PRI Construction Materials Technologies LLC

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Laboratory Test Report

Report for:	Petersen Aluminum 1234 Gardiner Lane Louisville, KY 40213
Product Name(s):	0.032" Aluminum 16" - Board and Batten Wall Panels
Project No.:	2651T0006A
Date(s) Tested:	April 11th – 17th, 2024
Test Methods:	TAS 202 (ASTM E330) & TAS 203 & ASTM A370 (Tensile)
MD Notification:	PRI2420599
Results Summary:	Wind Load Resistance: +100/-84psf

Purpose:

Evaluate the wind load resistance, and tensile strength of the Petersen Aluminum's 0.032" aluminum Board and Batten 16" wall panel cladding system in accordance with Testing Application Standard (TAS) 202 Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure/ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Difference, Testing Application Standard (TAS) 203 Criteria for Testing Products Subject to Cyclic Wind Pressure Loading, and ASTM A370 Standard Test Methods and Definitions for Mechanical Testing of Steel Products

Test Methods:

Testing was completed as described in Testing Application Standard (TAS) 202-94 Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure / ASTM E330-14 (2021) Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Difference, Testing Application Standard (TAS) 203-94 Criteria for Testing Products Subject to Cyclic Wind Pressure Loading, and ASTM A370-21 Standard Test Methods and Definitions for Mechanical Testing of Steel Products. Test methods assigned or referenced include, ASTM E1886 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials, and ASTM E8 Standard Test Methods for Tension Testing of Metallic Materials.

Sampling:

The following materials were received by PRI. All other materials for testing were procured by PRI-CMT through local distribution.

Product	Source	Date	Sampling
16" 0.032" Aluminum Board & Batten Panels #10-13 x 1" GP Concealor Pancake Head Screws	Elg Grove, Village, IL	Feb. 23rd, 2024	Petersen Aluminum

Assembly Detail: The test assemblies were constructed on 56" wide by 96" tall walls, fabricated from nominal 2x12 SYP perimeter framing members with 2x6 SYP wooden intermediate framing members spaced 16" O.C. (See Appendix A for details) The framing was sheathed with nominal 15/32" plywood and attached with 8D nails; 6" O.C. around the perimeter and in the field. Three (3) 2" diameter holes were fabricated in each stud cavity through the sheathing to permit pressurization to the back side of the cladding panels. Polyethylene film and tape was applied between the back of the panels and the plywood sheathing prevent excess air leakage during negative loading. (Film was cut for positive loads.)

System Details: Each assembly was contructed with three full (3) panels, one (1) starter strip (cut from a panel), and one (1) fabricated panel. A 96" length of starter strip was attached to the vertical edge of the assembly with each adjacent panel slid into the corresponding interlock. The starter strip and each panel was attached into the sheathing only with fourteen (14) #10-13 x 1" GP Concealor screws spaced approximately 6-1/2" O.C. into each nail flange slot.

Testing Location: Testing was conducted at PRI-CMT located in Tampa, FL. Verification of testing instrumentation was performed by either an ISO accredited calibration laboratory or by a PRI-CMT representative in compliance with PRI-CMT In-House quality control program governed by ISO/IEC 17025-17.

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Test Results: Conditions at the beginning of testing were 23°C (73°F) with 50% Rh.

Table 1: Results TAS 202 / ASTM E330 Positive Loading.

Test Method	Test Pressure	Allowable		Recorded Measurement[3]	Result[4]
½ Uniform Load Structural TAS 202/E330 ½ Test Load[1,2]	+75 psf	Deflection			
		Report Only	Specimen 1	0.01"	Pass
			Specimen 2	0.01"	
			Specimen 3	< 0.01"	
Uniform Load Deflection TAS 202/E330 Design Pressure[1,2]	+100 psf	Deflection			
		Report	Specimen 1	0.01"	Pass
			Specimen 2	0.02"	
			Specimen 3	0.02"	
		Permanent Set – Allowable = 90% Recovery			
		≤ 0.01"	Specimen 1	< 0.01"	Pass
			Specimen 2	<0.01"	
			Specimen 3	< 0.01"	
Uniform Load Structural TAS 202/E330 Full Test Load[1,2]	+150 psf	Deflection			
		Report Only	Specimen 1	0.01"	Pass
			Specimen 2	0.03"	
			Specimen 3	0.03"	
		Permanent Set – Allowable = 90% Recovery			
		≤ 0.01"	Specimen 1	< 0.01"	Pass
			Specimen 2	< 0.01"	
			Specimen 3	< 0.01"	

Notes:
1. Loads were held for 30 seconds.
2. Tape and polyethylene film were utilized to seal the specimen for excessive air leakage, and in the PRI-CMT witness's opinion did not influence the test results
3. Deflection and permanent set were captured on the midspan of the center panel, the unsupported span measured 16". See Appendix A Sketches for gauge measurement locations.
4. Upon completion of testing the specimen did not have indication of deterioration or incipient failure, such as cracking, fastener loosening, local yielding exceeding 10% over maximum deflection, or loss of adhesive bond.

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Table 2: Results TAS 202 / ASTM E330 Negative Loading.

Loading Data					
Profile	Test Pressure (psf)[1]	Load Duration (sec)	Test Specimen		
			1	2	3
16" 0.032" Aluminum Board & Batten Panels	20	30	Pass	Pass	Pass
	40	30	Pass	Pass	Pass
	60	30	Pass	Pass	Pass
	80	30	Pass	Pass	Pass
	100	30	Pass	Pass	Pass
	110	30	Pass	Pass	Pass
	120	30	Pass	Pass	Pass
	130	30	Pass	Pass	Pass
	140	30	Pass	Pass	Pass
	150	30	Pass	Pass	Pass
	155	30	Pass	Pass	Pass
	160	30	**Fail[2]**	Pass	Pass
	165	30	-	Pass	Pass
	170	30	-	Pass	Pass
	175	30	-	**Fail[2]**	Pass
	180	30	-	-	Pass
	185	30	-	-	**Fail[2]**

Notes:
1. Incremental Pressure Differential loading was specified by the client. Negative pressure only.
2. Failure due to nail flange rupture resulting in panel disengagement/buckle. See Appendix A Photographs.

Average Passing Pressure 3 Specimens[1]	168 PSF
Average Ultimate Failure 3 Specimens[1]	173 PSF

Notes:
1. Individual specimen results did not exceed ±15 of the base three average.

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Table 3: Results Specimens 4 -6 - TAS 203 / E1886

Direction	Pressure Differential	Number of Cycles Completed	Specimen	Max Deflection[1]	Permanent Set[1]	Result[2]
Positive	20 to 50 psf	3500	4	0.01"	< 0.01"	Pass
			5	0.01"	0.01"	Pass
			6	0.01"	< 0.01"	Pass
	0 to 60 psf	300	4	0.01"	< 0.01"	Pass
			5	0.01"	0.01"	Pass
			6	0.01"	0.01"	Pass
	50 to 80 psf	600	4	0.01"	< 0.01"	Pass
			5	0.02"	0.01"	Pass
			6	0.01"	0.01"	Pass
	30 to 100 psf	100	4	0.01"	0.01"	Pass
			5	0.02"	0.01"	Pass
			6	0.02"	0.01"	Pass
Negative	-25 to -84 psf	50	4	1.15"	0.10"	Pass
			5	1.05"	0.11"	Pass
			6	1.26"	0.16"	Pass
	-42 to -67 psf	1050	4	0.48"	0.10"	Pass
			5	0.50"	0.10"	Pass
			6	0.45"	0.12"	Pass
	0 to -50 psf	50	4	0.44"	0.09"	Pass
			5	0.38"	0.09"	Pass
			6	0.29"	0.11"	Pass
	-17 to -42 psf	3350	4	0.08"	0.09"	Pass
			5	0.18"	0.02"	Pass
			6	0.20"	0.04"	Pass

Notes:

1. Deflection and permanent set were captured on the midspan of the center panel, the unsupported span measured 16". See sketch (Assembly 1) in Appendix A for gauge measurement locations.
2. Upon completion of testing the specimen met the requirements outlined in the Florida Building Code section 1626.2.8.

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Table 4: ASTM A379/E8 Results

Physical Properties	Test Method	Results			Requirement
		Tensile Strength	Yield Strength	Elongation @ Break	
Tensile (ksi / %) 3 Samples 8" x 1/2" x Thickness As Received; Rate 0.1 in/min Test @ 73.4±3.6°F;	ASTM A370 ASTM E8	27.1	25.9	14.6	Report

Note(s): None

Statement of Compliance:
Testing was conducted in accordance with methods designated in Testing Application Standard (TAS) 202-94 Criteria for Testing Building Envelop Components Using Uniform Static Pressure, Testing Application Standard (TAS) 203-94 Criterial for Testing Products Subject to Cyclic Wind Pressure Loading, and ASTM E330-14(2021) Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Difference. Upon completion the test samples resisted the wind loading corresponding to +100 & -84 pressure differentials. This report does not constitute certification of this product which may only be granted by the certification program administrator. The laboratory test results presented in this report are representative of the material supplied.

Signed: _____
Timothy Efaw
Manager
Date: 05/20/2024

Signed: _____
ZACHARY R. PRIEST LICENSE No. 74021 STATE OF FLORIDA PROFESSIONAL ENGINEER
Zachary Priest - PE
Director
Date: 05/21/2024

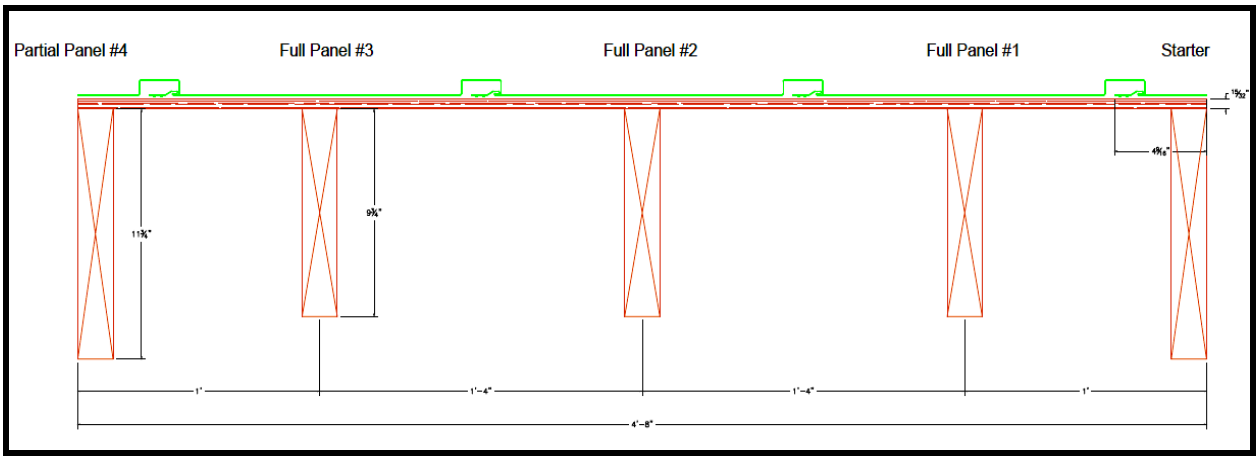
Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	05/20/2024	10	NA

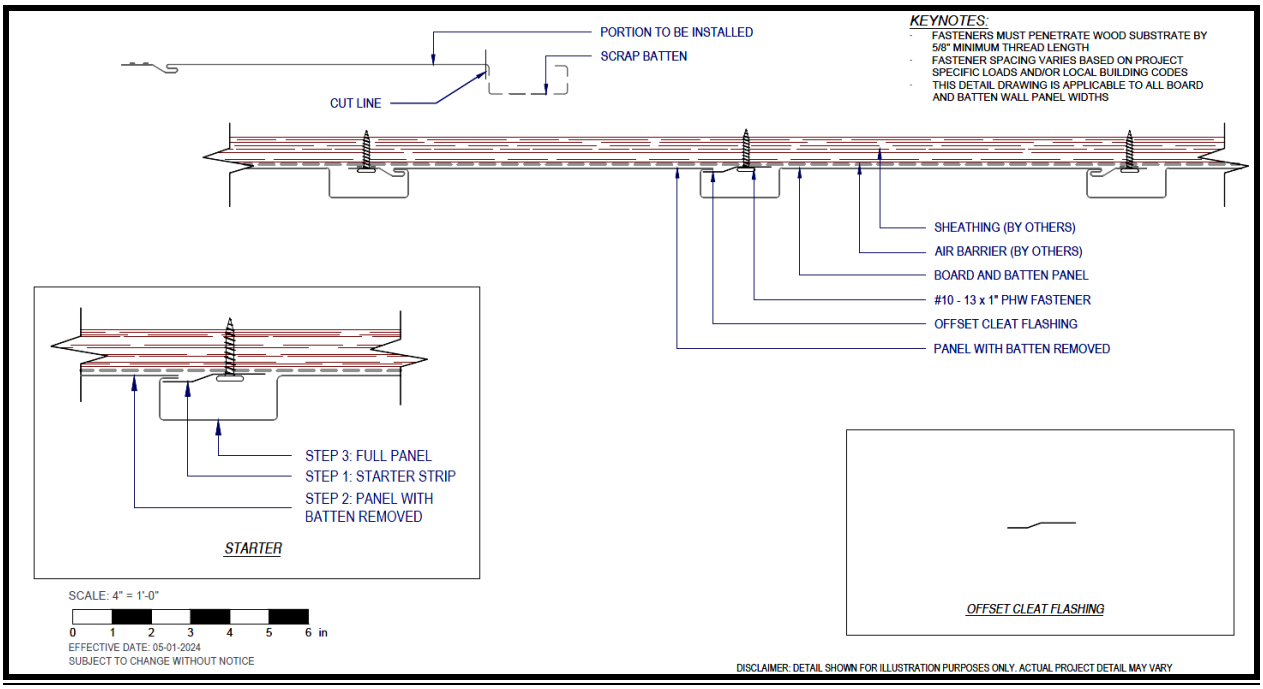
Appendix Follows…

Sketches

Framing Details



Anchoring Details



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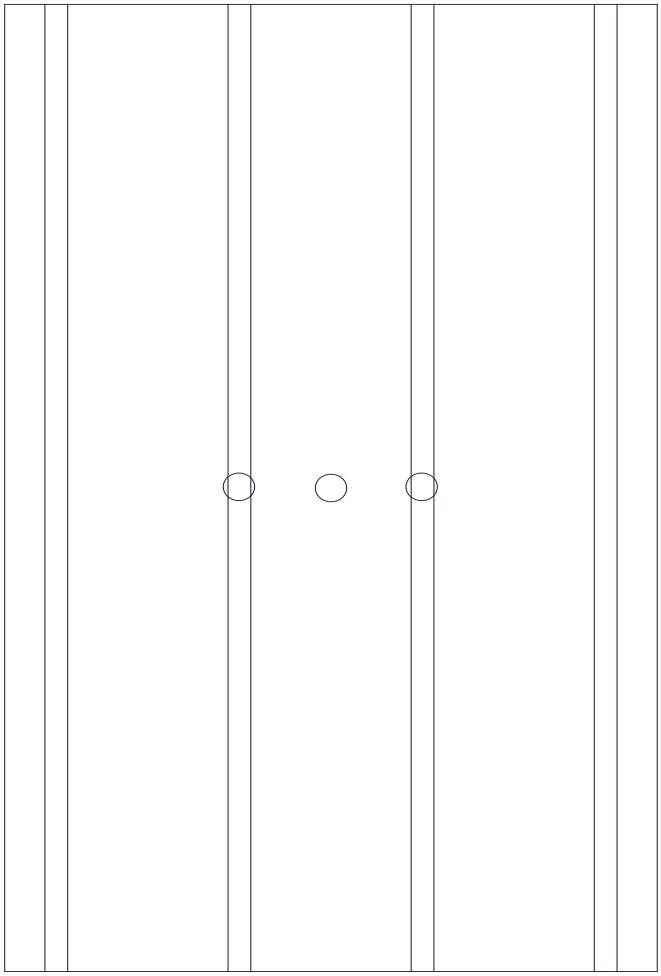
Deflection / Permanent Set Measurement



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Photographs

Assembly Prior to Test (Typical)

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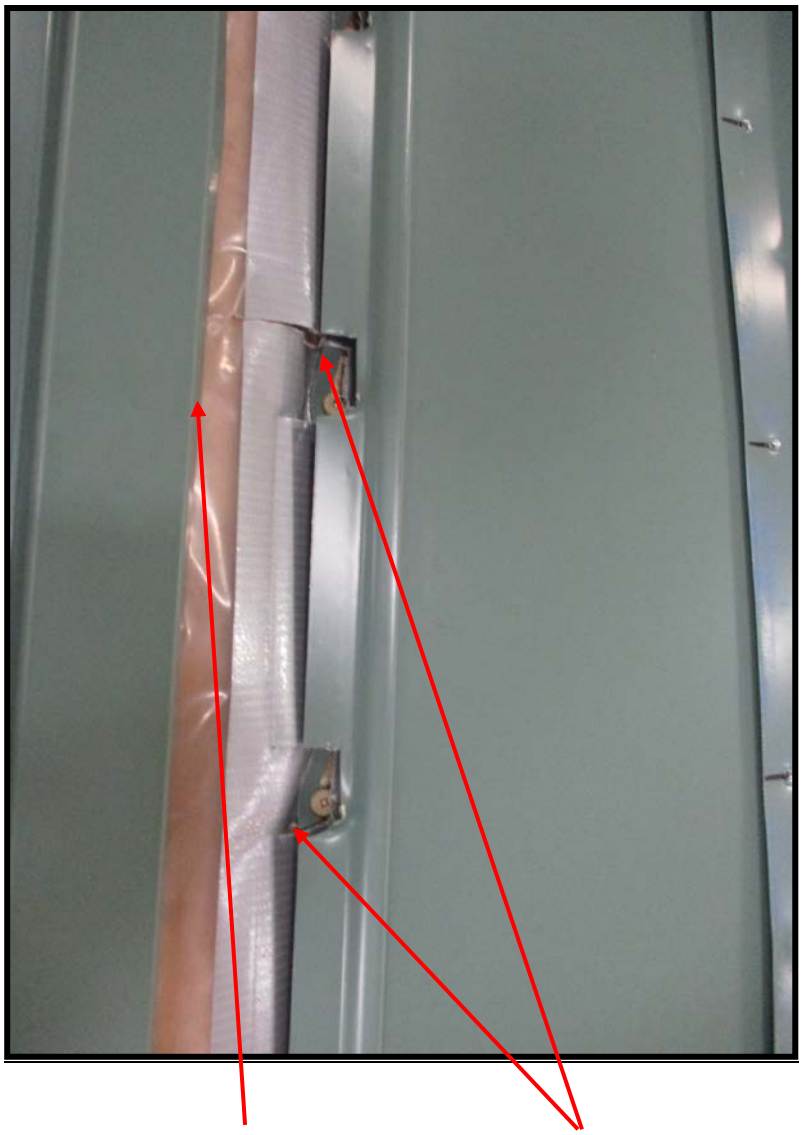
Typical Failure



END OF REPORT