

CLADDING FAÇADE SOLUTIONS TEST REPORT

SCOPE OF WORK

ASTM E283, E331, AND E330/E330M TESTING ON CFS DJ (DRY JOINT) 4 MM, ACM PANELS

REPORT NUMBER

M6725.01-109-44

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09/27/21 - 10/06/21

ISSUE DATE

12/01/21

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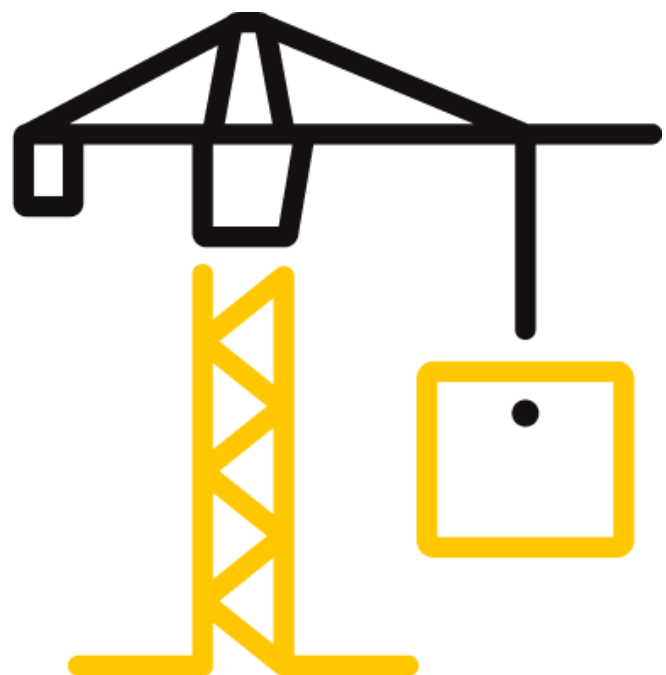
18

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TEST REPORT FOR CLADDING FAÇADE SOLUTIONS

Report No.: M6725.01-109-44

Date: 12/01/21

REPORT ISSUED TO

CLADDING FAÇADE SOLUTIONS

5109 Commonwealth Drive
Fredericksburg, Virginia 22407

SECTION 1

SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Cladding Façade Solutions to perform testing in accordance with ASTM E283, E331, and E330/E330M on their CFS DJ (Dry Joint) 4 mm, ACM panels. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek B&C test facility in York, Pennsylvania.

SECTION 2

SUMMARY OF TEST RESULTS

TITLE	TEST SPECIMEN #1 RESULTS
Negative Design Pressure	-3200 Pa (-66.83 psf)
Air Infiltration at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)
Air Infiltration at 300 Pa (6.27 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)
Air Exfiltration at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)
Air Exfiltration at 300 Pa (6.27 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	720 Pa (15.04 psf)

TITLE	TEST SPECIMEN #2 RESULTS
Positive Design Pressure	+4320 Pa (+90.23 psf)

For INTERTEK B&C:

COMPLETED BY:	Andrew P. Mehalick	REVIEWED BY:	Vicki L. McElwain
TITLE:	Technician – Product Testing	TITLE:	Manager – Product Testing
SIGNATURE:		SIGNATURE:	
DATE:	12/01/21	DATE:	12/01/21

APM:nls

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SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

ASTM E283-04(2012), *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*

ASTM E331-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E330/E330M-14, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimens were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of four years from the test completion date.

SECTION 5

EQUIPMENT

Tape Measure Verification: 63788

Weather Station: 63316

Control Panel: 003921

Water Spray Racks: 003956-B and C

Linear Transducers: 62182, 62189, 003420, Y003056, 64368, 62187, 64461, 003439

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Michael Dasaro	Cladding Façade Solutions
Vicki L. McElwain	Intertek B&C
Andrew P. Mehalick	Intertek B&C

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SECTION 7

TEST SPECIMEN DESCRIPTION

Product Type: ACM Panels

Series/Model: CFS DJ (Dry Joint) 4 mm

Product Size(s):

Test Specimens #1 and #2:

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
5.9 m ² (64.0 ft ²)				
Overall size	2438	96	2438	96
Panel size	572	22-1/2	1186	46-11/16

The following descriptions apply to all specimens.

Test Wall Construction: The test wall was constructed from 18-gauge steel studs and tracks. The studs were secured to the track using #6 x 1/2" Tek screws upon the interior and exterior of the tracks. The wall was sheathed with 5/8" exterior gypsum board. The gypsum board was secured using #8 x 1-5/8" self-tapping flat head screws spaced 8" on center. The test wall had an air water vapor barrier placed upon it and stapled into place using 3/8" crown X 1/2" long staples every 12" on center. The vapor barrier allowed for a 3" overlap at each seam and the seams were taped. Clips were placed 1" below the top and 1" above the bottom of the test wall, at each stud and spaced 16" on center. The "L" clips were made from 0.170" thick aluminum and measured 3-3/4" wide, 4-3/4" high, 2" deep. Two #12 x 2-1/2" hex head self-tapping screws were utilized to secure the clips to the test wall. A 1/4" PVC spacer was placed under the clip prior to it being secured to the wall. A 0.075" thick aluminum "T" rail was secured to the clips and was run vertically. The "T" rail measured 3-1/2" wide by 2-1/4" tall and was secured using two #10 x 7/8" hex head self-tapping screws through the clip and into the rail. An 1/8" thick by 2" wide by 48" long flat aluminum rail was placed every 16" vertically and were run horizontally. One #10 x 1" hex head self-tapping screw was utilized to secure the rail to the "T" rails. The panels were installed onto the test wall and secured through the panel system extrusion and attachment clips. The panels were secured using the CFS Double Attachment Clips, which measure 3-1/2" in length and were attached to the "T" rail using #10 x 1" self-tapping hex screws. The clips were installed at each vertical joint and placed 4" on center from each panel corner, spaced at 13" intervals. The CFS Single Attachment Clip was used at the left and right sides of the test wall. No attachment clips were used at the panel horizontal joints. For negative loads, 2 mil plastic was placed on top of the rail system. For positive loads, the 2 mil plastic was placed on top of the panels to facilitate testing.

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Panel Construction: The panels were constructed from 0.018" thick aluminum interior exterior skin and 0.110" thick composite core material. The panels were routed and a 1" return leg was utilized on each side. The 0.058" aluminum CFS Dry Joint Extrusion installation rails were installed onto the panel 1" from each corner. A 3" by 3" aluminum corner key was utilized at each corner. The installation rail and corner key were secured to the panels using a 1/4" diameter pop rivet 2" from each corner. The installation rails utilized 1/4" pop rivets space every 24" on center vertically and one at midspan horizontally.

**SECTION 8
TEST RESULTS**

The temperature range during testing was 21°C - 25°C (70°F - 77°F). The results are tabulated as follows:

Test Specimen #1:

TITLE OF TEST	RESULTS	NOTE
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	2
Air Leakage, Infiltration per ASTM E283 at 300 Pa (6.27 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	2
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	2
Air Leakage, Exfiltration per ASTM E283 at 300 Pa (6.27 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	2
Water Penetration, per ASTM E331 at 720 Pa (15.04 psf)	Pass	

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Test Specimen #1: (Continued)

TITLE OF TEST	RESULTS	NOTE
Uniform Load Deflection, per ASTM E330 Deflections taken at center of wall -3600 Pa (-75.19 psf)	11.7 mm (0.46")	1, 3, 4
Uniform Load Deflection, per ASTM E330 Deflections taken between stiffeners -3600 Pa (-75.19 psf)	4.1 mm (0.16")	1, 3, 4
Uniform Load Deflection, per ASTM E330 Deflections taken between fasteners -3600 Pa (-75.19 psf)	0.5 mm (0.02")	1, 3, 4
Uniform Load Structural, per ASTM E330 Permanent set taken at center of wall -4800 Pa (-100.25 psf)	1.5 mm (0.06")	3, 4
Uniform Load Structural, per ASTM E330 Permanent set taken between stiffeners -4800 Pa (-100.25 psf)	0.3 mm (0.01")	3, 4
Uniform Load Structural, per ASTM E330 Permanent set taken between fasteners -4800 Pa (-100.25 psf)	0.3 mm (0.01")	3, 4

Note 1: The -75.19 psf (Design Pressure) was used as the closest to and greater than pressure for the representative deflections for the -66.83 psf (Design Pressure). The -66.83 psf (Design Pressure) was not run due to the test loading sequence.

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Test Specimen #2:

TITLE OF TEST	RESULTS	NOTE
Uniform Load Deflection, per ASTM E330 Deflections taken at center of wall +4320 Pa (+90.23 psf)	5.1 mm (0.20")	3, 4
Uniform Load Deflection, per ASTM E330 Deflections taken between stiffeners +4320 Pa (+90.23 psf)	2.0 mm (0.08")	3, 4
Uniform Load Deflection, per ASTM E330 Deflections taken between fasteners +4320 Pa (+90.23 psf)	0.3 mm (0.01")	3, 4
Uniform Load Structural, per ASTM E330 Permanent set taken at center of wall +6480 Pa (+135.34 psf)	0.3 mm (0.01")	3, 4
Uniform Load Structural, per ASTM E330 Permanent set taken between stiffeners +6480 Pa (+135.34 psf)	0.3 mm (0.01")	3, 4
Uniform Load Structural, per ASTM E330 Permanent set taken between fasteners +6480 Pa (+135.34 psf)	0.3 mm (0.01")	3, 4

General Note: All testing was performed in accordance with the referenced standard(s).

Note 2: Test Date 09/28/21 / Time: 8:00 AM

Note 3: Loads were held for 10 seconds.

Note 4: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

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SECTION 9

CONCLUSION

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

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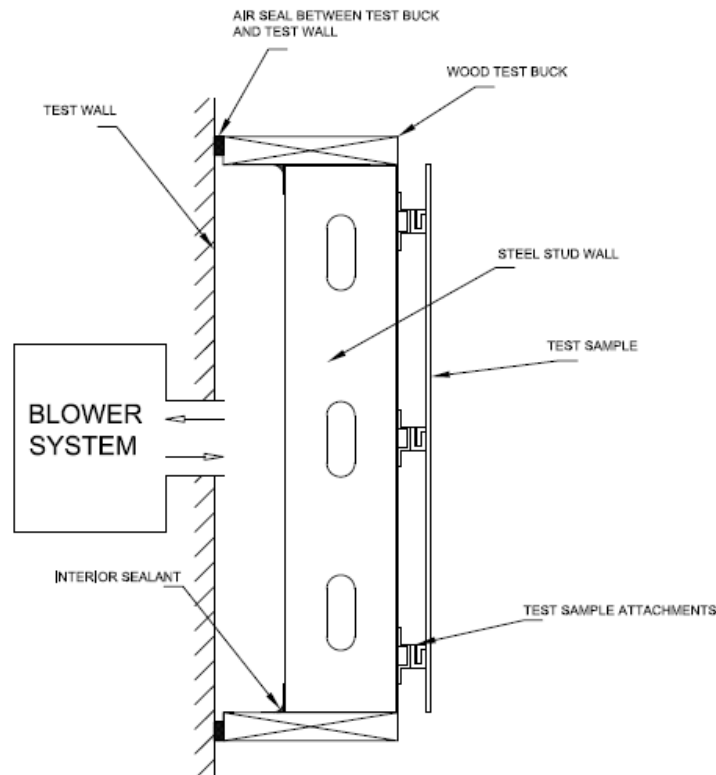
Date: 12/01/21

SECTION 10

LOCATION OF AIR SEAL

The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.

PANEL SYSTEM STEEL STUD



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SECTION 11

PHOTOGRAPH



Photo No. 1
Test Specimen Prior to Testing



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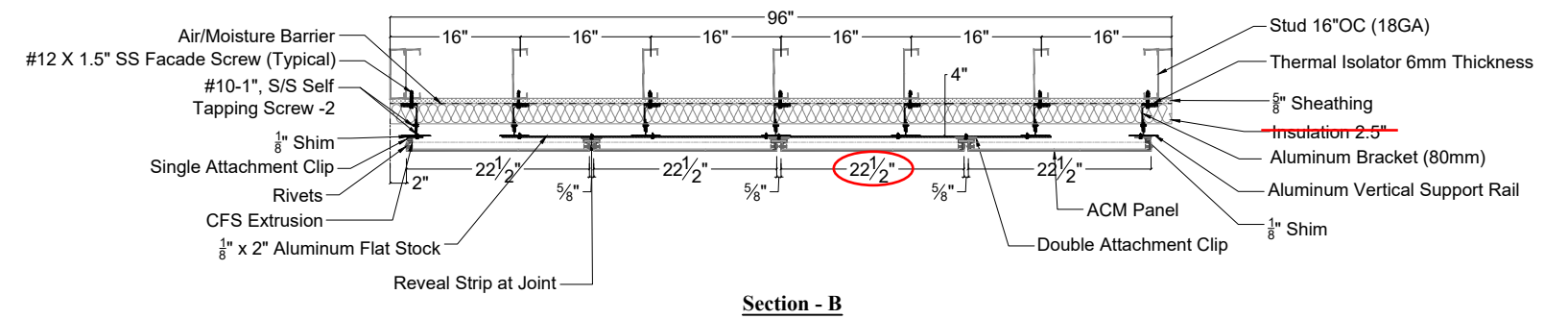
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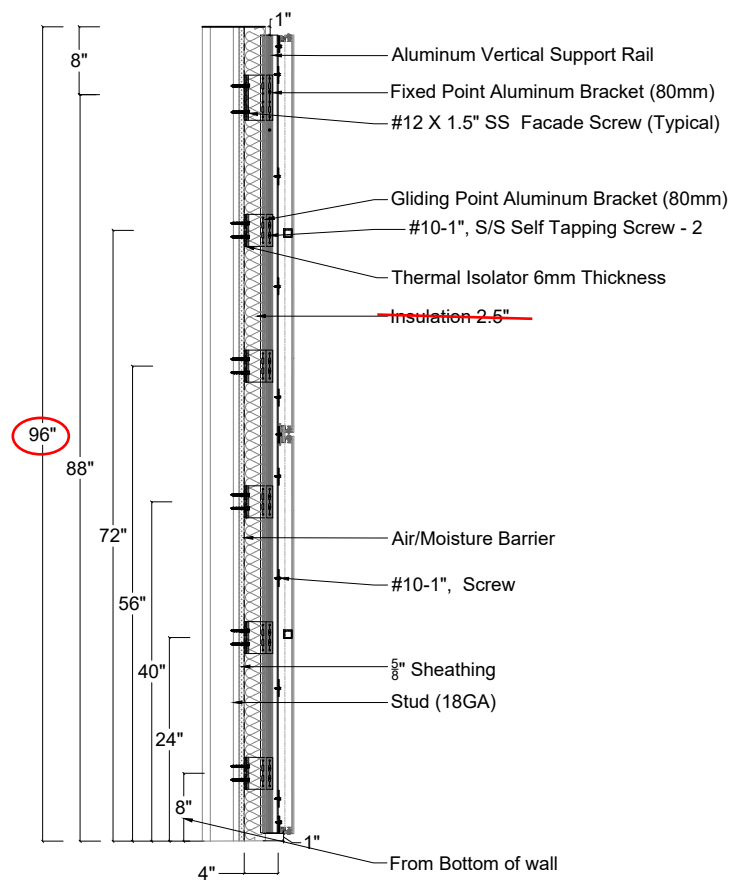
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SECTION 12 DRAWINGS

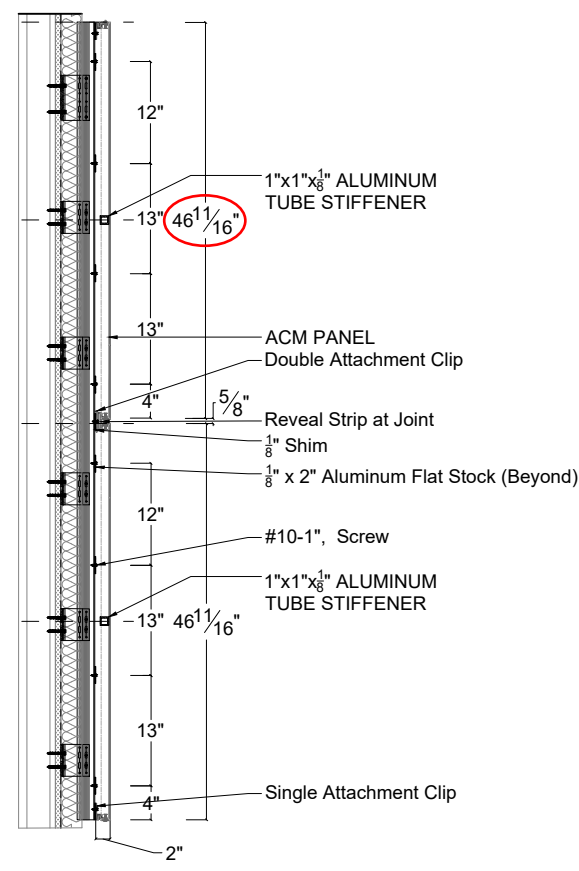
The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



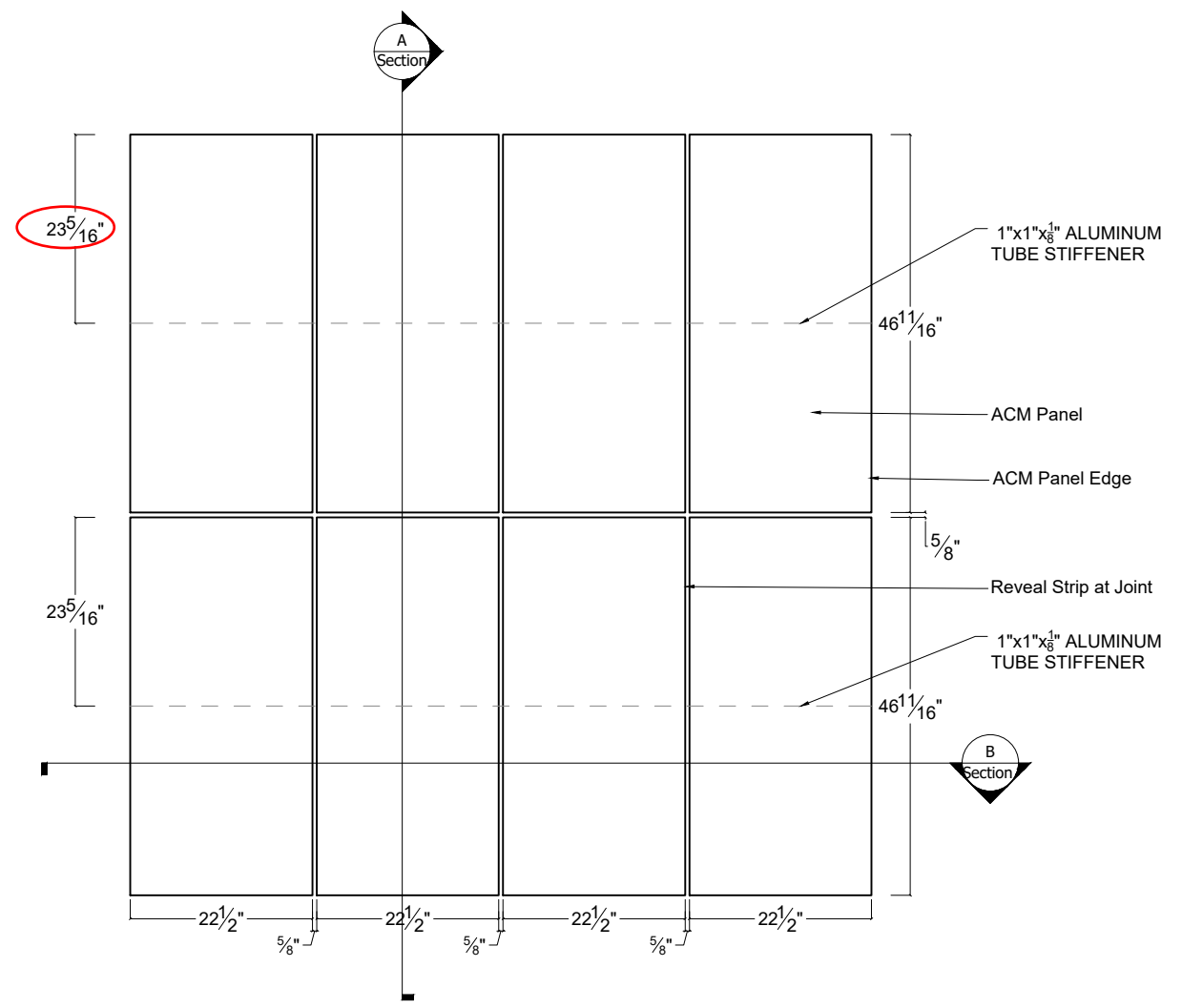
Section - B




Section - A (framing detail)




Section - A.1 (panel detail)


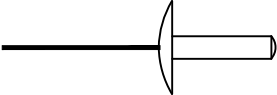



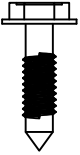
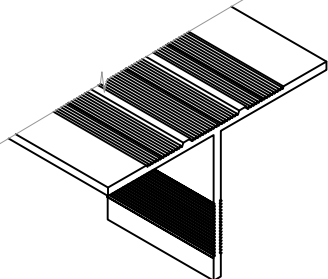


Panel Layout

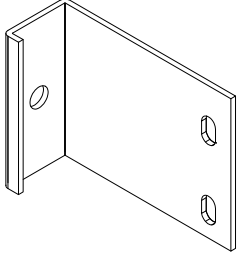
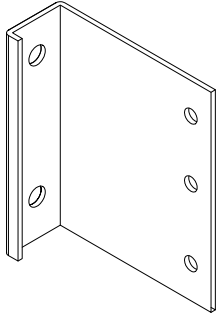
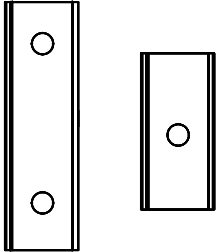

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	Verified by:	<i>Andrew P. Mahabadi</i>

Mock Up Drawing (ACM Panel, Dry Joint System)	
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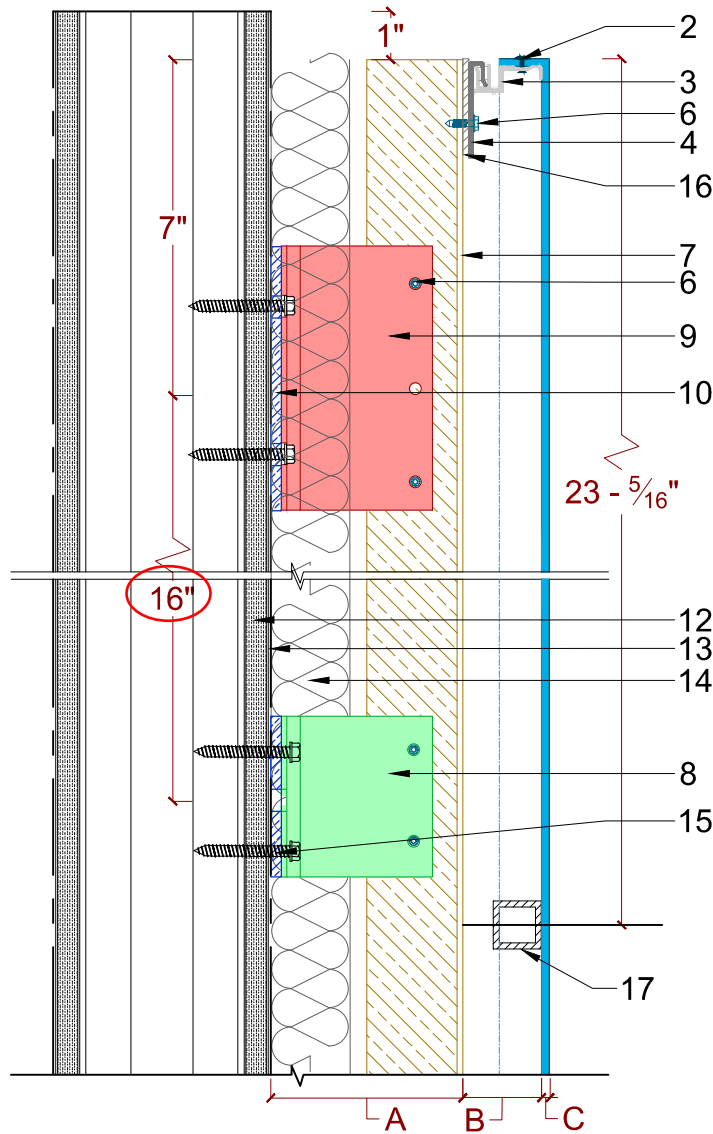
CFS ALUMINUM COMPOSITE PANEL Dry Joint System Testing Component List

No	Materials	
01	Aluminum Composite Panel	
02	Rivets	
03	CFS Extrusion	
04	Starter Clip / Single Attachment Clip	
05	Double Attachment Clip	
06	#10-1", S/S Self Tapping Screw	
07	Aluminum Vertical Support Rail	

CFS ALUMINUM COMPOSITE PANEL - CF

No	Materials (supplied by CFS)	
08	Gliding Point Aluminum Bracket	
09	Fixed Point Aluminum Bracket	
10	Thermal Isolator	
11	Reveal Strip	

CFS ALUMINUM COMPOSITE PANEL - CF



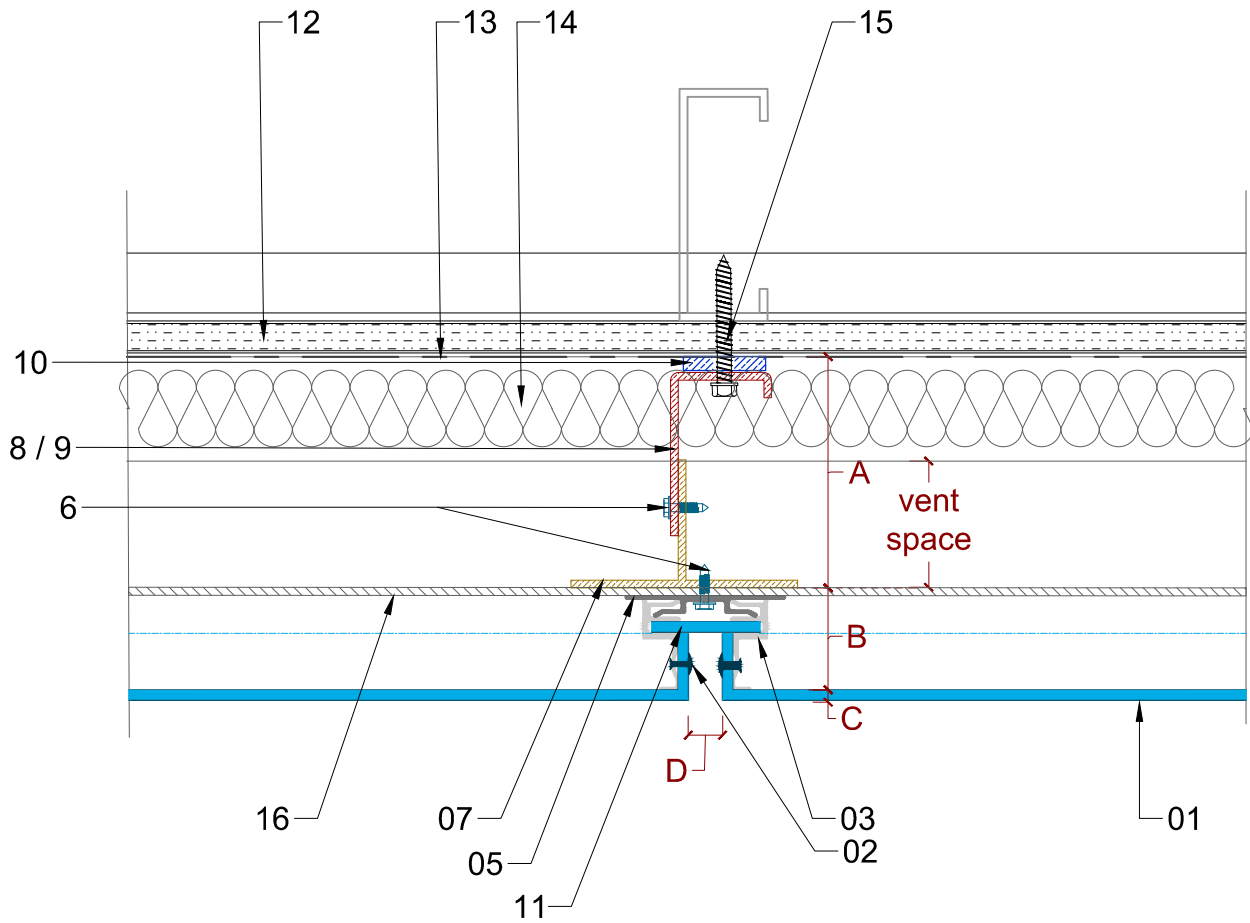
1 Top of Wall Detail
Scale: NTS

No	Materials
01	Aluminum Composite Panel
02	Rivets
03	CFS Extrusion
04	Starter Clip
05	Double Attachment Clip
06	#10-1", S/S Self Tapping Screw
07	Aluminum vertical support rail
08	Gliding Point Aluminum Bracket
09	Fixed Point Aluminum Bracket
10	Thermal Isolator
11	Reveal Strip
12	Sheathing (5/8" - Gypsum board)
13	Air / Moisture Barrier
14	Insulation (Mineral wool) Thickness varies
15	Facade Screw #12 x1.5" SS
16	Aluminum Flat Stock, 2 x 1/8"
17	1"X1"X1/8" Aluminum Tube Stiffener

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	Verified by:	<i>Adrian P. Mehalak</i>

DIMENSION LEGEND		
Code	Measurements	Remarks
A	4" (100mm)	
B	2" (50mm)	
C	3/16" (4mm)	
D	5/8" (16mm)	

CFS ALUMINUM COMPOSITE PANEL - CF



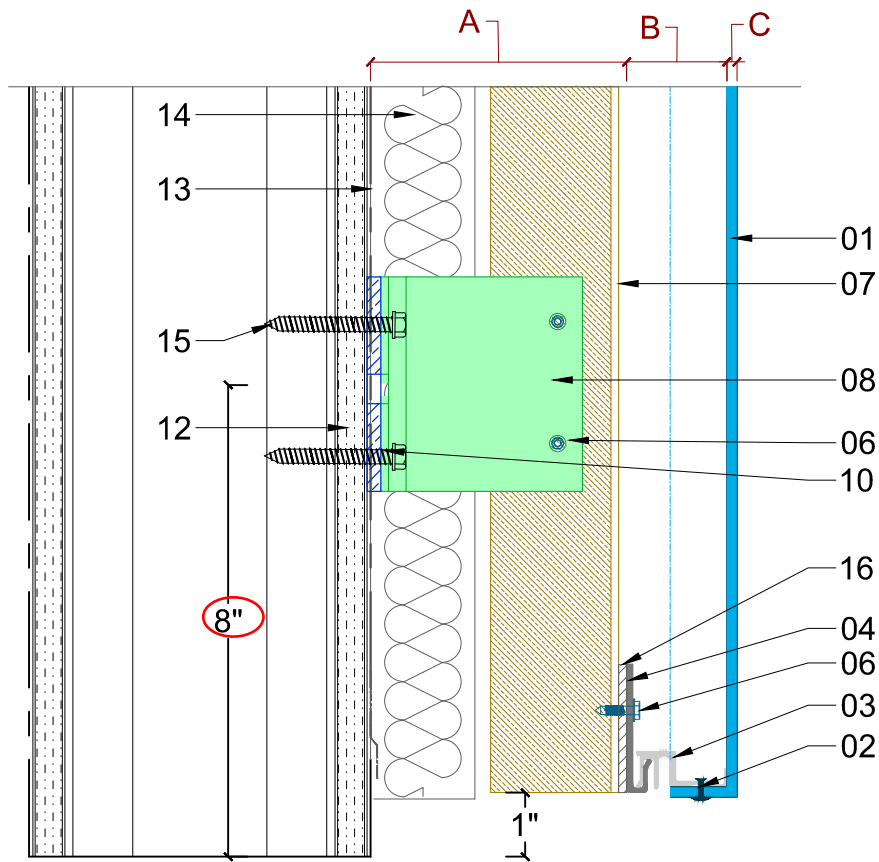
2 Vertical Panel Joint Detail
Scale: NTS

No	Materials
01	Aluminum Composite Panel
02	Rivets
03	CFS Extrusion
04	Starter Clip
05	Double Attachment Clip
06	#10-1", S/S Self Tapping Screw
07	Aluminum vertical support rail
08	Gliding Point Aluminum Bracket
09	Fixed Point Aluminum Bracket
10	Thermal Isolator
11	Reveal Strip
12	Sheathing (5/8" - Gypsum board)
13	Air / Moisture Barrier
14	Insulation (Mineral wool) Thickness varies
15	Facade Screw #12 x1.5" SS
16	Aluminum Flat Stock, 2 x 1/8"
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DIMENSION LEGEND		
Code	Measurements	Remarks
A	4" (100mm)	
B	2" (50mm)	
C	3/16" (4mm)	
D	5/8" (16mm)	

CFS ALUMINUM COMPOSITE PANEL - CF



3 Termination at Ground Detail

Scale: NTS

No	Materials
01	Aluminum Composite Panel
02	Rivets
03	CFS Extrusion
04	Starter Clip
05	Double Attachment Clip
06	#10-1", S/S Self Tapping Screw
07	Aluminum vertical support rail
08	Gliding Point Aluminum Bracket
09	Fixed Point Aluminum Bracket
10	Thermal Isolator
11	Reveal Strip
12	Sheathing (5/8" - Gypsum board)
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SECTION 13

REVISION LOG

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0	12/01/21	N/A	Original Report Issue