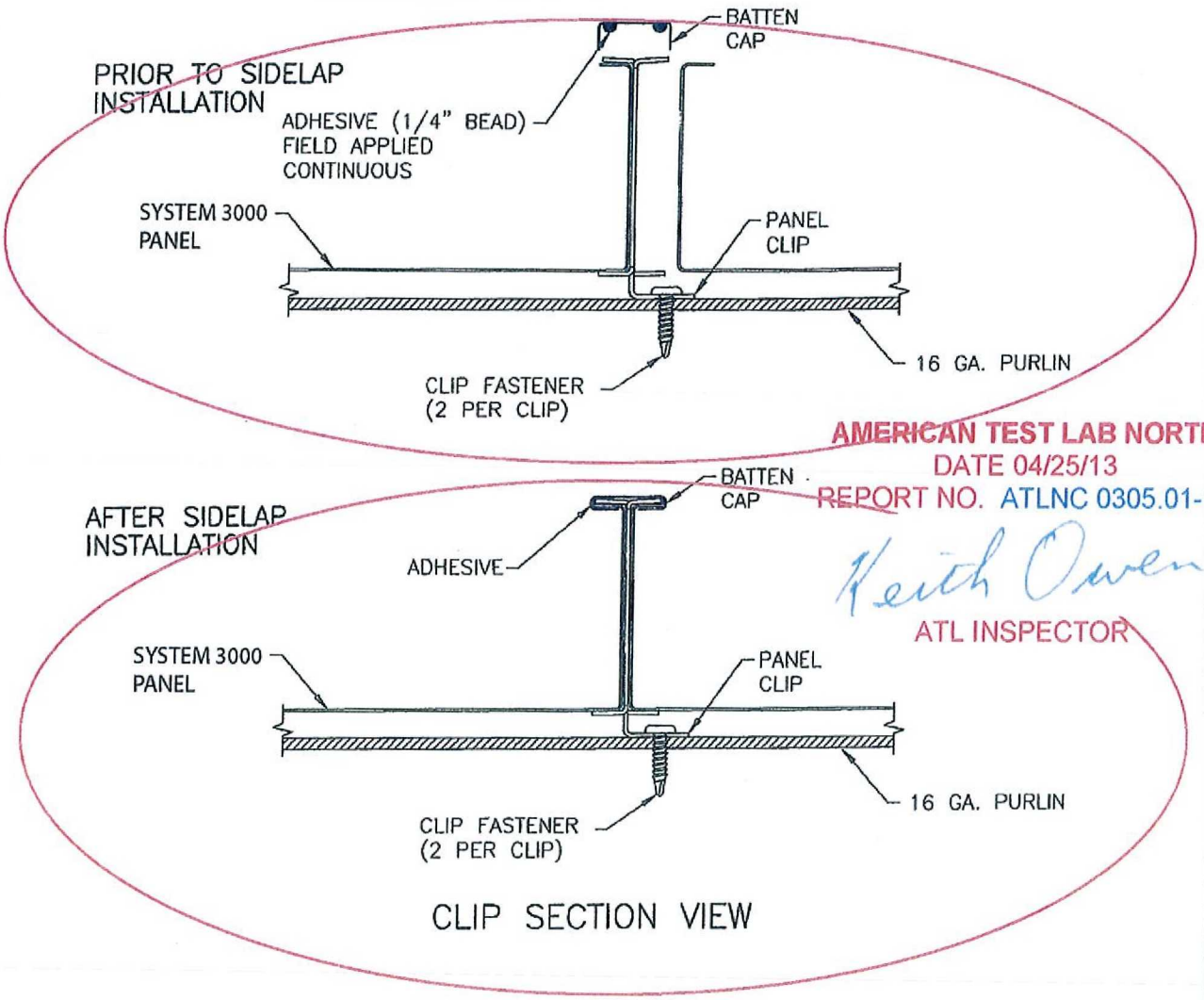
METAL ROOFING
Systems, Inc

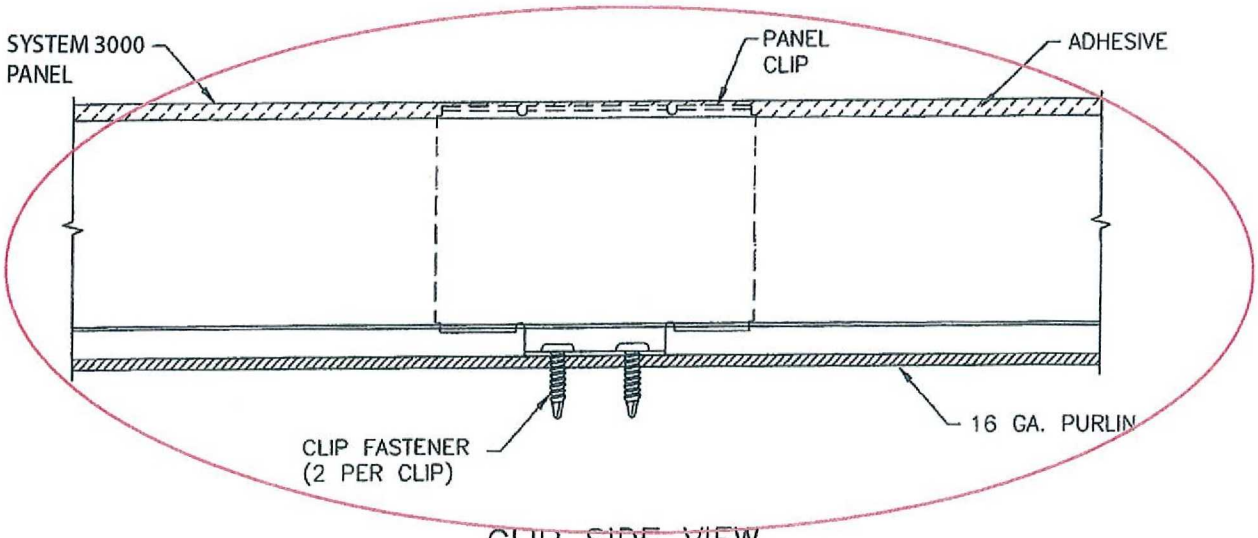
MRS SYSTEM 3000
TEST PANEL



CLIP SECTION VIEW

AMERICAN TEST LAB NORTH
DATE 04/25/13
REPORT NO. ATLNC 0305.01-13

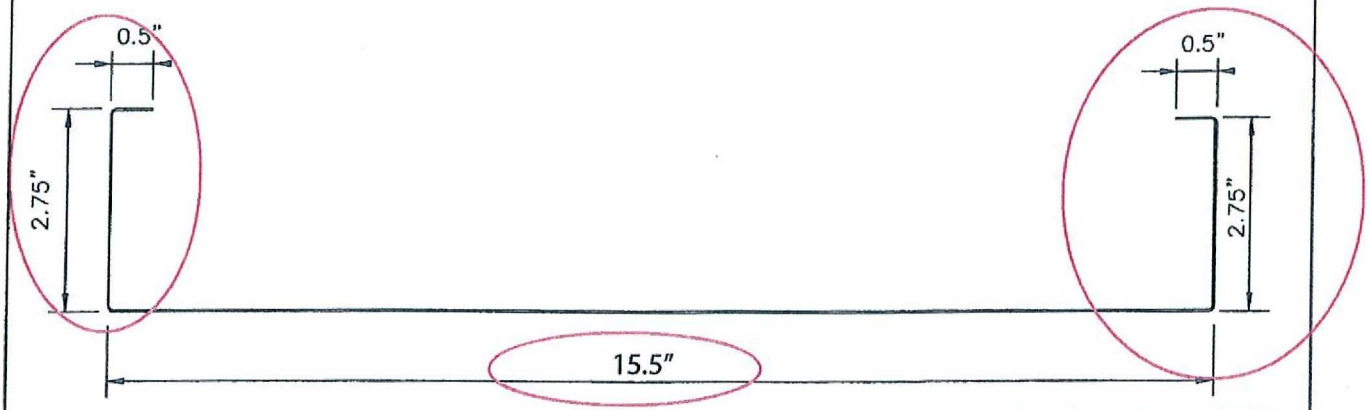
Keith Owen
ATL INSPECTOR



CLIP SIDE VIEW

METAL ROOFING
Systems, Inc

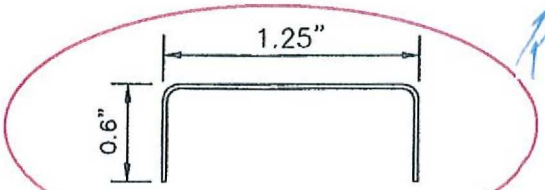
MRS SYSTEM 3000
TEST PANEL



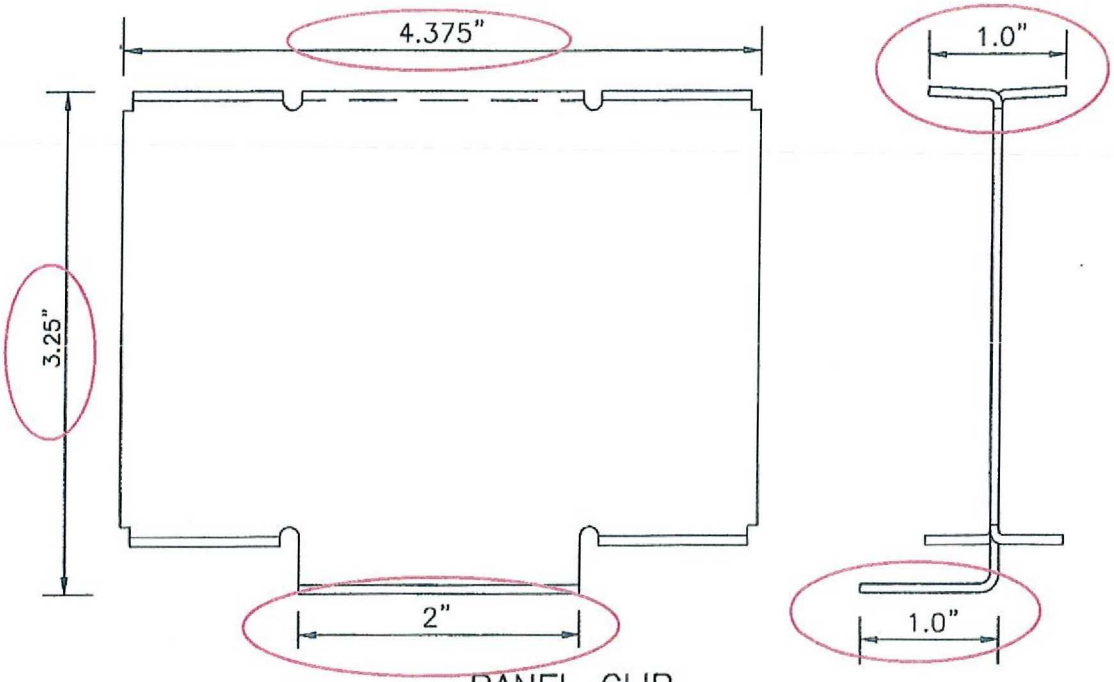
MRS SYSTEM 3000 PANEL
(24 GA. PANEL)

AMERICAN TEST LAB NORTH
DATE 04/25/13
REPORT NO. ATLNC 0305.01-13

Keith Owen
ATL INSPECTOR



PANEL CAP
(24 GA.)



PANEL CLIP
(0.062" THICK)

American Test Lab, Inc.
1656 Calvert Road, Brevard, N. C. 28712
Phone (828) 884-3700 Fax (828) 884-3710
Web www.atlnc.com E-Mail atli@citcom.net

ATLNC # 0305.01-13 Report Date: 04/25/13

Test Date: 03/06/2013

IAS Certification # TL-423
Miami Dade Certification # 08-0227.14
FL Organizational # TST 1555

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

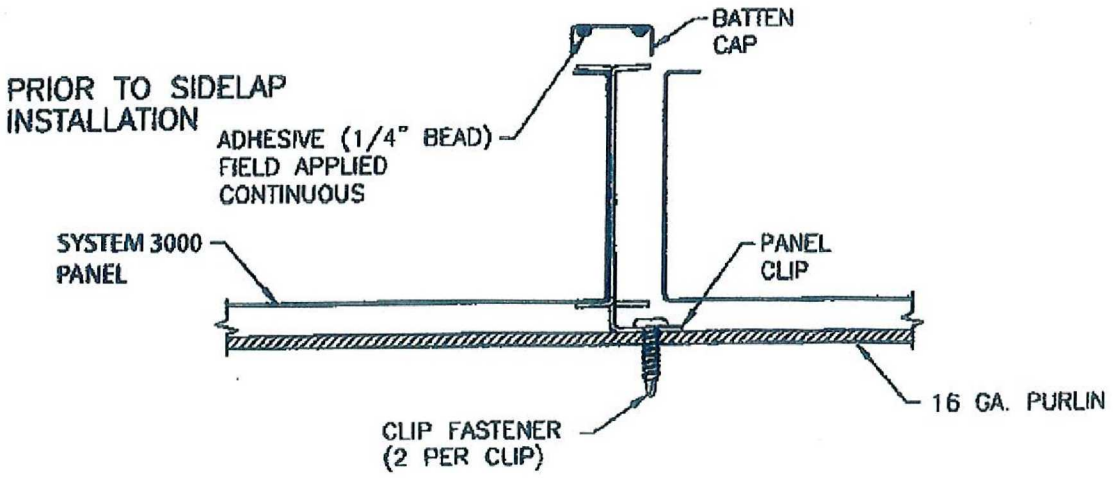
Test Standards: ASTM E 1592-05, ASTM E1646, E1680

Test Conditions: 65 - 75 degrees F

Description of product tested:

Specimens A, B, 24 gauge (.026") Galvalume Metal Roof Panels as shown in MRS System 3000 dwg 1 – 2 over 3-1/2" x 8" x 16 ga. (061") Z purlins. Batten caps were mechanically crimped over the seams. Adhesive was along both sides of the batten cap. The ends of the panels were attached together with self drilling screws.

Specimen C, 24 gauge (.026") Galvalume Metal Roof Panels as shown in MRS System 3000 dwg 1 – 2 over 3-1/2" x 8" x 16 ga. (061") Z purlins. Batten caps were mechanically crimped over the seams. Adhesive was along both sides of the batten cap



Configuration:

Specimen A, (2) 5' purlin spans, 4 panels wide mounted vertically
Specimen B, (4) 1' purlin spans, 4.5 panels wide mounted vertically
Specimen C, (1) 5' span, (1) 4' span, 3.75 panels wide mounted horizontally

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

Purlin Spacing- Specimen A 2 spans 60" OC with 12" overhang.
Specimen B 4 Spans 12" OC with 12" overhang.
Specimen C, (1) 5' span, (1) 4' span with 6" overhang

Screws and Method of Attachment-

Purlins- 4-3/8" wide x 3-1/4" high x 22 ga fixed clips as shown in drawing attached to purlins with 2 self drilling screws.

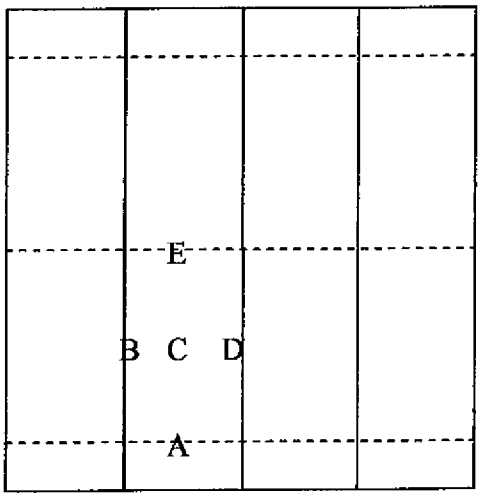
Panel Standing Seams- Seam were 15-7/8" OC and panels were joined with 22 ga fixed clips at each purlin as shown in drawing.

Purlin Attachment- Each purlin was attached the chamber.

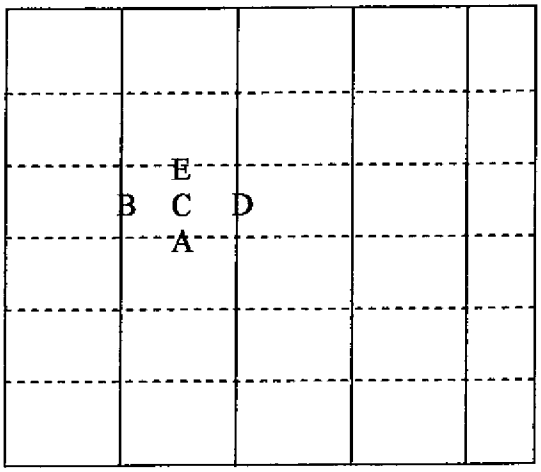
Test Specimens

Indicator Locations

Specimen A



Specimen B



Specimen A

Deflections in inches

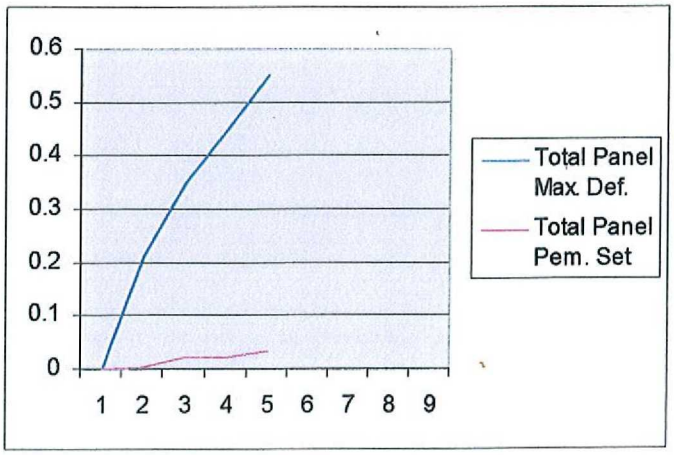
Pressure Increments psf Positive	Time (sec)	End Purlin Between Ribs (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60	0.0	0.0	0.0	0.0	0.0	0.0
15	60	.031	.007	.050	.012	.210	.004
30	60	.048	.004	.087	.021	.347	.024
45	60	.061	.005	.123	.029	.450	.024
60	60	.078	.008	.166	.043	.548	.034

Deflections in inches

Pressure Increments psf Positive	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	0.0	0.0	0.0	0.0	0.0	0.0
15	60	.074	.014	.064	.010	.210	.004
30	60	.144	.039	.106	.025	.347	.024
45	60	.209	.034	.136	.044	.450	.024
60	60	.280	.087	.181	.059	.548	.034

***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



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

Deflections in inches

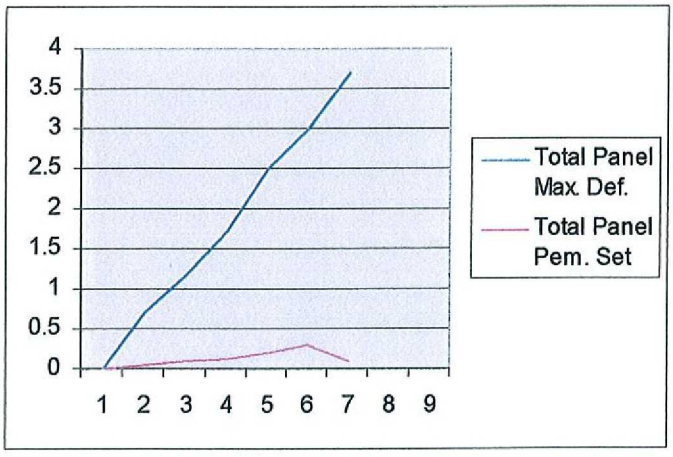
Pressure Increments psf Negative	Time (sec)	End Purlin Between Ribs (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60	0	0.0	0.0	0.0	0.0	0.0
15	60	.44	.01	.19	.03	.71	.04
30	60	.59	.03	.34	.06	1.17	.09
45	60	.70	.07	.56	.1	1.72	.13
60	60	1.70	0	1.11	.21	2.49	.21
75	60	1.81	.16	1.15	.25	3.00	.30
90	60	2.32	.52	1.50	.27	3.71	.09

Deflections in inches

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	0.0	0.0	0.0	0.0	0.0	0.0
15	60	.21	.06	.38	.07	.71	.04
30	60	.37	.13	.58	.11	1.17	.09
45	60	.57	.17	.87	.13	1.72	.13
60	60	.95	.26	1.58	.25	2.49	.21
75	60	.96	.27	2.55	.30	3.00	.30
90	60	1.07	.29	3.56	.22	3.71	.09

***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. The panels failed at approximately 101 psf.

Specimen B

Deflections in inches

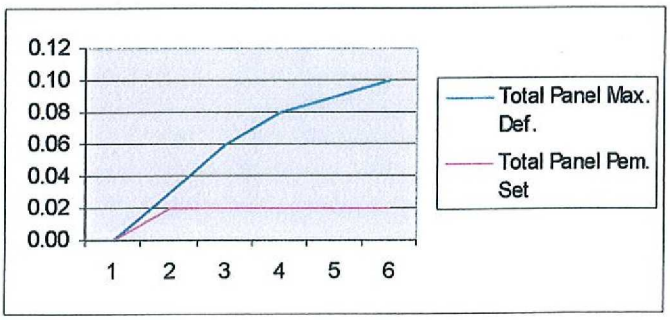
Pressure Increments psf Positive	Time (sec)	Purlin Mid Panel (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60	0.0	0.0	0.0	0.0	0.0	0.0
15	60	.02	.00	.01	.01	.03	.02
30	60	.02	0	.03	.02	.06	.02
45	60	.03	0	.05	.01	.08	.02
60	60	.04	0	.08	.02	.09	.02
75	60	.06	0	.11	.02	.10	.02

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	0.0	0.0	0.0	0.0	0.0	0.0
15	60	.03	.02	.01	0.0	.03	.02
30	60	.04	.04	.01	0.0	.06	.02
45	60	.06	.06	.02	0.0	.08	.02
60	60	.07	.02	.02	0.0	.09	.02
75	60	.07	.03	.03	0.0	.10	.02

***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



Deflections in inches

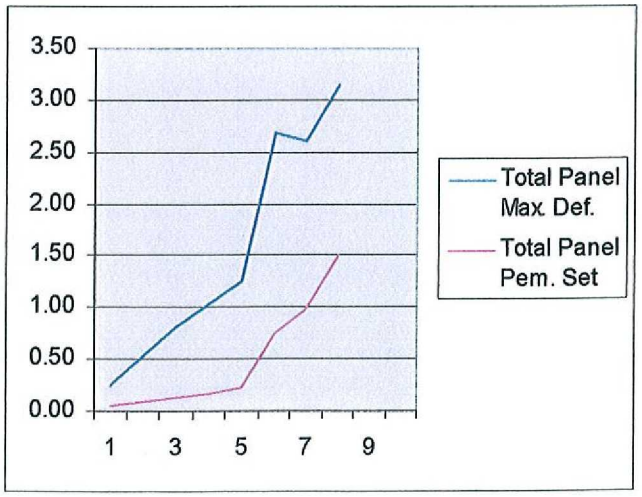
Pressure Increments psf Negative	Time (sec)	Purlin Mid Panel (A)	Perm. Set	Mid-Span (B)	Perm. Set	Mid-Span (C)	Perm. Set
*RZ 5.6	60	0.0	0.0	0.0	0.0	0.0	0.0
25	60	.12	.12	.02	.00	.26	.05
50	60	.21	.20	.04	.01	.55	.09
75	60	.35	.26	.07	.01	.81	.14
100	60	.91	.09	.07	0	1.04	.18
125	60	1.14	.13	.24	0	1.25	.23
150	60	2.43	.84	.09	0	2.69	.76
175	60	2.72	1.13	.14	.06	2.61	.99
200	60	3.20	1.68	.30	.11	3.16	1.50

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	0.0	0.0	0.0	0.0	0.0	0.0
25	60	.02	0	.24	.07	.26	.05
50	60	.06	0	.54	.12	.55	.09
75	60	.09	.01	.81	.19	.81	.14
100	60	.13	.02	1.05	.27	1.04	.18
125	60	.19	.01	1.25	.32	1.25	.23
150	60	.37	.05	2.02	.56	2.69	.76
175	60	.31	.05	2.25	.72	2.61	.99
200	60	1.35	.18	2.87	1.13	3.16	1.50

***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. No fastener failure occurred.

Specimen C

AIR INFILTRATION TEST
ASTM E1680-11

Tested @ psf	Air Infiltration CFM/Sq. Ft.
1.57	.1

WATER INFILTRATION TEST
TAS 202, ASTM E1646-95

Design Pressure	psf Load	Results
	20	Passed

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
Sam Poplin, Josh Thomas, Keith Owen Jr. / ATL
Jeremiah Buecher / Metal Roofing Systems
Andy Sigmon / Metal Roofing Systems
Brian Thompson / Metal Roofing Systems
David W. Johnson, P.E

Keith Owen, Lab Director
American Test Lab, Inc.
Keith Owen
4/25/13

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
4/25/13

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

Disclaimer:

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