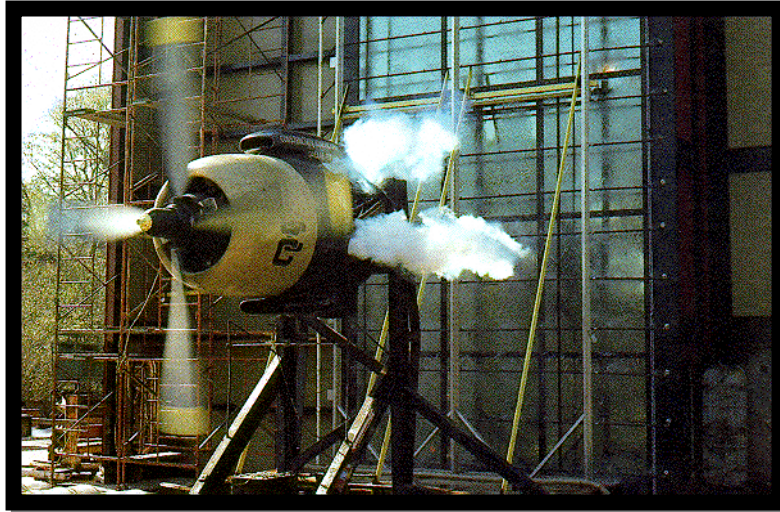




# CONSTRUCTION CONSULTING LABORATORY



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**AAMA 501-15 PERFORMANCE TEST REPORT:**

## **Sky Building Materials**

Series: 1000 Aluminum Storefront

REPORT CCL 23-122

Test Completed: May 19, 2023

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*Prepared for:*



10835 Shady Trail  
Dallas, Texas 75220  
Phone: 972 807 9616

**S-UNITED, INC.**

*A Quality Control Company*



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### APPENDIXES

APPENDIX A: Sky Building Materials Series 1000 Drawings

Referring to drawings in **Appendix A**, this report is not complete unless these drawings are stamped and initialed by **CCL** as illustrated below.

Sheet	Details	Date	Stamped as illustrated
1	Elevation / BOM / Install	9-13-23	Construction Consulting Laboratory 1601 Luna Road Carrollton, Texas 75006 (972) 242-0556
2	Assembly	Not dated	
3	Head	Not dated	
4	Jamb	Not dated	
5	Mullion	Not dated	
6	Horizontal	Not dated	
7	Sill	Not dated	





#### 4. TEST EQUIPMENT

- 4.1. The specimen rough opening is constructed from a 4" x 6" x 3/8" thick steel. The chamber interior is accessed through a single bulkhead door.
- 4.2. Pressure differentials created with reversible pumps for positive/negative loading.
- 4.3. Chamber pressure differentials measured with manometers.
- 4.4. Air infiltration / exfiltration measured with a Meriam laminar flow element and inclined and digital manometers.
- 4.5. Water applied to the specimen from a spray rack equipped with swirl-type nozzles spaced two feet on center in vertical and horizontal directions, which under controlled pressure delivered a minimum of five gallons per square foot per hour on the specimen.
- 4.6. Dynamic winds were generated with a Continental TSIO 550 aircraft engine with a 6ft 2-blade propeller
- 4.7. Structural deflections and permanent set values measured with Celesco string potentiometers.

#### 5. AAMA 501-15 TEST PROCEDURE AND ALLOWABLE

- 5.1. **Uniform Load Pre-Load per ASTM E 330:** Per project specs, there shall be no system failure and deflection of aluminum members at 50% of the Positive and Negative design load.  
**Procedure:** Preload the specimen 10.0 Psf (50% of the positive DP) and maintain load for 10 seconds.
- 5.2. **Air Infiltration per ASTM E 283:** The total amount of air infiltration shall not exceed .06 Cfm/ Ft<sup>2</sup> of the specimen size. Mock-up size 15'-1" wide by 10'-8" high = 152.09 Ft<sup>2</sup> x 0.06 CFM = 9.125 CFM - Allowed  
**Infiltration Procedure:** The specimen shall be covered with 2-mil plastic sheet material and sealed with spray adhesive and duct tape to the chamber perimeter, thus allowing no movement of air through the specimen. The specimen shall be subjected to a positive pressure differential of 6.24 Psf to obtain a leakage rate for the test chamber. The plastic bag shall be removed, and the chamber pressurized to a positive 6.24 Psf to measure total air infiltration. The chamber infiltration shall be subtracted from the total air infiltration resulting in the infiltration rate of the test specimen, **Photo 1**.
- 5.3. **Air Exfiltration per ASTM E 283:** The total amount of air exfiltration shall not exceed .06 Cfm/ Ft<sup>2</sup> of the specimen size. Mock-up size 15'-1" wide by 10'-8" high = 152.09 Ft<sup>2</sup> x 0.06 CFM = 9.125 CFM - Allowed  
**Exfiltration Procedure:** The specimen shall be to a negative pressure differential of -6.24 Psf to obtain a total leakage rate for the specimen and chamber. The specimen infiltration shall be subtracted from the total exfiltration to extrapolate an exfiltration rate of the specimen.
- 5.4. **Static Water Penetration per ASTM E 331:** Per project specifications, there shall be no water penetration while subjected to a static test pressure of 8.0 Psf.  
**Procedure:** Water shall be applied to the specimen at a minimum rate of 5 Gph/Ft<sup>2</sup>, in such a way as to completely cover the exterior face of the specimen. Simultaneously, a specified positive static pressure shall be applied for a minimum period of fifteen (15) minutes, **Photo 2**.
- 5.5. **Dynamic Water Penetration per AAMA 501.1-17:** Per project specifications, there shall be no water penetration while subjected to wind speed of 56 Mph (equivalent to 8.0 Psf).  
**Procedure:** Water shall be applied to the specimen at a minimum rate of 5 Gph/Ft<sup>2</sup>, in such a way as to completely cover the exterior face of the specimen. While simultaneously, a wind-speed equivalent to the project specified static test pressure is applied. The application of wind and water shall be applied for a minimum period of fifteen (15) minutes, **Photo 3**.



5.6. Design Load Deflections per ASTM E 330: Per project specs, there shall be no system failure and deflection of aluminum members at 100% of design load and shall not exceed the following:

Procedure: Preload the specimen 50% of the positive or negative DP. Once set, the indicators shall be set to zero. Positive and or negative loading, a pressure equal to 100% of the DP shall be applied and maintained for 10 seconds per load. Between loads deflection shall be recorded.

Table with 2 columns: Test Specimen Design Criteria and Allowable values for Longest Unsupported Span and Horizontal Span.

5.7. Repeat Air Infiltration per ASTM E 283 at a Positive 6.24 Psf static test pressure.
5.8. Repeat Static Water Penetration per ASTM E 331 at the 8.0 Psf for a duration of 15 minutes.
5.9. Proof Load Residual per ASTM E 330, there shall be no permanent deformation of the aluminum members that exceed 0.02% of span at 150% of design load.

Procedure: The specimen shall be preloaded to 50% of the positive or negative DP. Once set, the indicators shall be set to zero. Positive and or Negative loading, a pressure equal to 150% of the DP shall be applied and maintained for 10 seconds, pressure released, and permanent sets recorded.

Table with 2 columns: Test Specimen Proof Load / Positive 30.0 Psf / Negative 30.0 Psf and Allowable values for Mullion Span and Horizontal Span.

6. Specimen Description

Table with 4 columns: Product Type, Series Model, Mock Up Size, Configuration, SIG Glass, Glass Bite, and Bay 1-4 dimensions.

WEEP ARRANGEMENT: No weep hole at center line of glazing DLO at the exterior face of frame. Continuous subsill, part# 1001.

GLASS TYPE: 25.4mm (1") overall thickness, sealed insulating glass (SIG) constructed of two (2) pieces 6.35mm (1/4") thickness Tempered glass with 12.7mm (1/2" air spacer).

DRY GLAZED GLASS: Glass is exterior glazed and supported on 2" setting blocks (Part # G-2054). Interior wedge gaskets (Part # G-1626) runs through horizontally with vertical gaskets butted and sealed with Sikaflex -1A silicone. Drive-in gaskets (Part # G-1626) at the interior and exterior of glass full perimeter with snap in glass stop (Part# 1003) at the bottom of glazing, exterior face of glass

PERIMETER SEALANT: The frame was perimeter sealed to the chamber steel with one (1) row backer rod and Sikaflex -1A silicone.

ANCHORAGE: Starter sill attached to nominal double 4" x 6" steel buck with 5/16" x 2 1/4" Hex self-tapping screws spaced every 6" inches around opening through flashing, and 12" inches through sill of frame. All screws capped sealed with Sikaflex 1-A. Shim packs to be placed every 10" inches along sides and top.



**INTERNAL SEALANT:** Water diverters at the ends of the intermediate horizontals set in and tooled with silicone. Sub-sill end cap plate at both ends of subsill, end dam set in silicone, sealed to sill end and attached to sill with two (2) part FS-354 #10 x 1"-inch PPH screws silicone cap sealed. Interior, Exterior and Top edge of end dam sealed to chamber steel at the rough opening with backer rod and silicone. Sub sill sealed to frame sill with silicone full span at the interior and exterior face. Mullion filler sealed to mullion prior to snapping at the interior leg up from sill 12" inches. At intermediate split mullion, male part #2508 and female part# 1006, the exterior leg of the male mullion is sealed at the interior and exterior leg up from sill 12". Every Jamb (mullion) member to be capped off with aluminum mullion cap-caulking to go in between jamb and jamb cap to secure seal.

**OTHER FEATURES:** Horizontal-to-vertical mullions are screw spline connected with #10 x 1" PPH screws, two (2) at sill and head to vertical and two (2) at intermediate horizontal to vertical. Two (2) part split mullion using part 1006 and part#1008 at system intermediate mullions and part# 1007 flat filler used to finish jambs. Horizontals consist of part# 2505 attached with Two (2) #10 x 1" PPH screws through vertical mullions and a glass stop part# 2503. Sill horizontal attached to starter sill using self-tapping screws every 12" inches and capped sealed.

## 7. TEST RESULTS

<u>Method</u>	<u>Title of Test</u>	<u>Test Pressure</u>	<u>Measured</u>	<u>Allowed</u>
ASTM E 283	Air Infiltration	Positive 6.24 Psf	0.024 Cfm/ft <sup>2</sup>	0.06 Cfm/ft <sup>2</sup>
ASTM E 283	Air Exfiltration	Negative 6.24 Psf	0.035 Cfm/ft <sup>2</sup>	0.06 Cfm/ft <sup>2</sup>
ASTM E 331	Water Resistance	Positive 8.0 Psf	No Leakage	No Leakage
AAMA 501.1-17	Dynamic Water	56 Mph (8.0 Psf)	No Leakage	No Leakage
ASTM E 330*	Uniform Load Deflections	Positive 20.0 Psf	No Damage	No Damage
ASTM E 330*	Uniform Load Deflections	Negative 20.0 Psf	No Damage	No Damage
ASTM E 283	Repeat Air Infiltration	Positive 6.24 Psf	No Change	0.06 Cfm/ft <sup>2</sup>
ASTM E 331	Repeat Water Resistance	Positive 8.0 Psf	No Leakage	No Leakage
ASTM E 330*	Uniform Proof Load	Positive 30.0Psf	No Damage	No Damage
ASTM E 330*	Uniform Proof Load	Positive 30.0Psf	No Damage	No Damage

\*See indicator and Permanent set results, Appendix B

## 8. DISCLAIMER

This report was prepared by Construction Consulting Laboratory (CCL) for the exclusive use of the named client and does not constitute certification of this product. The results noted are actual tested values and apply only to the tested specimen using the components, construction, and installation methods described herein. Detailed drawings compared to the tested specimen are appended to this report. This report is the joint property of CCL and the named client to whom it is issued. Permission to reproduce this report by anyone other than the client and CCL must be approved in writing by both parties. This report must be reproduced in its entirety.

### CONSTRUCTION CONSULTING LABORATORY

  
 \_\_\_\_\_  
 WESLEY WILSON  
 LABORATORY MANAGER  
 SIGNED ELECTRONICALLY

  
 \_\_\_\_\_  
 EDSSON ALARCON  
 QUALITY ASSURANCE  
 SIGNED ELECTRONICALLY



**APPENDIX A**

**SKY BUILDING MATERIALS**

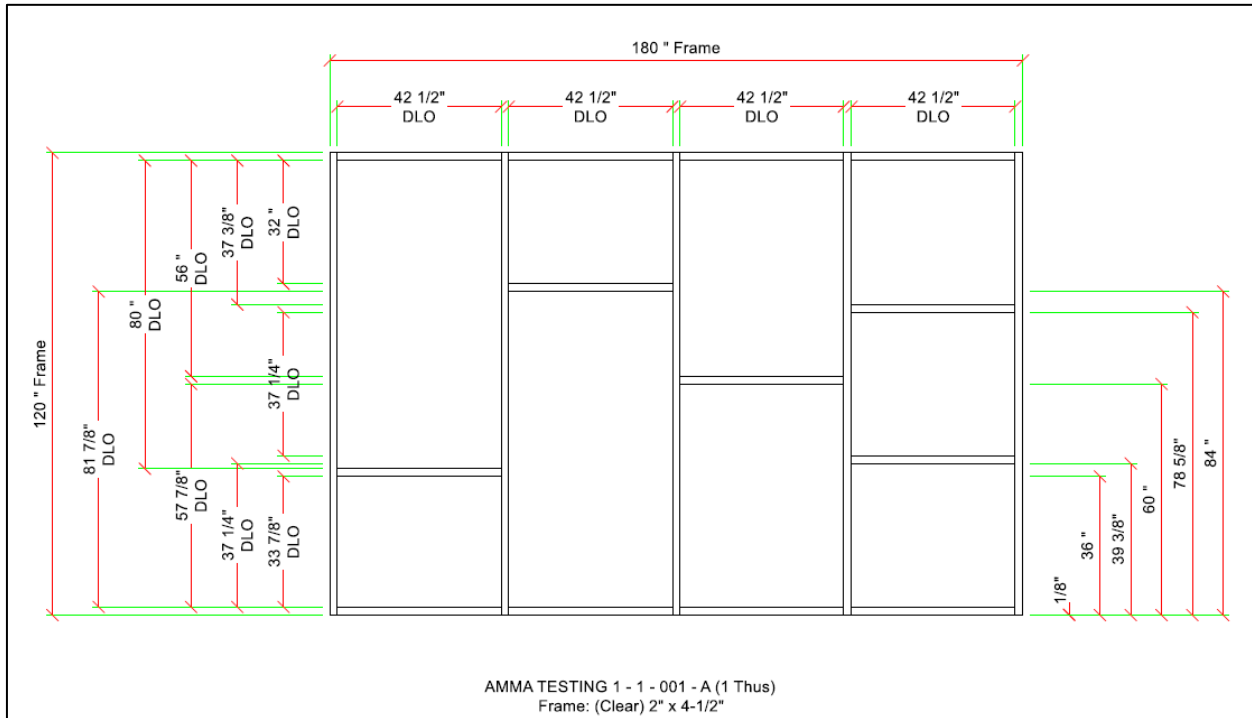
**1000 Storefront Drawings**

Referring to drawings in **Appendix A**, this report is not complete unless these drawings are stamped and initialed by **CCL** as illustrated below.

Sheet	Details	Date	Stamped as illustrated
1	Elevation / BOM / Install	9-13-23	Construction Consulting Laboratory 1601 Luna Road Carrollton, Texas 75006 (972) 242-0556
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6	Horizontal	Not dated	
7	Sill	Not dated	



2" x 4-1/2" CENTER GLAZE (1")
1000 SERIES



AMMA TESTING 1 - 1 - 001 - A (1 Thus)
Frame: (Clear) 2" x 4-1/2"

9/13/2023
11:18:31 AM

Job Parts Report
(By Package)

Job Name: SKY TEST 1000 Series
Vendor: Sky Building Materials
Finish: Clear

Packages
To Order

Table with 4 columns: Part #, Description | Finish, Part Type. Lists various window components like Flush Glaze-Roll, Flat Filler, Screws, SILL FLASHING, etc.

1000 Series (2" x 4-1/2")

- Fully caulk the bottom of flashing to ground (Sikaflex - 1A).
Caulk the inner back of flashing for the Sill to sit on.
Framing screw into each jam and sill joint.
Anchor screw will be every 6" around opening through flashing
Anchoring will also be secured through Sill every 12".
Every horizontal to vertical metal joint, is to be caulking.
Every vertical Jamb(mullion) member to be capped off with aluminum mullion cap-caulking to go in between jamb and jamb cap to secure seal.
10 water diverters to be used in elevation. One for every horizontal piece on each end.
2 end dams to be used. One on each end at the bottom.
Shims to be placed every 10" along sides and top.
Flat filler to be install on both sides, and top of entire elevation.
Caulking to go in the bed of the gasket pocket when securing glass.
All screws to be sealed will caulking
Setting Blocks to be used for Glass pocket.

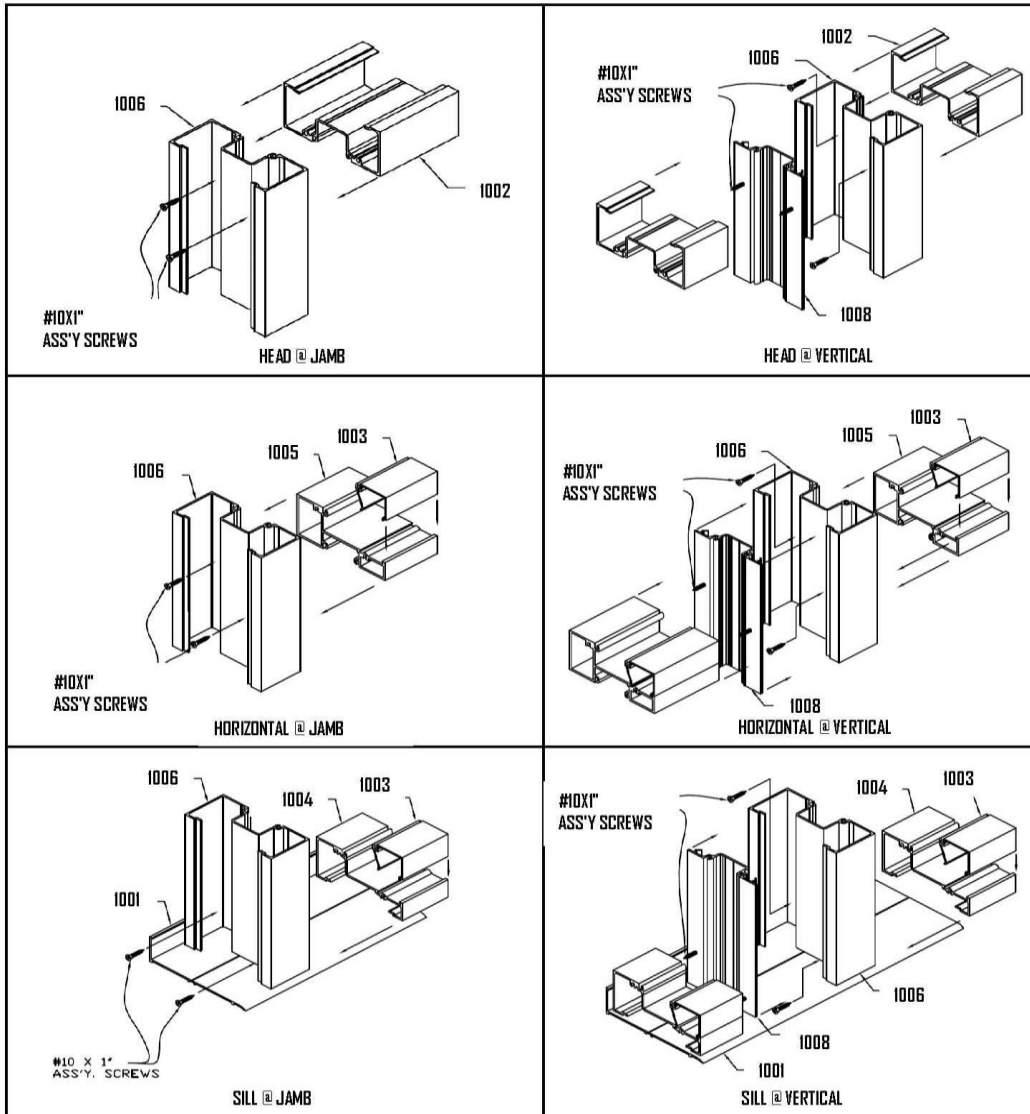
All 1" Glass is 1/4" Clear Tempered- 1/4" Clear Tempered (1" OA insulated)

Vendor: Cardinal IG



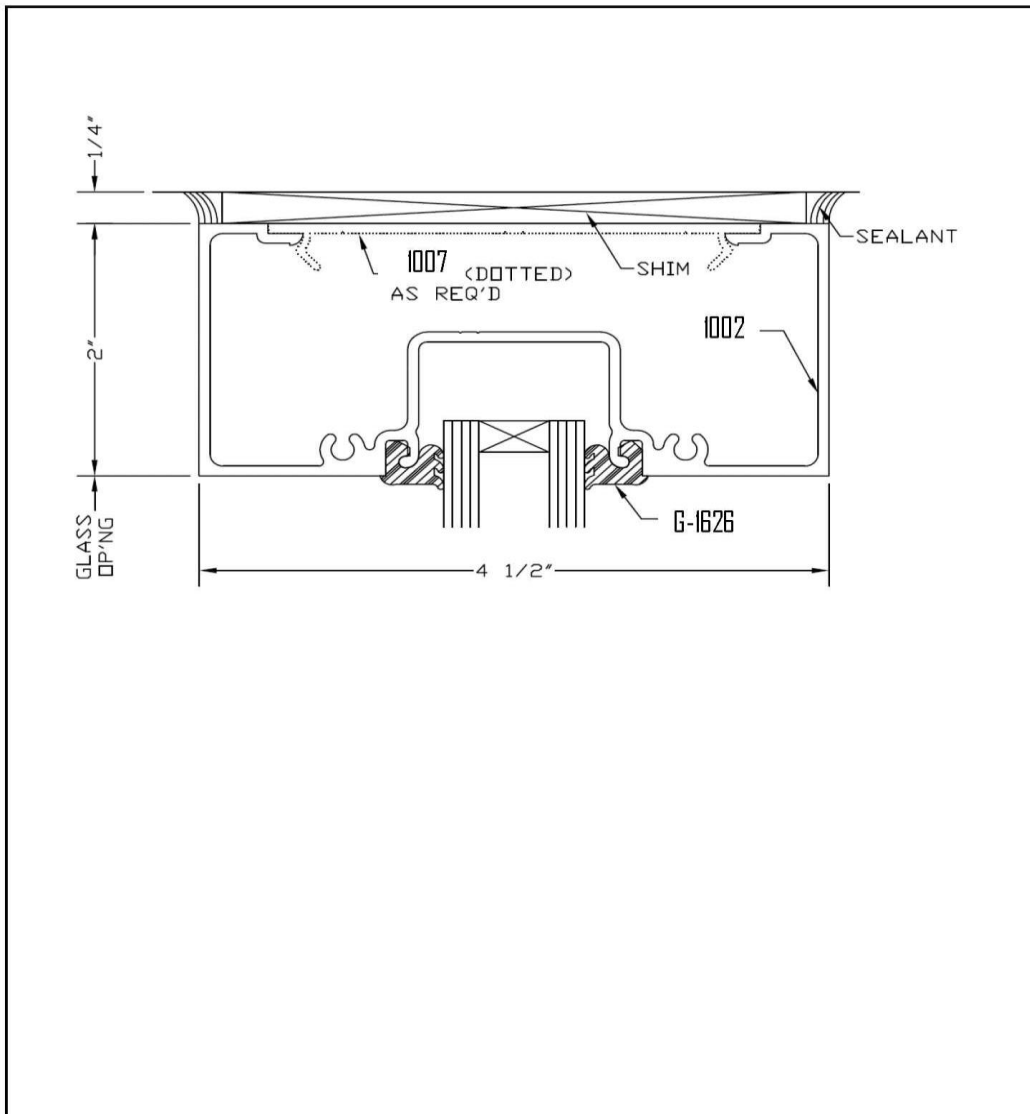


### 2" x 4-1/2" CENTER GLAZE (1") ASSEMBLY



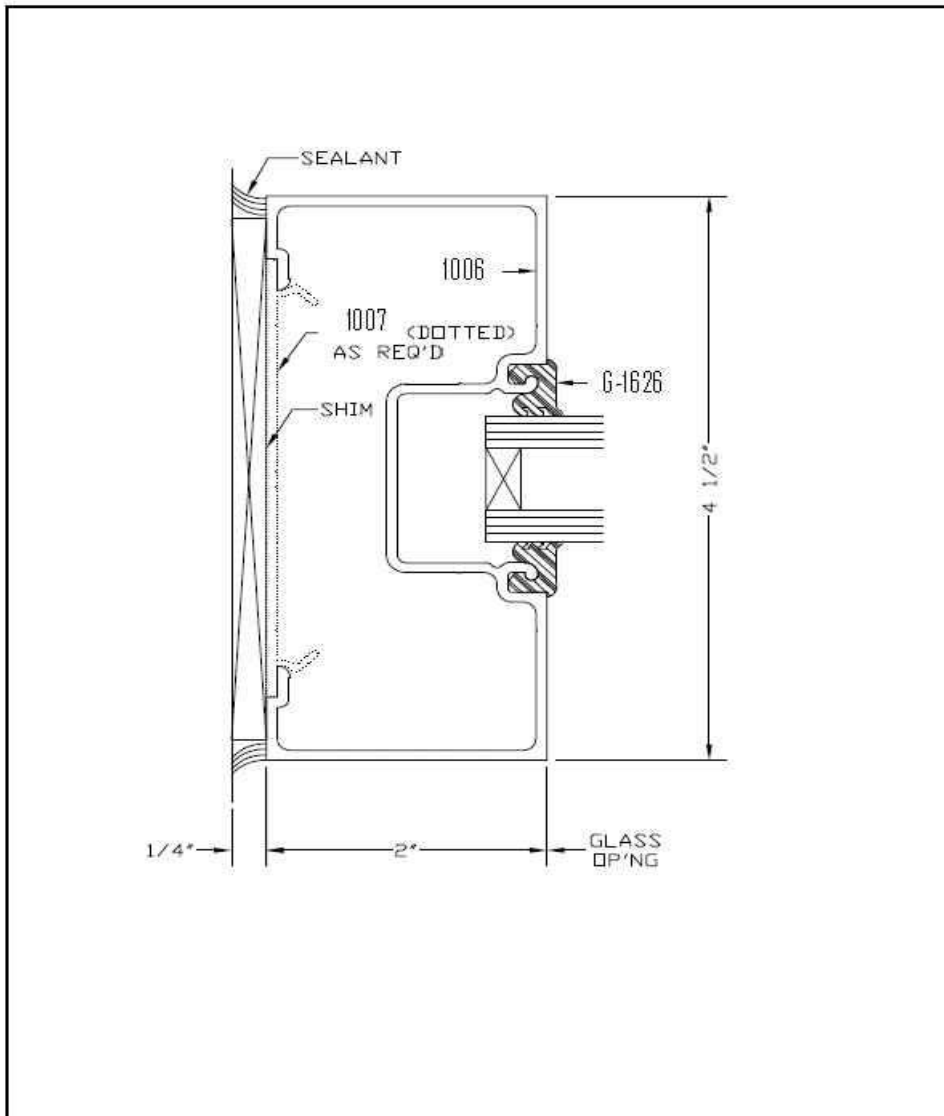


**2" x 4-1/2" CENTER GLAZE (1")  
DETAIL 1**



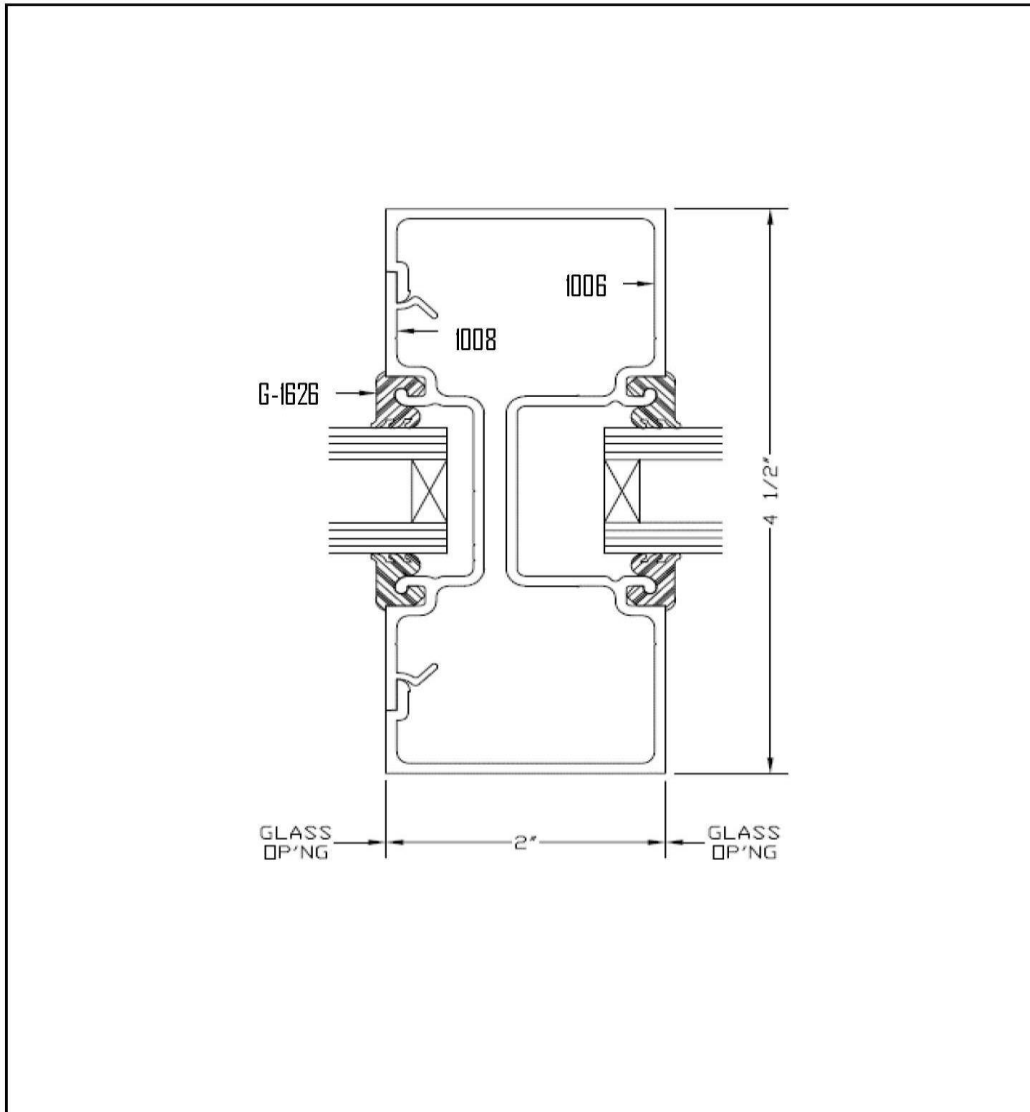


**2" x 4-1/2" CENTER GLAZE (1")  
DETAIL 2**



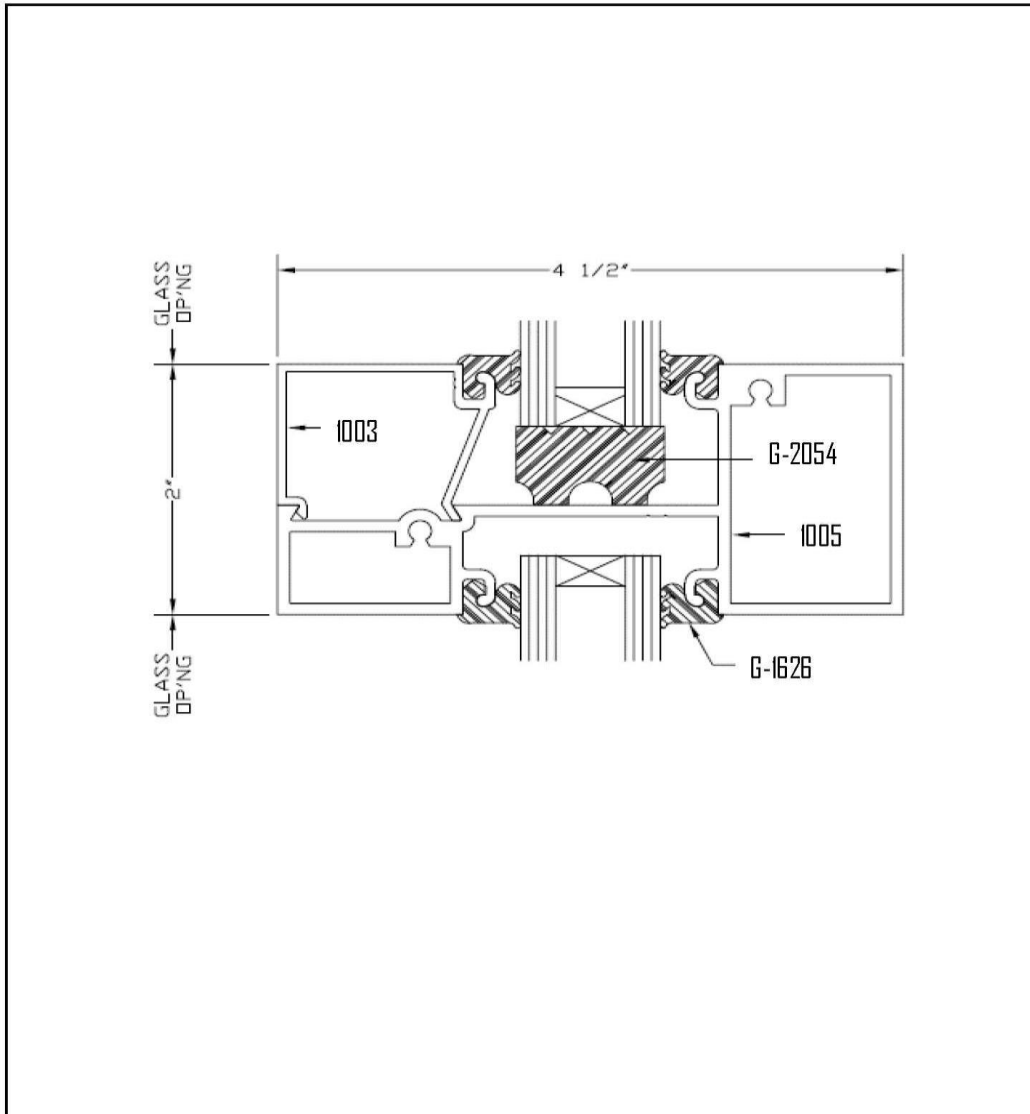


**2" x 4-1/2" CENTER GLAZE (1")  
DETAIL 3**



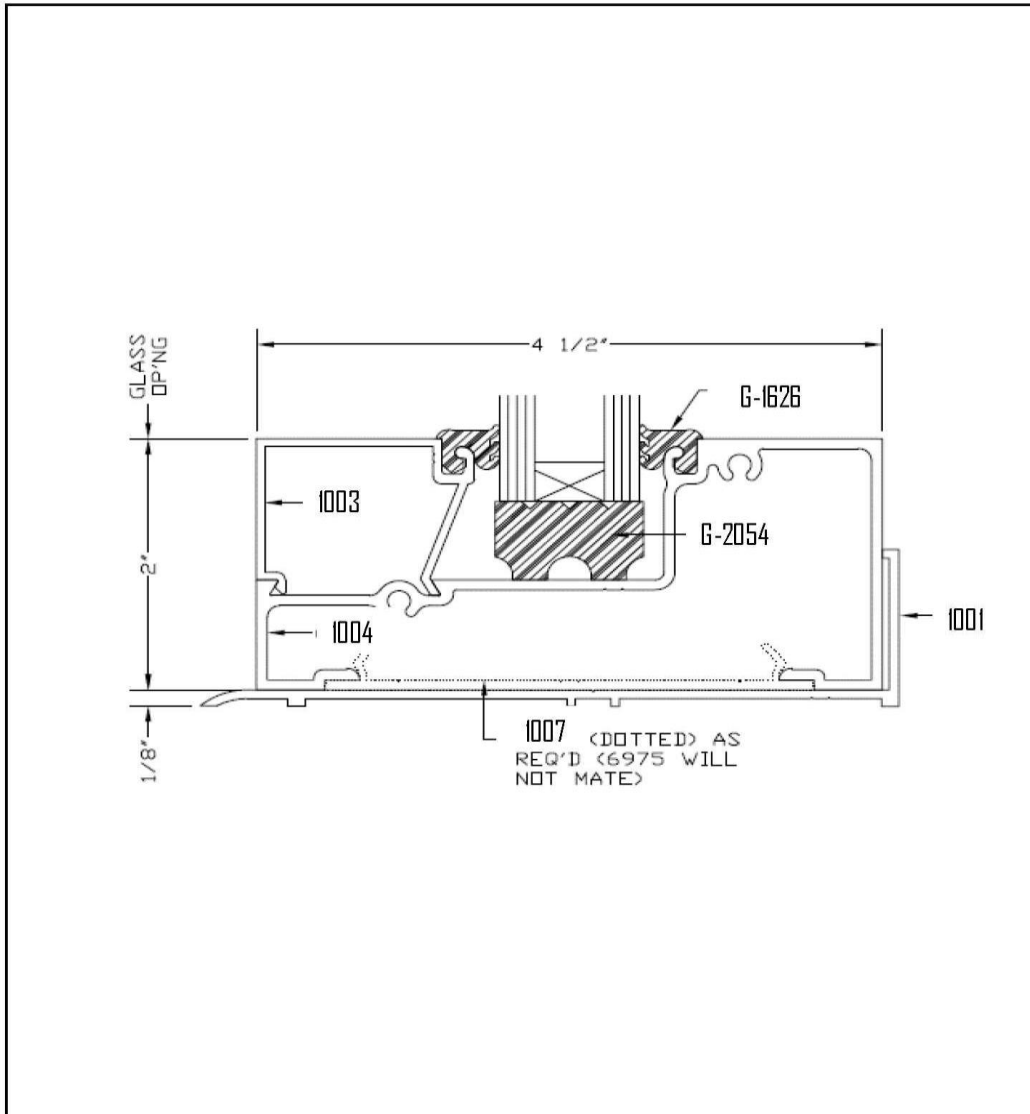


**2" x 4-1/2" CENTER GLAZE (1")**  
**DETAIL 4**





**2" x 4-1/2" CENTER GLAZE (1")  
DETAIL 5**





**CONSTRUCTION CONSULTING LABORATORY**

AAMA 501-15 PERFORMANCE TESTING

CLIENT: SKY BUILDING MATERIALS

REPORT: CCL 23-122

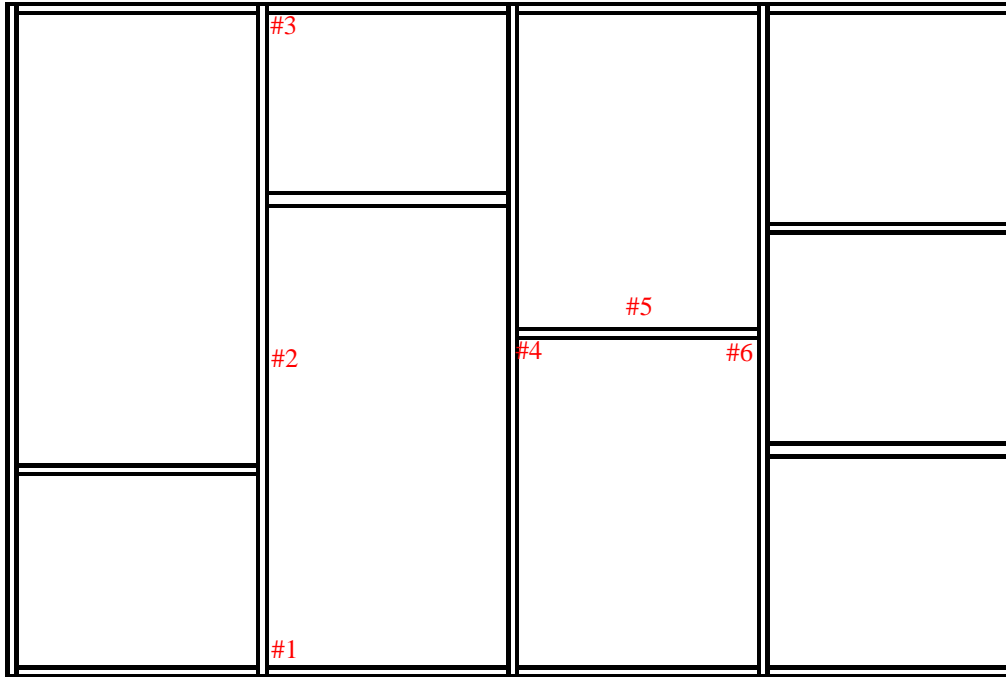
DATE: DECEMBER 8, 2023

PROJECT: 1000

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## APPENDIX B

# UNIFORM LOAD DEFLECTION RESULTS



TEST SPECIMEN DESIGN CRITERIA <small>Note 1</small>													
100% Design Pressure - Positive / Negative 20.0 Psf DP (10-Second Duration All Loads)													
Vertical Span: 128"/175 = 0.731"							Horizontal Span: 42.812" / 175 = 0.245"						
150% Design Pressure - Positive / Negative 30.0 Psf DP (10-Second Duration All Loads)													
Vertical Span: 128"/500 = 0.256"							Horizontal Span: 42.812" / 500 = 0.086"						
50% & 100% DESIGN STRUCTURAL DEFLECTION TABLE, See Appendix B for indicator locations													
Ind.	+20.0 Psf			+30.0 Psf			-20.0 Psf			-30.0 Psf			Allowed
	Total	Set	Net	Total	Set	S-Net	Total	Set	Net	Total	Set	S-Net	Net / S-Net
1	.02	.00		.03	.00		.01	.01		.02	.01		
2	.39	.00	.37	.52	.03	.02	.45	.05	.42	.59	.04	.03	.731 / .256
3	.02	.01		.04	.01		.03	.01		.04	.02		
4	.00	.00		.00	.00		.00	0.0		.00	.01		
5	.00	.00	.00	.01	.00	.00	.00	0.0	.00	.01	.01	.01	.245 / .086
6	.00	.00		.00	.00		.00	0.0		.01	.00		

Note 1: Plastic was not used to achieve the noted test load.





**CONSTRUCTION CONSULTING LABORATORY**

AAMA 501-15 PERFORMANCE TESTING

CLIENT: SKY BUILDING MATERIALS

REPORT: CCL 23-122

DATE: DECEMBER 8, 2023

PROJECT: 1000

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## APPENDIX B

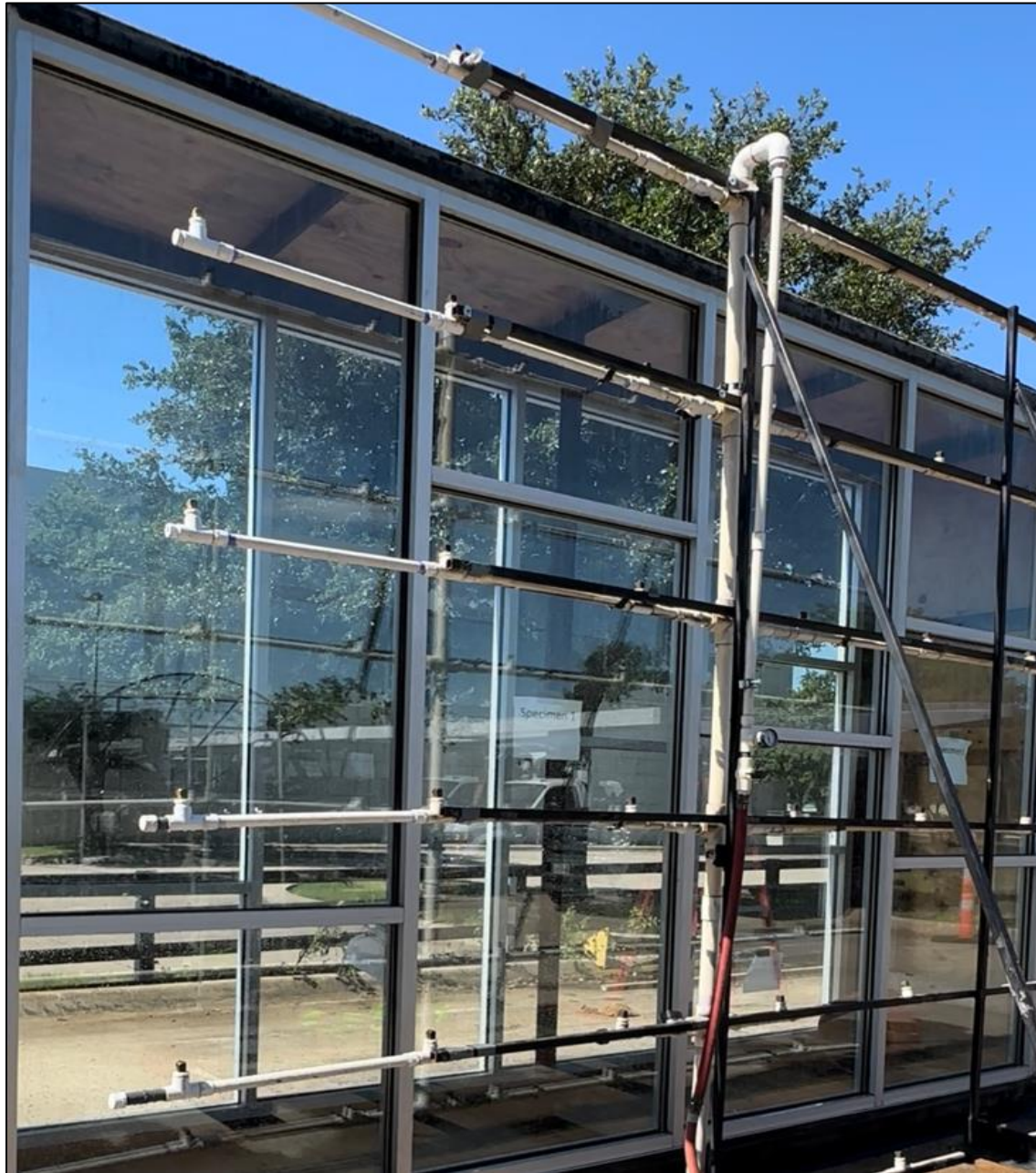
# PHOTOGRAPHS



**PHOTO 1**

**Air Infiltration per ASTM E 283:** The total amount of air infiltration shall not exceed .06 Cfm/ Ft<sup>2</sup> of the specimen size. Mock-up size 15'-1" wide by 10'-8" high = 152.09 Ft<sup>2</sup> x 0.06 CFM = 9.125 CFM - Allowed

**Infiltration Procedure:** The specimen shall be covered with 2-mil plastic sheet material and sealed with spray adhesive and duct tape to the chamber perimeter, thus allowing no movement of air through the specimen. The specimen shall be subjected to a positive pressure differential of 6.24 Psf to obtain a leakage rate for the test chamber. The plastic bag shall be removed, and the chamber pressurized to a positive 6.24 Psf to measure total air infiltration. The chamber infiltration shall be subtracted from the total air infiltration resulting in the infiltration rate of the test specimen.



**PHOTO 2**

**Static Water Penetration per ASTM E 331:** Per project specifications, there shall be no water penetration while subjected to a static test pressure of 8.0 Psf.

**Procedure:** Water shall be applied to the specimen at a minimum rate of 5 Gph/Ft<sup>2</sup>, in such a way as to completely cover the exterior face of the specimen. Simultaneously, a specified positive static pressure shall be applied for a minimum period of fifteen (15) minutes.



**PHOTO 3**

**Dynamic Water Penetration per AAMA 501.1-17:** Per project specifications, there shall be no water penetration while subjected to wind speed of 56 Mph (equivalent to 8.0 Psf).

**Procedure:** Water shall be applied to the specimen at a minimum rate of 5 Gph/Ft<sup>2</sup>, in such a way as to completely cover the exterior face of the specimen. While simultaneously, a wind-speed equivalent to the project specified static test pressure is applied. The application of wind and water shall be applied for a minimum period of fifteen (15) minutes, **Photo 3.**

**- END OF REPORT -**