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ATLNC # 0521.01-12 Report Date: 6/21/12

Test Date: 05/21/12

ATLNC Certification # 08-0227.14
FL Organizational # TST 1555

Test Requested By: Metal Roofing Systems
7687 Mikron Drive
Stanley, NC 28164
Phone 704-820-3110

Test Standards: ASTM E 1592-05

Test Conditions: 70-75 degrees F

Description of product tested:
Specimen A, 24 gauge (.026") Galvalume Metal Roof Panels over 3-1/2" x 8" x 16 ga. (061") Z purlins as shown in MRS System 2000 dwg 1 - 4. The edge and the ends of the panels were attached to the purlins with self drilling screws.

Specimen B, 24 gauge (.026") Galvalume Metal Roof Panels over 3-1/2" x 8" x .061" Z purlins as shown in MRS System 2000 dwg 1 - 4. The edge and the ends of the panels were attached to the purlins with self drilling screws.

Configuration: Specimens Mounted vertically in steel test chamber
Specimen A, (2) 5' purlin spans, 4 panels wide
Specimen B, (4) 1' purlin spans, 4.5 panels wide

Description of Units:

Specimens A, B

Panel Construction- 24 ga (.026") Galvalume steel roof panels 16" wide with 1-3/4" interlocking standing seams per MRS System 2000 dwg 1 - 4. Specimen A -138" long, Specimen B - 72" long

Purlin Construction- 3-1/2" x 8" x 16 ga (.061") Z purlins

Purlin Spacing- Specimen A 2 spans 60" OC with 8" overhang.
Specimen B 4 spans 12" OC with 12" over hang

Screws and Method of Attachment-
Purlins- 18 ga clips attached to purlins with 2 self drilling screws as shown in drawing.

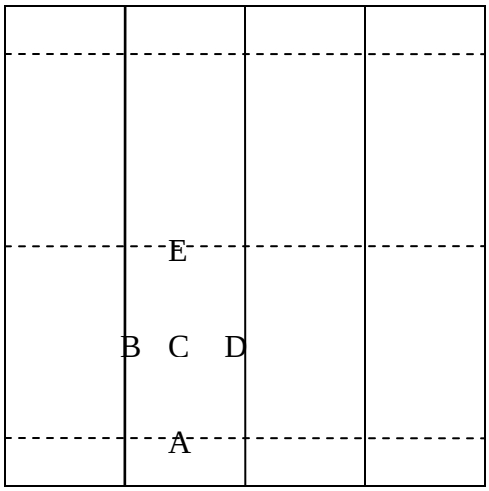
Panel Standing Seams- Overlaps were 16" OC and panels were attached with 18 ga clips at each purlin as shown in drawing.

Purlin Attachment- Each purlin was attached to the chamber.

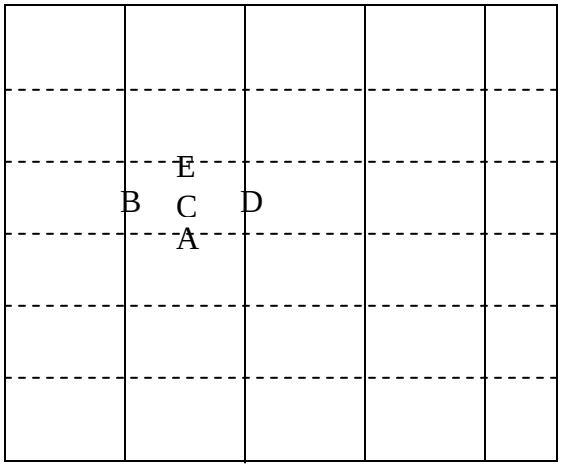
Test Specimens

Indicator Locations

Specimen A



Specimen B



*Drawings not to scale.

Specimen A

Deflections in inches

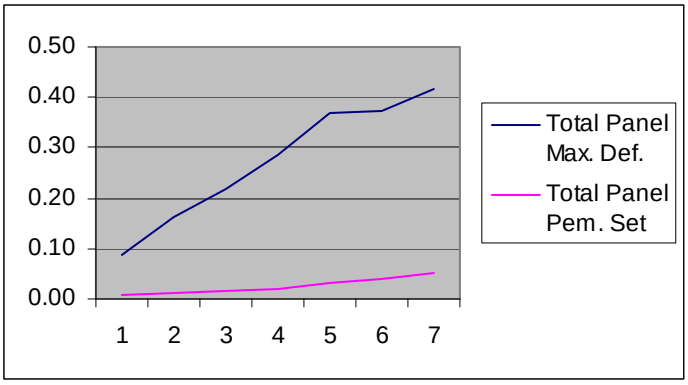
Pressure Increments psf Positive	Time (sec)	End Purlin Between Ribs (A)	Perm. Set	Mid-Span Rib (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60						
8	60	.05"	.08"	.01"	.00"	.09"	.01"
12	60	.09"	.08"	.03"	.00"	.16"	.01"
16	60	.11"	.08"	.04"	.00"	.22"	.01"
24	60	.12"	.10"	.06"	.01"	.28"	.02"
28	60	.14"	.10"	.09"	.01"	.37"	.03"
32	60	.14"	.11"	.09"	.01"	.37"	.04"
36	60	.15"	.10"	.11"	.02"	.48"	.05"

Deflections in inches

Pressure Increments	Time (sec)	Mid Span Rib (D)	Perm Set	End Span Purlin mid panel (E)	Perm. Set	Total Panel Deflection	Total Panel Perm. Set
*RZ 5.6	60						
8	60	.02”	.01”	.01”	.01”	.09”	.01”
12	60	.05”	.02”	.03”	.01”	.16”	.01”
16	60	.08”	.03”	.03”	.01”	.22”	.01”
24	60	.11”	.04”	.04”	.02”	.28”	.02”
28	60	.15”	.03”	.06”	.02”	.37”	.03”
32	60	.15”	.05”	.06”	.02”	.37”	.04”
36	60	.18”	.07”	.07”	.02”	.42”	.05”

***Note:** RZ (Reference Zero pressure) is to compensate for vertical test position.
Note: C indicator reading is used as Total Panel Deflection and Permanent Set.

Positive Side Graph



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Observations: Deflections increased as pressure increased. No fastener failure occurred.

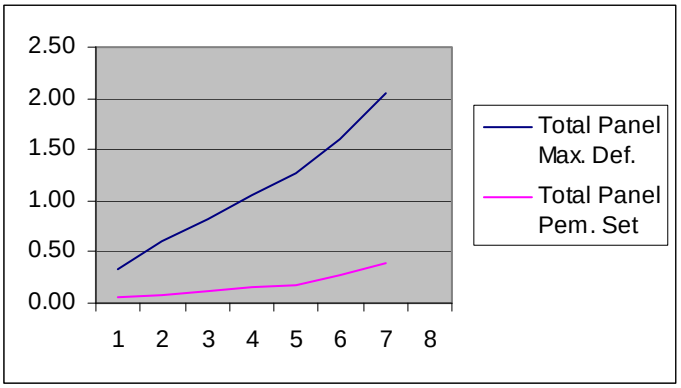
Deflections in inches

Pressure Increments psf Negative	Time (sec)	End Purlin Between Ribs (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60						
8	60	.03”	.01”	.12”	.05”	.33”	.05”
16	60	.06”	.01”	.17”	.09”	.61”	.08”
24	60	.07”	.02”	.32”	.12”	.83”	.11”
32	60	.10”	.02”	.42”	.17”	1.05”	.15”
40	60	.12”	.03”	.56”	.20”	1.26”	.18”
48	60	.13”	.04”	.87”	.27”	1.61”	.28”
56	60	.17”	.07”	1.30”	.33”	2.05”	.40”

Pressure Increments psf Negative	Time (sec)	Mid Span (D)	Perm Set	End Span Purlin mid panel (E)	Perm. Set	Total Panel Deflection	Total Panel Perm. Set
*RZ 5.6	60						
8	60	.11”	.03”	.40”	.06”	.33”	.05”
16	60	.19”	.05”	.73”	.16”	.61”	.08”
24	60	.28”	.07”	.10”	.17”	.83”	.11”
32	60	.39”	.14”	1.23”	.23”	1.05”	.15”
40	60	.56”	.16”	1.5”	.31”	1.26”	.18”
48	60	.75”	.19”	1.95”	.46”	1.61”	.28”
56	60	1.07”	.27”	2.48”	.53”	2.05”	.40”

***Note:** RZ (Reference Zero pressure) is to compensate for vertical test position.
Note: C indicator reading is used as Total Panel Deflection and Permanent Set.

Negative Side Graph



Observations- Deflections increased as pressure increased. Fastener failure occurred at approximately 57 to 58 psf. The panel disengaged from the clips.

Specimen B

Deflections in inches

Pressure Increments psf Positive	Time (sec)	Purlin Mid Panel (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60						
12	60	.02	.01	.03	.02	.01	0
24	60	.03	.01	.04	.02	.03	0
36	60	.03	.01	.05	.03	.04	0
48	60	.03	.01	.06	.03	.05	0
60	60	.03	.01	.07	.03	.06	0
72	60	.03	.01	.07	.03	.07	0
84	60	.03	.00	.08	.03	.08	.0
96	60	.03	.00	.08	.03	.10	.0

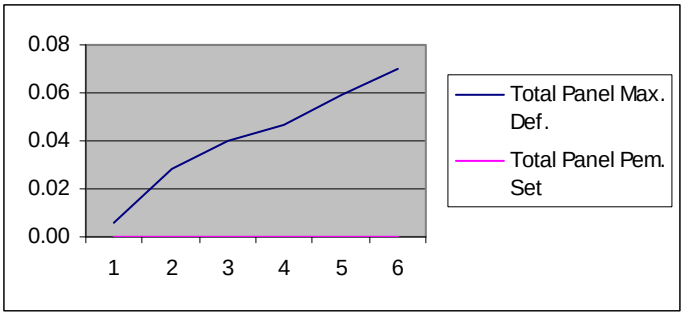
Deflections in inches

Pressure Increments psf Positive	Time (sec)	Mid Span (D)	Perm Set	Purlin mid panel (E)	Perm. Set	Total Panel Deflection	Total Panel Perm. Set
RZ 5.6	60						
12	60	.03	.02	.02	.01	.01	0
24	60	.04	.02	.03	.01	.03	0
36	60	.05	.03	.04	.01	.04	0
48	60	.06	.03	.05	.02	.05	0
60	60	.07	.03	.05	.02	.06	0
72	60	.07	.03	.06	.02	.07	0
84	60	.08	.03	.06	.02	.08	.0
96	60	.08	.03	.06	.03	.10	.0

***Note:** RZ (Reference Zero pressure) is to compensate for vertical test position.
Note: C indicator reading is used as Total Panel Deflection and Permanent Set.

Observations- Deflections increased as pressure increased. No fastener failure occurred.

Positive Side Graph



Deflections in inches

Pressure Increments psf Negative	Time (sec)	Purlin Mid Panel (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
RZ 5.6	60						
21	60	.16	.04	.06	.01	.15	.06
42	60	.26	.05	.08	0	.25	.25
63	60	.36	.08	.10	0	.34	.09
84	60	.44	.07	.11	0	.41	.09
105	60	.51	.08	.11	.01	.48	.09
126	60	.56	.08	.12	.01	.53	.09
147	60	.65	.10	.13	.02	.59	.09
168	60	.70	.11	.13	.03	.67	.09
189	60	.78	.11	.15	.03	.72	.09
210	60	.90	.12	.20	.03	.84	.10

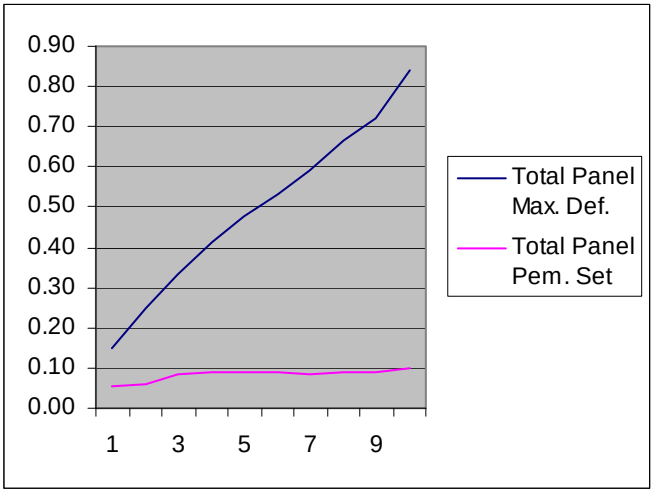
Deflections in inches

Pressure Increments psf Negative	Time (sec)	Mid Span (D)	Perm Set	Purlin Mid Panel (E)	Perm. Set	Total Panel Deflection	Total Panel Perm. Set
RZ 5.6	60						
21	60	.10	.05	.17	.09	.15	.06
42	60	.14	.06	.32	.15	.25	.25
63	60	.18	.07	.41	.17	.34	.09
84	60	.22	.08	.49	.18	.41	.09
105	60	.24	.08	.56	.19	.48	.09
126	60	.28	.09	.61	.19	.53	.09
147	60	.32	.09	.68	.20	.59	.09
168	60	.35	.11	.74	.20	.67	.09
189	60	.38	.12	.80	.20	.72	.09
210	60	.43	.13	.92	.21	.84	.10

***Note:** RZ (Reference Zero pressure) is to compensate for vertical test position.
Note: C indicator reading is used as Total Panel Deflection and Permanent Set.

Observations- Deflections increased as pressure increased. No fastener failure occurred.

Negative Side Graph



Note: 2 mil polyethylene film was used for the ASTM 1592 test, it is the opinion of the undersigned that it had no influence on the results of the test.

Observers-

Keith Owen / ATL
Eddie Lance, Josh Thomas / ATL
Jeremiah Buechner / Metal Roofing Systems
Andy Sigmon / Metal Roofing Systems
Brian Thompson / Metal Roofing Systems
David W. Johnson, P.E

Keith Owen, Lab Manager
American Test Lab, Inc.
Keith Owen
6/21/12

All Tests Witnessed and Certified by:
David Johnson P. E.
1656 Calvert Rd.
Brevard, NC 28712
Florida P.E. # 00061915

Engineer Seal And Signature

David Wesley Johnson
6/21/12

Certificate of Independence: The witnessing engineer has no equity interest in American Test Lab of North Carolina, Metal Roofing System or their parts vendors. Witnessing engineer is in complete compliance of Florida Statue 9B-72, Section 72.110

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MRS SYSTEM 2000	Date: May 24, 2012	1 dwg 1 of 4

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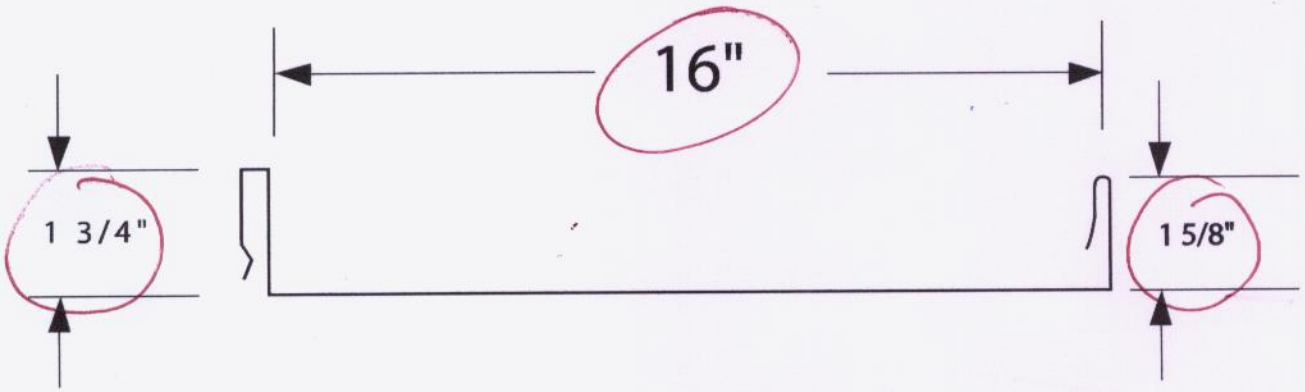
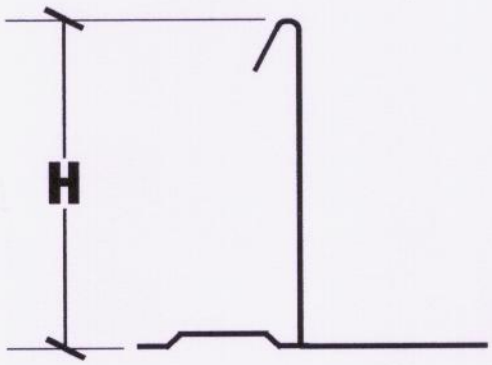
DATE 6/21/12
REPORT NO. ATLNC 052101-12
Kurt Owen
ATL INSPECTOR



24 GA. SYSTEM 2000 SSMR PANEL

H = 1-7/8"
W = 2-1/4"



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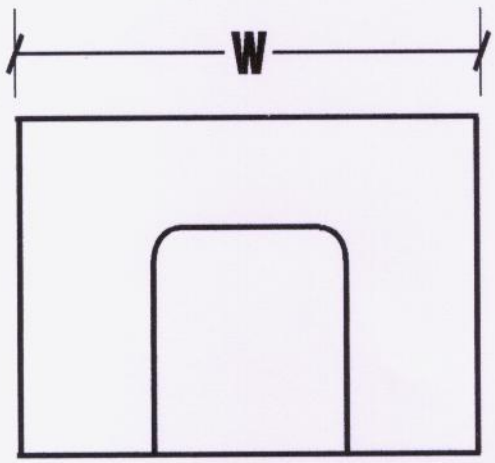
CLIP SIDE VIEW

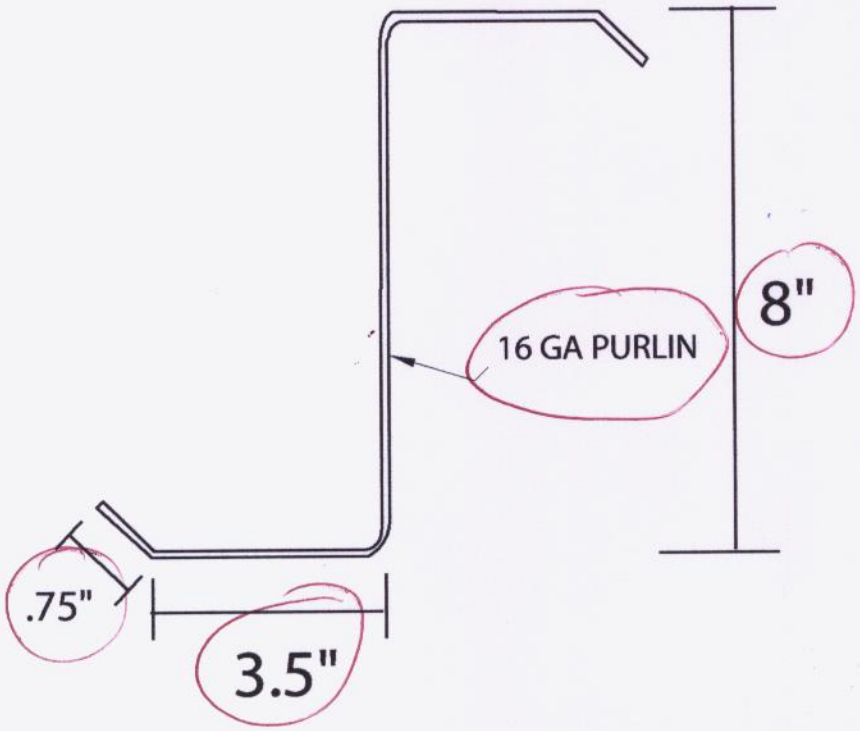
H = 1-7/8"
W = 2-1/4"



CLIP FRONT VIEW

SYSTEM 2000 CLIP

16 GA Z PURLIN	Date: May 24, 2012	3 dwg 3 of 4



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REPORT NO. ATLNC 0521.01-12
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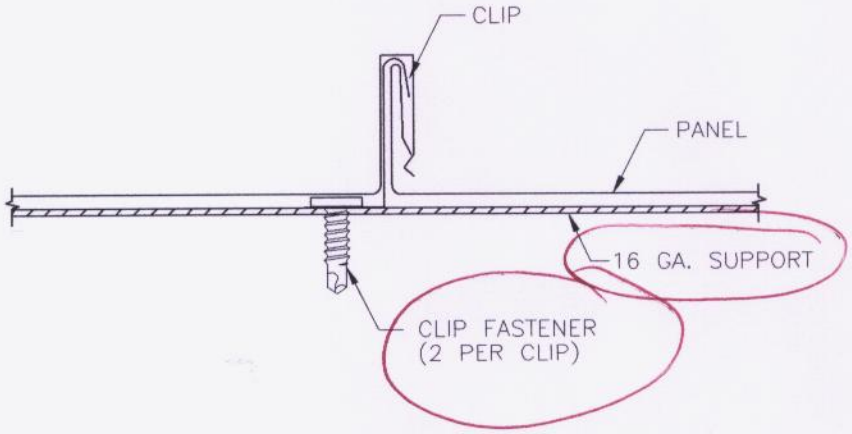
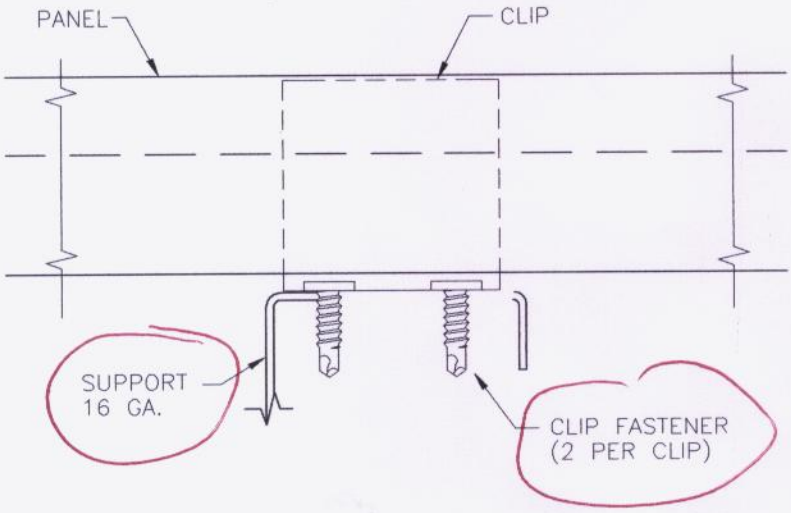
MRS SYSTEM 2000 TEST SETUP	Date: May 24, 2012	4 dwg 4 of 4



CLIP SECTION VIEW



CLIP SIDE VIEW

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ATL INSPECTOR