



Farabaugh Engineering and Testing Inc.

Project No. T161-19

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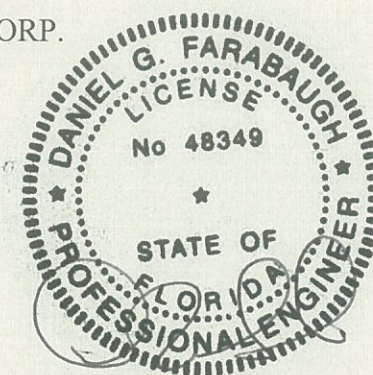
ASTM E-1680 AIR LEAKAGE TEST
ASTM E-1646 WATER PENETRATION TEST

ON

**T-PANEL - METAL ROOF PANEL
16" WIDE X 24 GA. STEEL
WITH INTERMITTENT CLIPS**

FOR

PETERSEN ALUMINUM CORP.
10551 PAC ROAD
TYLER, TX. 75707



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Project No. T161-19

AIR LEAKAGE AND WATER PENETRATION TESTING

Purpose

The purpose of this test is to establish air and water infiltration rates on the Petersen Aluminum Roof Panel System.

Test Date

4/10/19

Test Specimen

Manufacturer: Petersen Aluminum
10551 PAC Rd.
Tyler, TX. 75707

Panel: T-PANEL - Metal Roof Panel, 16" wide x 24 ga. steel with 24 ga. steel cap

Intermittent Clip: 6" wide x 16 ga. galvanized steel clip

Testing Apparatus

A vacuum test chamber was used with static pressure taps. A controlled blower provided uniform pressure to the specimen mock-up. Calibrated manometers were used to measure the pressure at each pressure tap.

Installation

- The panels were installed on to 16 ga supports with using (2) #14-13 X 1-1/2" long, DP1, Concealor, self-drill fasteners per intermittent clips at supports. The panel sidejoints used a 24 ga. seam cap and were seamed with a mechanical seamer. The seam cap used 2 beads of factory sealant, one bead on each side of cap corners. The panel ends were fastened with (3) 1/4-14 x 1-1/2 long, self-drill, hex head fasteners with washer. The panels were attached and sealed to the perimeter frame. Test was done with panels in horizontal position (no slope).

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Theory of Procedure

The tests were conducted in accordance with ASTM E-1680-11 “Rate of Air Leakage Through Exterior Metal Roof Panel System”, and ASTM E-1646-95, “Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference” and as provided here-in.

Air Leakage Test Procedure

The test procedure is as per ASTM 1680-11 and as provided herein.

The intermediate support was traversed 3/4” in both directions (from initial location) and returned to initial location. This was done twice for a total of 2 cycles.

A positive preload pressure of 15 psf was applied for 10 seconds. Panels were allowed to recover for a period of 2 minutes. A negative preload pressure of 15 psf was applied for 10 seconds. Panels were allowed to recover for a period of 2 minutes. The positive and negative preload cycle was repeated two additional times for a total of 3 cycles.

Air infiltration rates only were determined at the specified test pressures.

Water Penetration Test Procedure

The rest procedure is as per ASTM 1646-95 and as provided herein.

The intermediate support was traversed 3/4” in both directions (from initial location) and returned to initial location. This was done twice for a total of 2 cycles.

Due to the panels being preloaded during the Air Leakage Test, no additional preload was performed for the Water Penetration Test.

Overflow devices were attached to provide a minimum of 1/2” of water ponding during the test.

A calibrated water spray and uniform pressure loads were applied at the specified rates.

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Ambient Temp. = 60 deg.F

Barometric Pressure = 29.91" Hg

**ASTM E1680
AIR LEAKAGE TEST**

**POSITIVE PRESSURE
(INFILTRATION)**

STATIC PRESSURE DIFFERENTIAL (PSF)	AIR LEAKAGE RATE (CFM/SF)
+6.24	0.017
+15.0	0.022

**NEGATIVE PRESSURE
(EXFILTRATION)**

STATIC PRESSURE DIFFERENTIAL (PSF)	AIR LEAKAGE RATE (CFM/SF)
+6.24	0.020
+15.0	0.030

Results:

As a result of the test pressures, the test specimen exhibited air leakage rates as shown on the above table.

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**ASTM E-1646
WATER PENETRATION TEST**

Panel Surface Temperature Prior To Test: 57 deg. F

Panel Surface Temperature During Test: 53 deg. F

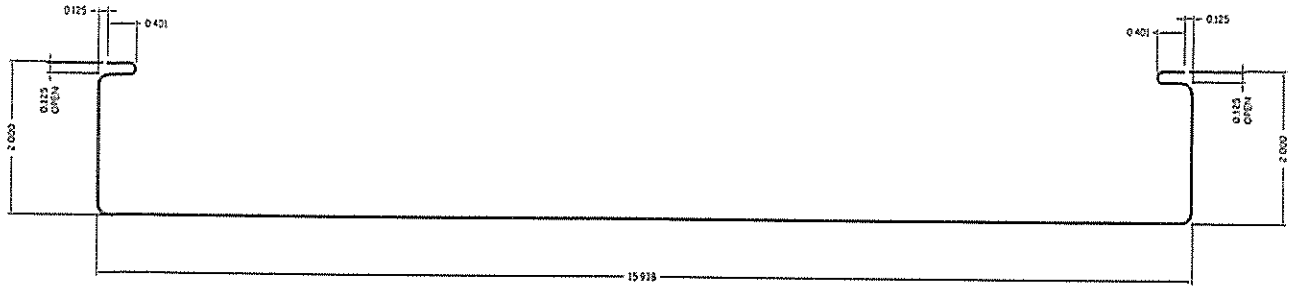
**POSITIVE PRESSURE
(INFILTRATION)**

STATIC PRESSURE DIFFERENTIAL (PSF)	WATER SPRAY RATE (GAL/HR/SF)	TEST DURATION (MIN)	WATER INFILTRATION
+15.0	5	15	None
+20.0	5	15	None
+30.0	5	15	None

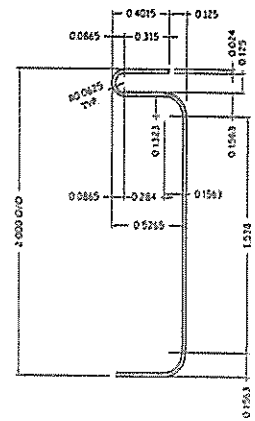
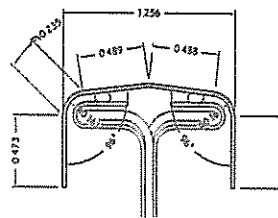
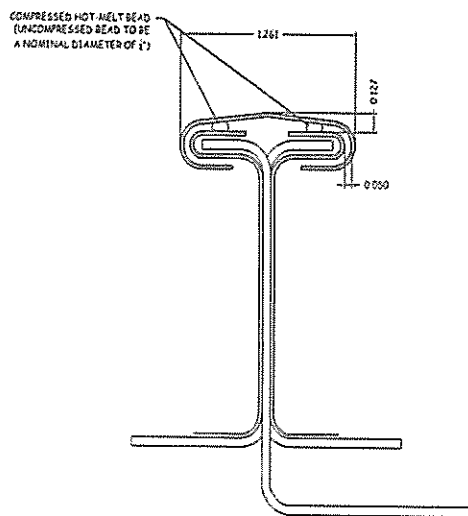
Results:

As a result of the test pressures, the test specimen exhibited no water penetration as shown on the above table.

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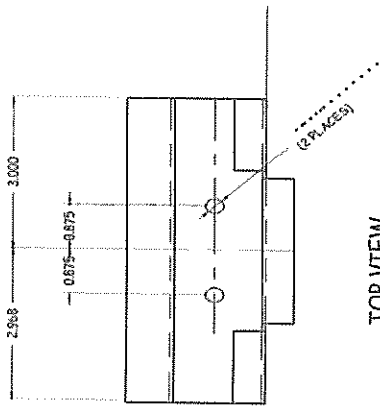
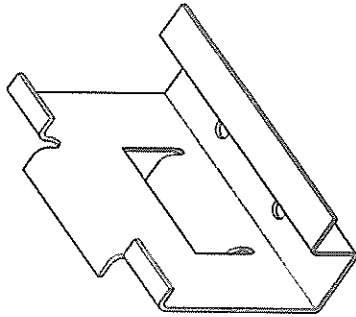


16" T PANEL

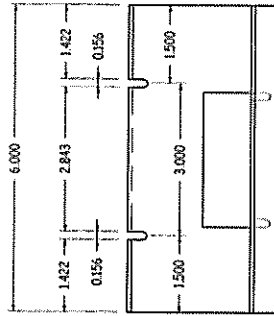


ENLARGED SIDE JOINT DETAIL

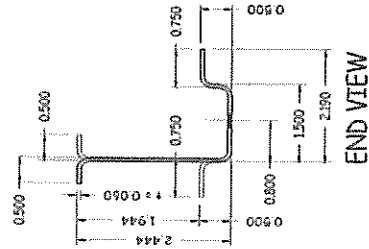
STUDY AT SIDE JOINT W/ CLIP CAP (AFTER SEAMING)



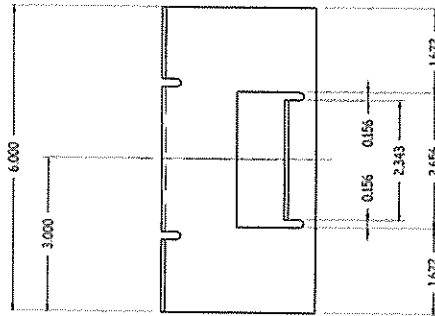
TOP VIEW



FRONT VIEW



END VIEW



REAR VIEW

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Phone: (626) 449-6389
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PETTERSON
PETERSEN ALUMINUM CORPORATION

PART NUMBER		T PANEL INTERMITTENT CLIP	
DATE	5-22-2017	DRAWN	DB1
REV	3	CHECKED	MS
REVISION			

TEST SET-UP

