Face | Top | Face | Top | Face | Top | Face | Top                  | Face |
| Surface Width (in)                               | 32                           | 7.5  | 32  | 5.5  | 32  | 7.5  | 32  | 7.5  | 32                   | 7.5  |
| Peak Load at Failure (lb)                        | 743                          | 193  | 744 | 170  | 645 | 156  | 655 | 192  | 681                  | 180  |
| Max. Sustained Load Prior to Failure (lb)        | 743                          | 193  | 744 | 170  | 645 | 146  | 655 | 192  | 681                  | 177  |
| Equivalent Sustained Pressure <sup>2</sup> (psf) | 50                           | 29   | 50  | 29   | 40  | 23   | 40  | 23   | 43                   | 25   |

<sup>1</sup> Testing conducted on 4-1/2 in face to prove that testing was conducted on the worst case (7-1/2 in) face creating the most conservative loads.

<sup>2</sup> In order to comply with ANSI/SPRI/FM 4435/ES-1 2011 the top and face pressures are in the ratio of 1.68 to 0.97 for roof height 60 ft or less.

<sup>3</sup> Reported average is calculated from results of testing conducted on the 7-1/2 in face (worst case) and does not include the results from testing conducted on the 5-1/2 in face.

#### 4.0 Closing Statement

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period.

Results obtained are tested values and were secured using the designated test methods. 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 specimens tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI:



Digitally Signed by: Adam J. Schrum

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Adam J. Schrum  
Technician I  
Structural Systems Testing

AJS:tah/jas



Digitally Signed by: Travis Hoover

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Travis A. Hoover  
Program Manager  
Structural Systems Testing

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

Appendix A - Drawings (7)

Appendix B - Photographs (2)

### Revision Log

| <u>Rev. #</u> | <u>Date</u> | <u>Page(s)</u> | <u>Revision(s)</u>    |
|---------------|-------------|----------------|-----------------------|
| 0             | 12/17/15    | N/A            | Original report issue |

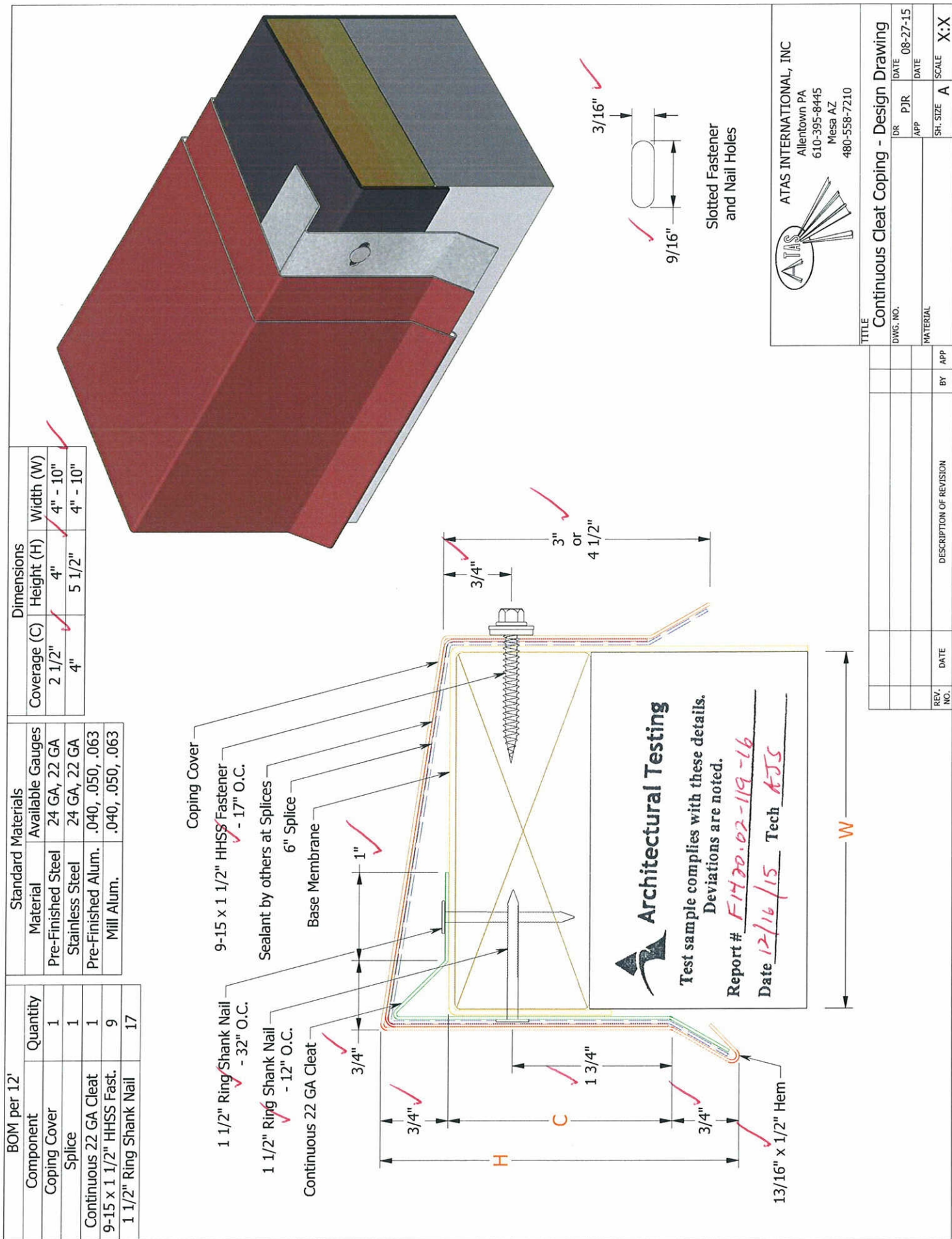
## **APPENDIX A**

### **Drawings**

















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## **APPENDIX B**

### **Photographs**



**Photo No. 1**  
**Typical Test Setup - Fascia System**



**Photo No. 2**  
**Typical Failure Mode - Fascia System**



**Photo No. 3**  
**Typical Test Setup - Coping System**



**Photo No. 4**  
**Typical Failure Mode - Coping System (32 in Wide *Rapid-Lok* Coping)**