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ACCURATE PANEL SYSTEMS LTD.

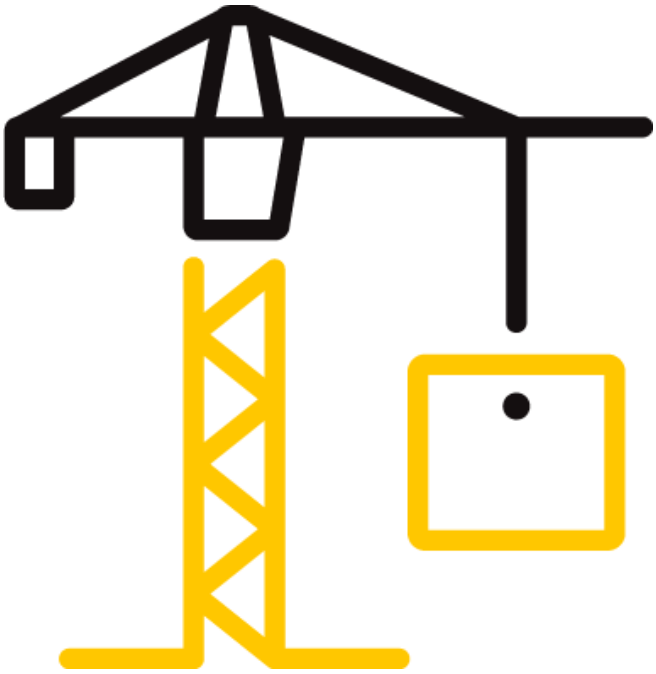
TEST REPORT

TEST REPORT ISSUED TO
Accurate Panel Systems Ltd.
725 Industrial Way
Victoria, BC V9B 6E2
Canada

SPECIFICATION(S) / STANDARD(S)
AAMA 508-14

PRODUCT SERIES & TYPE
APS Rain Screen Panel System

EVALUATION PROPERTIES
Pressure Equalization, Static Water Penetration Resistance, Dynamic Water Penetration Resistance and Uniform Load



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104469717COQ-002A

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12/17/20

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GFT-OP-10c (09/29/20)

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TEST REPORT FOR ACCURATE PANEL SYSTEMS LTD.
Report No.: 104469717COQ-002A
Date: 12/17/20

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Accurate Panel Systems Ltd. to perform testing on the APS Rain Screen Panel System in accordance with the following standard/specifications:

- AAMA 508-14, *Voluntary Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems* (AAMA 508)

Testing was conducted at the Intertek test facility in Coquitlam, BC.

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.

For INTERTEK B&C:

COMPLETED BY:	Jason Komorski	**REVIEWED BY:**	David Park
TITLE:	Technician – Building Products	**TITLE:**	Reviewer – Building Products
SIGNATURE:		**SIGNATURE:**	
DATE:	12/17/20	**DATE:**	12/17/20

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SECTION 2
SUMMARY OF TEST RESULTS

A summary of results are as indicated in the table below:

Evaluation Property	Results
Pressure Equalization	Pass
Static Water Penetration Resistance	Pass – 720 Pa (15.0 psf)
Dynamic Water Penetration Resistance	Pass ~ 120 kph (75 mph)
Uniform Load	Ultimate Load = 115 psf

Details of the tested results can be found in Section 7 of this report.

SECTION 3
TEST METHOD(S)

The specimen was tested and evaluated in accordance with the following:

- AAMA 508-14, *Voluntary Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems* (AAMA 508)

SECTION 4
EQUIPMENT

ASSET #	DESCRIPTION	CAL DUE DATE
60650	Fenestration Control Unit	04/09/21
60651	Water Spray Assembly	04/09/21
60652	Water Spray Assembly	04/09/21
ITS1	Water Spray Assembly	04/09/21
D7811	20” Linear Transducer	04/21/21
D7814	20” Linear Transducer	04/21/21
D7816	20” Linear Transducer	04/21/21
64924	20” Linear Transducer	12/29/20
64925	20” Linear Transducer	12/29/20
64926	20” Linear Transducer	04/21/21
63170	Micro Mule	05/20/21
INT00712	Rain Screen Pressure Box	10/22/21

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SECTION 5
TEST PROCEDURE

AIR LEAKAGE

The Air Leakage tests (Air Infiltration) were conducted in accordance with ASTM E283. The tests were performed using a test pressure of 75 Pa (1.57 psf). As per AAMA 508, air leakage was induced in the system to provide a leakage rate of 0.6 L/s*m^2.

PRESSURE EQUALIZATION

The Pressure Equalization test was tested in accordance with ASTM E1233 and evaluated to AAMA 508. The test was performed at a specified pressure differential of 240 Pa (5 psf) to 1200 Pa (25 psf) for a minimum of 100 cycles.

STATIC WATER PENETRATION RESISTANCE

The Static Water Penetration test was tested in accordance with ASTM E331 and evaluated to Section 6.1 of AAMA 508. This test was performed at the specified pressure differential of 720 Pa (15 psf) and a water spray rate of at least 204 L/m^2 per hour (5.0 U.S. gal/ft^2 per hour). The test was run for fifteen minutes, during which the pressure and water spray were continuously applied.

DYNAMIC WATER PENETRATION RESISTANCE

The Dynamic Water Penetration test was tested in accordance with AAMA 501.1 and evaluated to Section 6.1 of AAMA 508. The test was performed at the specified wind speed of 120 kph (75 mph) wind, generated using a Wind Generator, and a water spray rate of at least 204 L/m^2 per hour (5.0 U.S. gal/ft^2 per hour). This test consisted of fifteen minutes, during which the wind and water spray were continuously applied.

UNIFORM LOAD STRUCTURAL

The Structural Performance testing was conducted in accordance with ASTM E330/E330M-14 *"Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference"* (ASTM E330), Procedure A. The test was performed in the negative wind load direction only. After the 10 second preload (50% of the first test load), followed by 1 minute with the pressure released, the full test load was applied for 10 seconds and then released. The test loads had started at 240 Pa (5 psf) and continued upwards in 240 Pa (5 psf) increments until failure.

DEVIATION FROM STANDARD METHOD

There were no noted deviations from the test standards used in the evaluation reported herein.

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SECTION 6
TEST SPECIMEN DESCRIPTION

Product Type: APS Rain Screen Wall Panel System
Overall Size: 96” wide by 96” high
Configuration: 4x 47-5/8” x 47-5/8” panels with vertical and horizontal seams

Rain Screen Construction: The test specimen consisted of 4x 47-5/8” x 47-5/8” Aluminum Composite Panels (ACM). Each panel had an aluminum framing extrusion installed around the perimeter. The installation clips would slide into this extrusion and were secured into the wall assembly using 2x #10 x 1-1/2” pan-head aluminum screws and clipped into the edge tracks of the panels located at:

- Upper horizontal clips located at stud locations.
- 3x Vertical clips along the jamb, approximately 127 mm – 203 mm (5” – 8”) o.c. from ends and at mid-span
    - For the vertical clips along mid-span of the wall, the clips were installed onto the panels on one half of the wall, then a spline snapped into place. The panels on the other half of the wall would slide into this spline

Pressure Equalization Wall Setup: A 99” wide by 99” high steel stud wall was constructed using 16 ga. 2x6 steel studs placed at 16” on center. The wall was then sheathed with 1/2” thick clear poly carbonate sheet. The rain screen panel system was installed onto the clear polycarbonate in a manner consistent with normal construction procedures for the system. Nominal 2x12 spf was then cladded around the assembly, secured into the steel stud/track using #8x 2-1/2” flat-head screws at approximately 305 mm (12”) o.c. The joints and edges of the poly carbonate sheet and test frame were sealed with blue sheathing (Tuck) tape.

Uniform Load Test Wall Setup: A 96” wide by 96” high steel stud wall was constructed using 18 ga. 2x6 steel studs placed at 16” on center. The wall was then sheathed with 1/2” thick Denseglas. A series of 1-1/4” holes were drilled through the Denseglas then a sheet of 6 mil polyethylene film that was applied over top. The drilled holes and film was applied in such a way that it would provide even pressure across the entire system. The rain screen panel system was then installed over top in a manner consistent with normal construction procedures for this system as noted above. Nominal 2x12 spf was then cladded around the assembly, secured into the steel stud/track using #8x 2-1/2” flat-head screws at approximately 305 mm (12”) o.c. The joints and edges of the poly sheet and test frame were sealed with blue sheathing (Tuck) tape.

Drawings provided by the client can be found within Section 10 of this report.

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SECTION 7
TEST RESULTS

AIR LEAKAGE RESISTANCE

Air leakage test data is indicated in the following table:

Test Pressure for all samples	75 Pa
Overall Area of each sample	6.23 m^2 (67.04 ft^2)
Air Leakage	0.6 L/s*m^2 (0.12 cfm/ft^2)
No. of 1/8" Holes Drilled	27

PRESSURE EQUALIZATION

During the Pressure Equalization test cycling at a pressure differential from 240 Pa (5 psf) to 1200 Pa (25 psf) for 100 cycles the systems lag times was below the required 0.08 seconds and the differential between the cavities and cyclic wind pressure did not exceed 50% of the maximum test pressure. Refer to Section 11 for a graph on one cycle during this test. The tested specimen **met** the performance requirements for Pressure Equalization of AAMA 508.

STATIC WATER PENETRATION RESISTANCE

During the 15-minute test period, using a pressure differential of 720 Pa (15 psf), there was no water leakage observed through the tested sample. The sample **met** the performance requirements for Static Water Penetration of ASTM E331.

DYNAMIC WATER PENETRATION RESISTANCE

During the 15-minute test period, using wind speed of approximately 120 kph (75 mph), no water leakage was observed through the tested sample. The sample **met** the performance requirements for Dynamic Water Penetration of AAMA 501.1.

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UNIFORM LOAD

After the test loads were released, the sample was inspected and there was found to be no permanent deformation or structural distress in the assembly. The assembly had **met** the performance requirements of ASTM E330 at the load specified in the table below:

Table 1. Uniform Load Results

Load, psf	Deflection, mm					
	1	2	3	4	5	6
5 (pre-load)						
0	0.00	0.00	0.00	0.00	0.00	0.00
5	0.15	0.43	0.61	4.39	0.11	4.49
0	0.10	0.00	0.05	0.20	0.00	0.15
10	0.57	1.33	1.98	9.79	0.34	9.97
0	0.20	0.15	0.20	0.55	0.10	0.40
15	0.64	1.48	2.15	10.39	0.40	10.58
0	0.15	0.20	0.20	0.70	0.05	0.55
20	1.00	2.09	3.20	13.13	0.63	13.24
0	0.15	0.20	0.30	0.95	0.00	0.75
25	1.19	2.47	3.72	14.31	0.83	14.47
0	0.20	0.25	0.30	0.95	0.00	0.80
30	1.67	3.23	4.98	16.71	1.15	16.97
0	0.20	0.40	0.50	1.20	0.00	1.10
35	1.97	3.76	5.80	18.3	1.39	18.51
0	0.20	0.50	0.55	1.25	0.05	1.30
40	2.45	4.36	6.77	19.91	1.67	20.11
0	0.30	0.60	0.65	1.45	0.10	1.40
45	2.81	4.98	7.84	21.25	1.97	21.58
0	0.30	0.70	0.80	1.55	0.15	1.60
50	3.23	5.67	8.90	22.82	2.29	23.12
0	0.40	0.95	0.95	1.75	0.15	1.70
55	3.69	6.39	10.04	24.29	2.63	24.54
0	0.45	1.00	1.05	1.80	0.20	1.90
60	4.19	7.14	11.28	25.92	3.01	26.18
0	0.50	1.25	1.30	2.00	0.25	2.15
65	5.25	8.00	12.66	27.64	3.61	27.65
0	0.60	1.30	1.35	1.90	0.30	1.80
70	6.33	8.90	13.88	29.3	3.78	28.99
0	1.50	1.75	1.50	2.25	0.40	2.35
Gauges removed at this point and loaded in 5 psf increments until failure						

Ultimate Load	115 psf	**Mode of Failure**	During the 120 psf loading sequence, the track along the right side ripped away from the wall.

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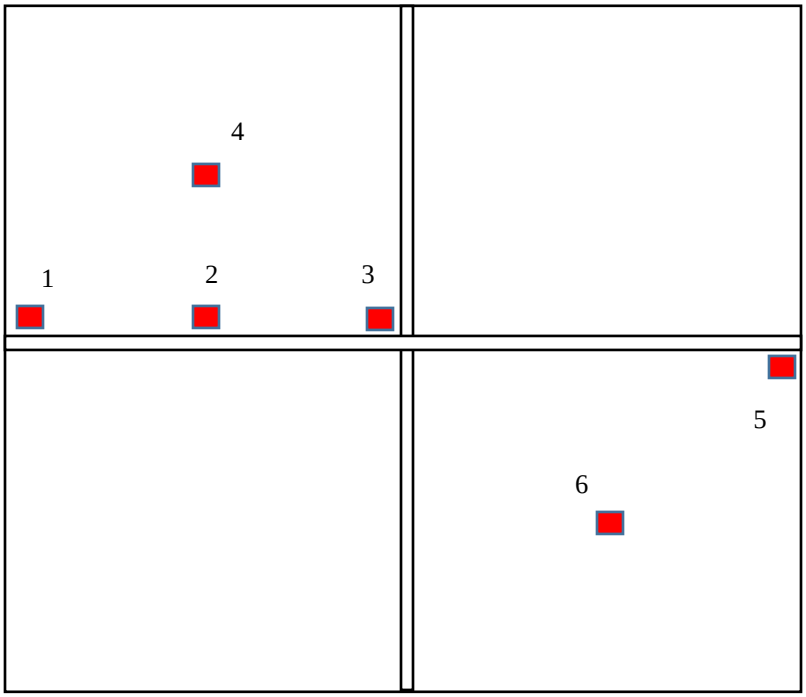
Below are the locations for the deflection gauges:



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SECTION 8
CONCLUSION

The test specimen met the specified performance requirements as described in Section 7.

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SECTION 9
PHOTOGRAPHS

Photo No. 1
APS Rain Screen Panel System

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Photo No. 2
Clip Spacing for the Panels

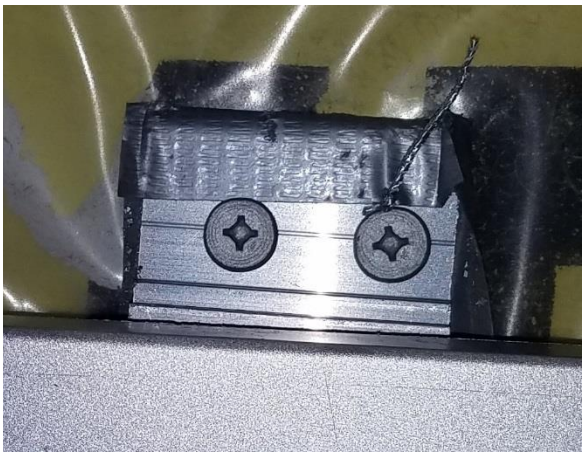

Photo No. 3
Installation Clips

**Note – The duct tape was there only to help protect the poly film from tearing when under load*

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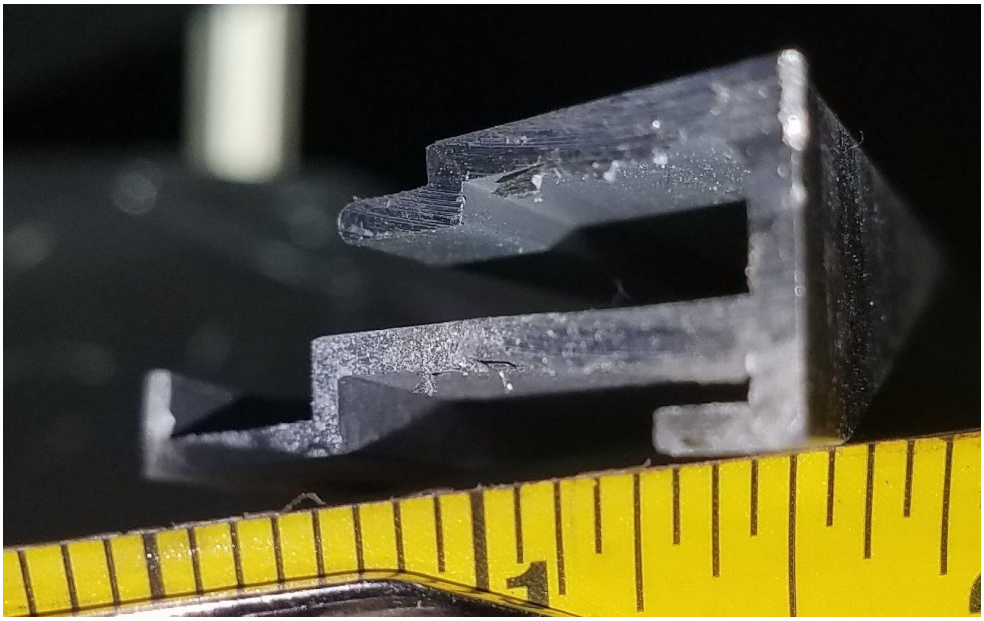

Photo No. 4
Panel Frame Extrusion

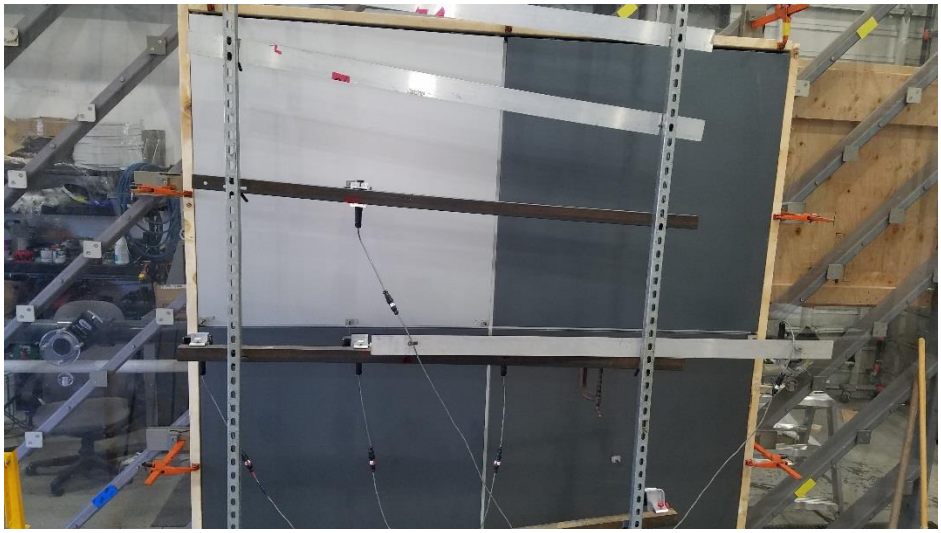

Photo No. 5
Test setup – Uniform Load Test

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SECTION 10
DRAWINGS

The drawings for the APS Rain Screen Panel System, as provided by the client, have been reviewed by Intertek B&C and are representative of the sample reported herein. Sample construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

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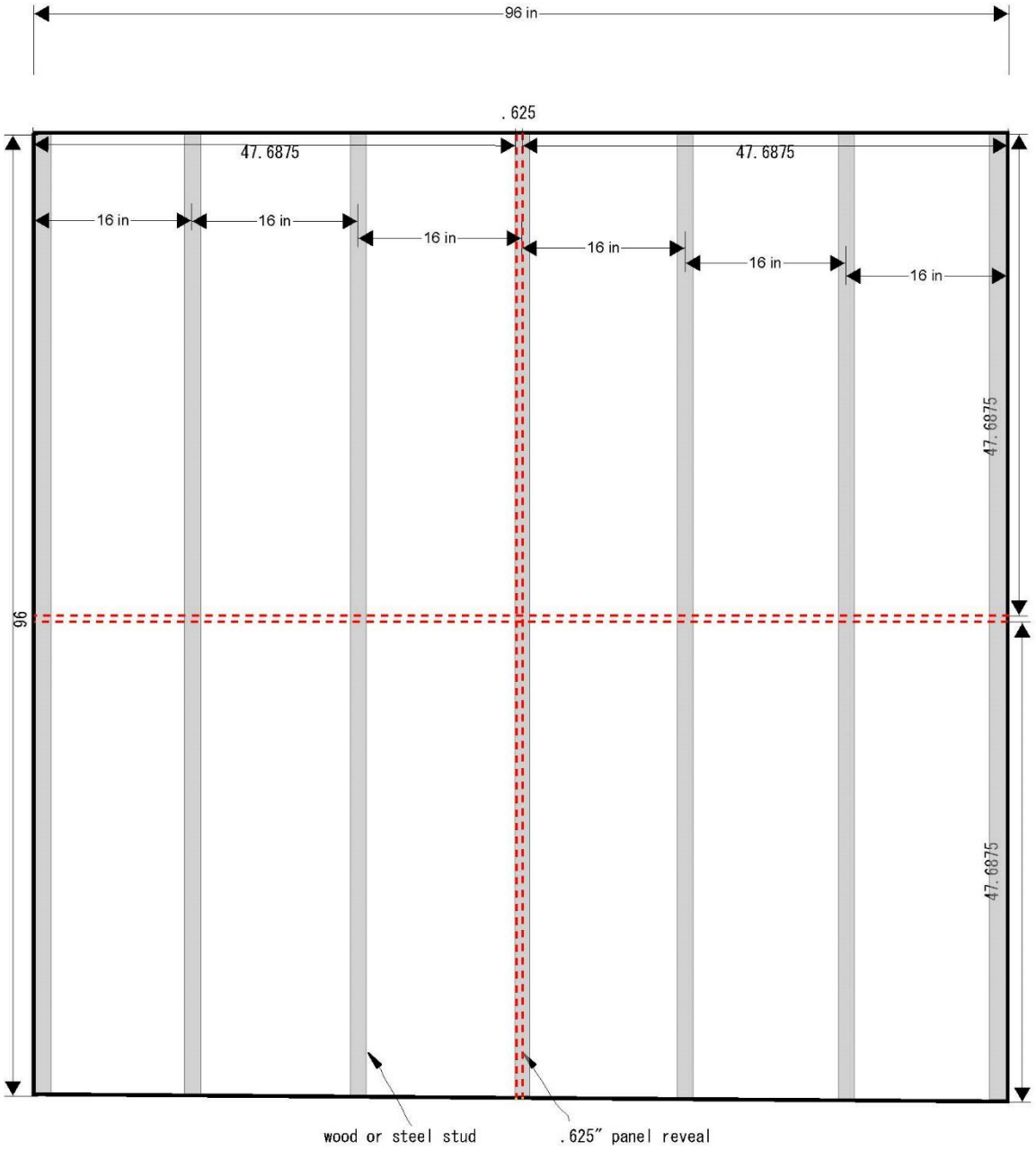

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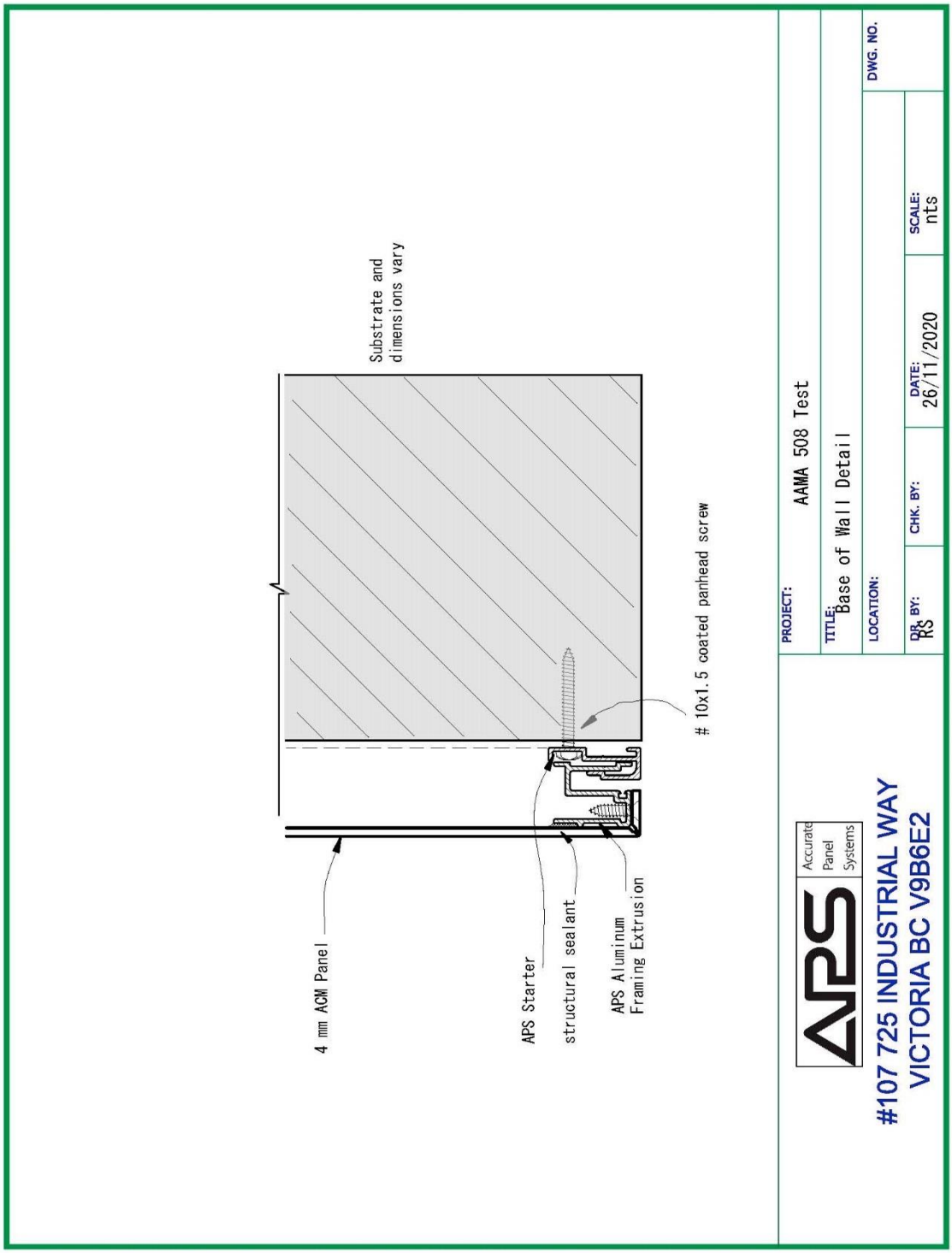

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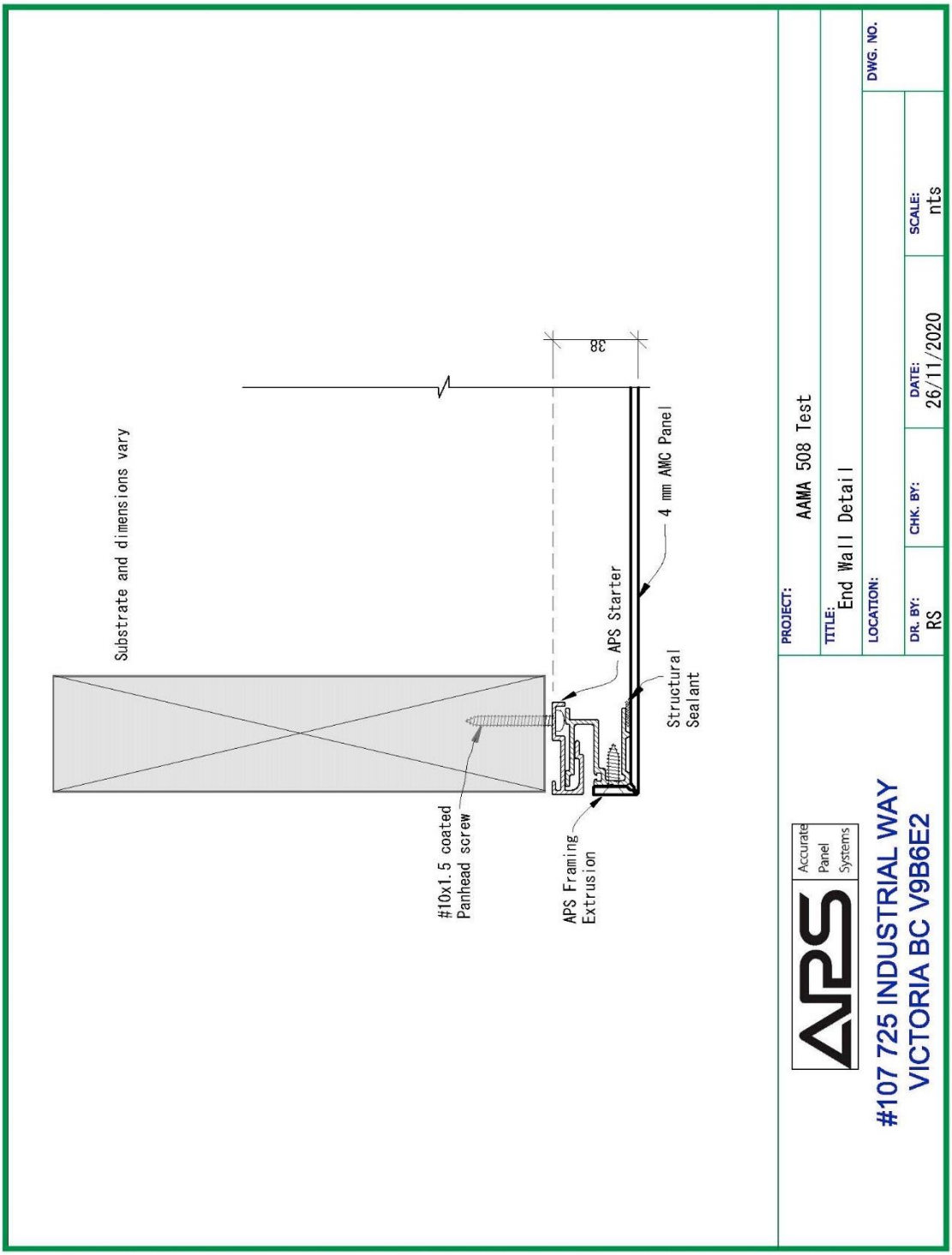

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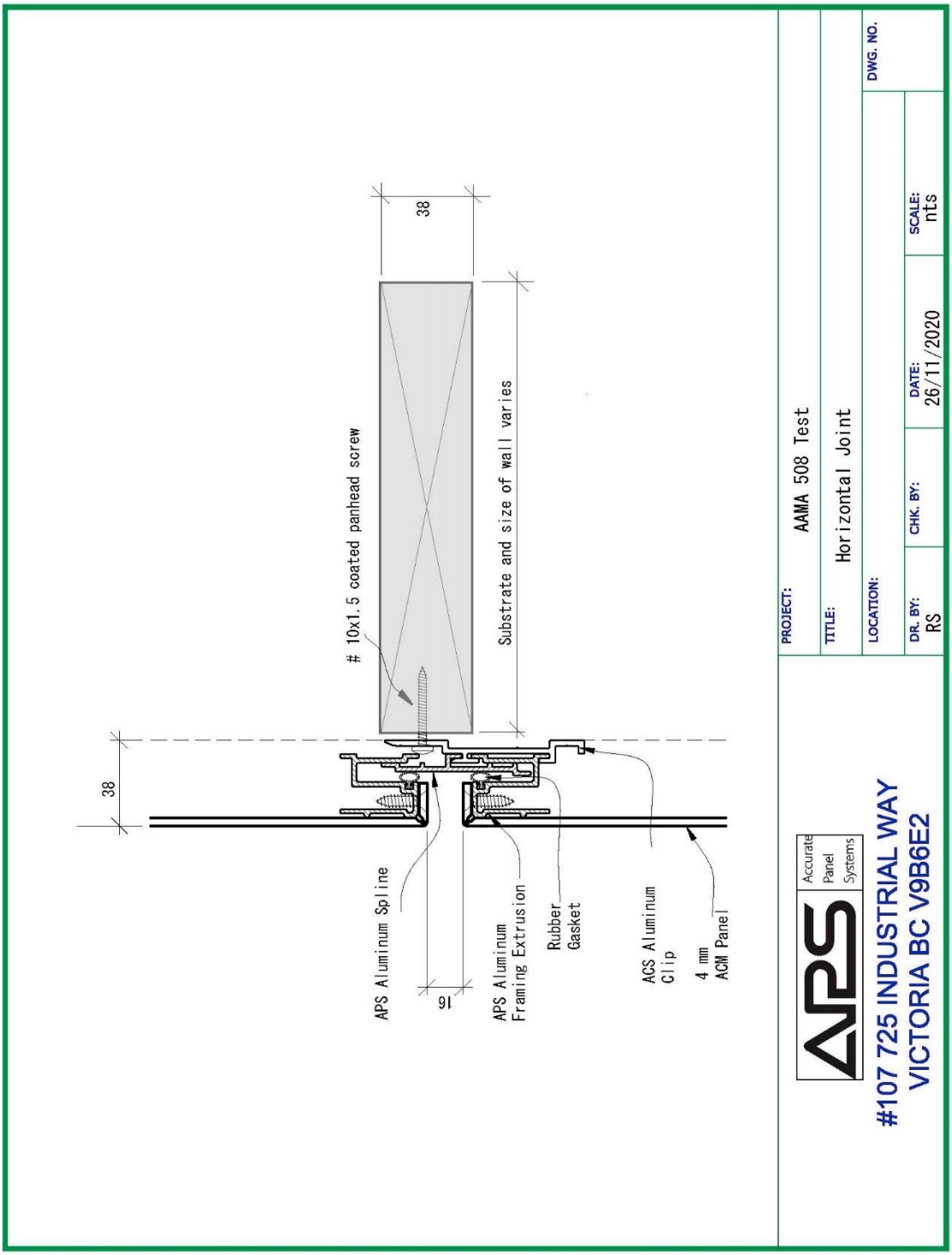

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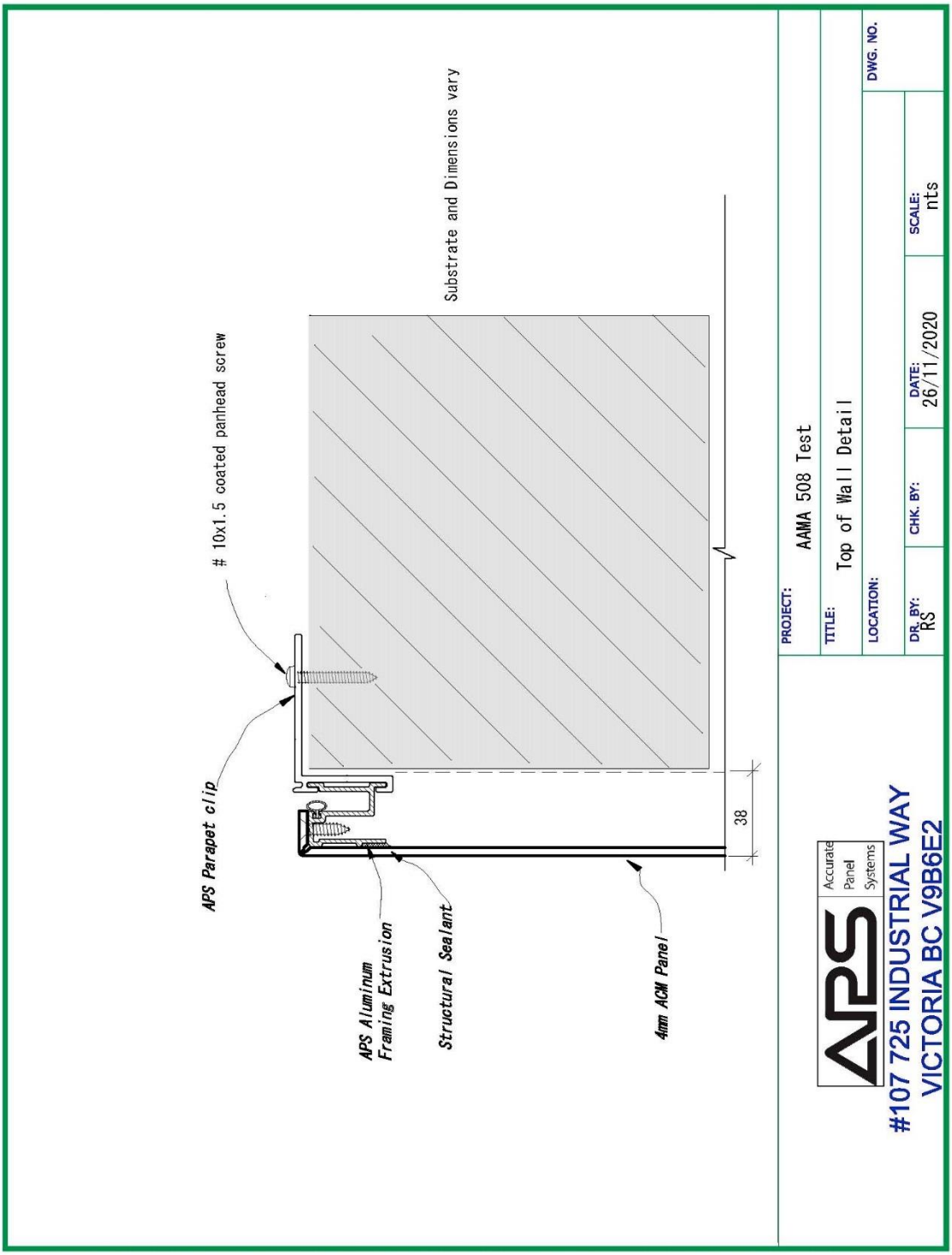

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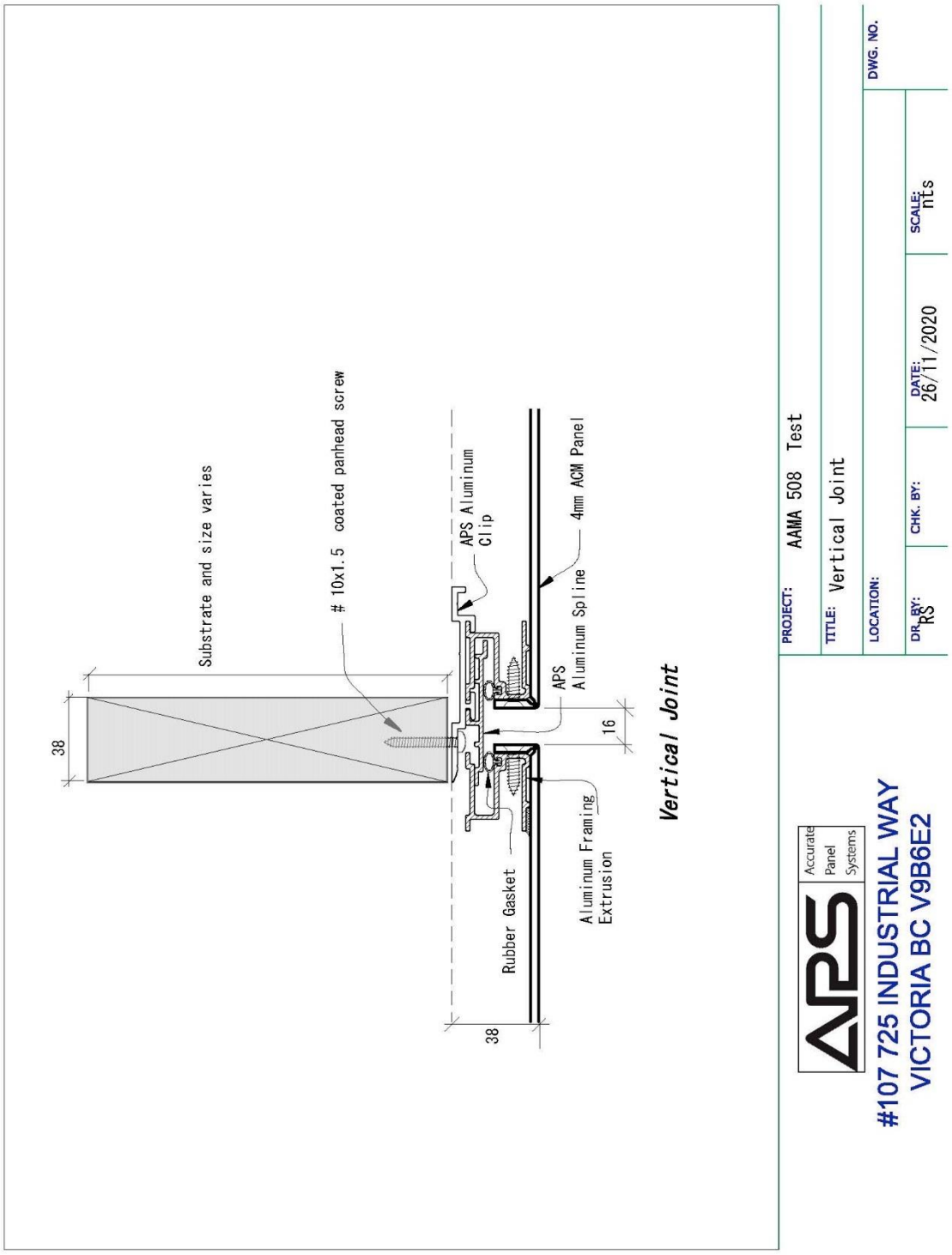

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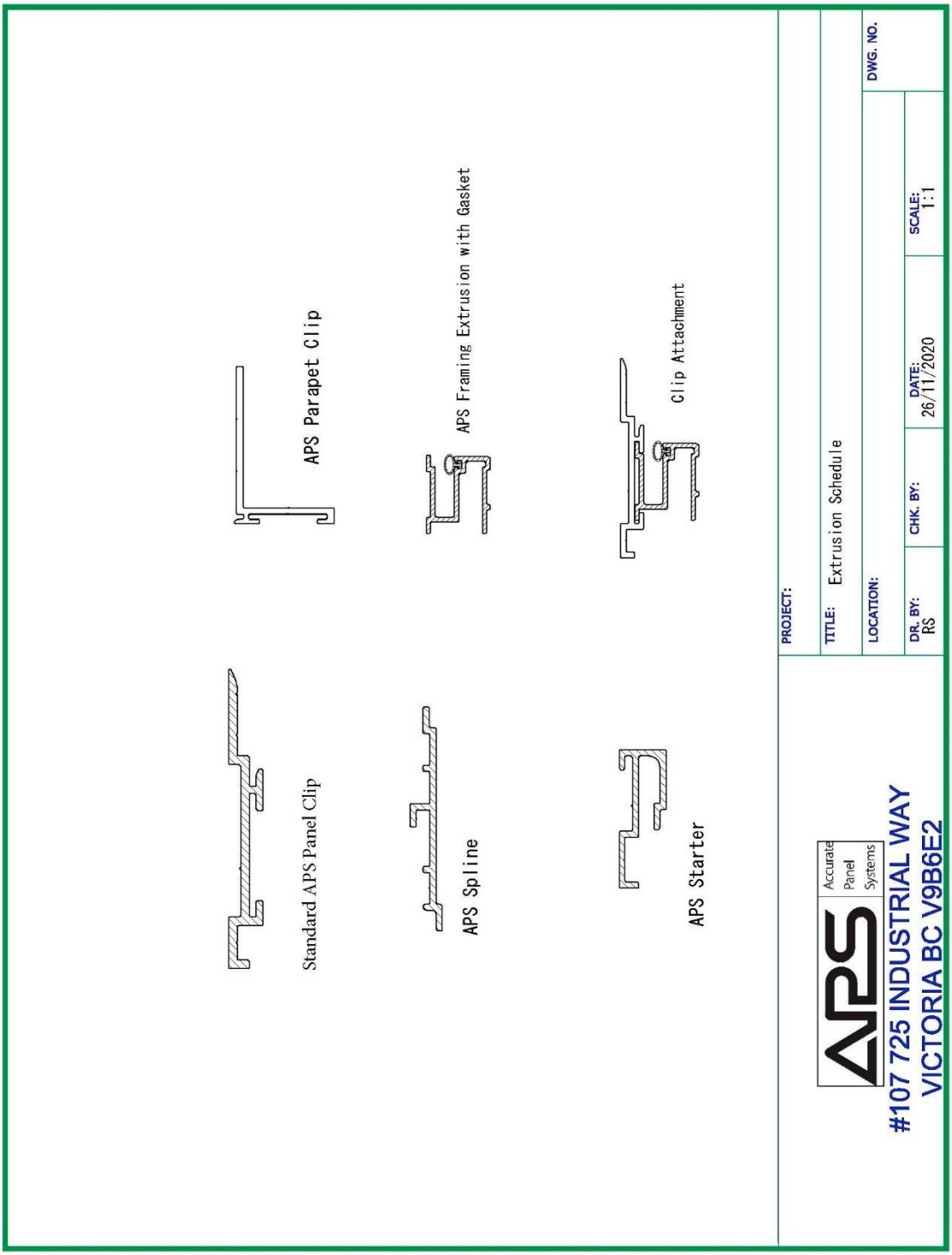

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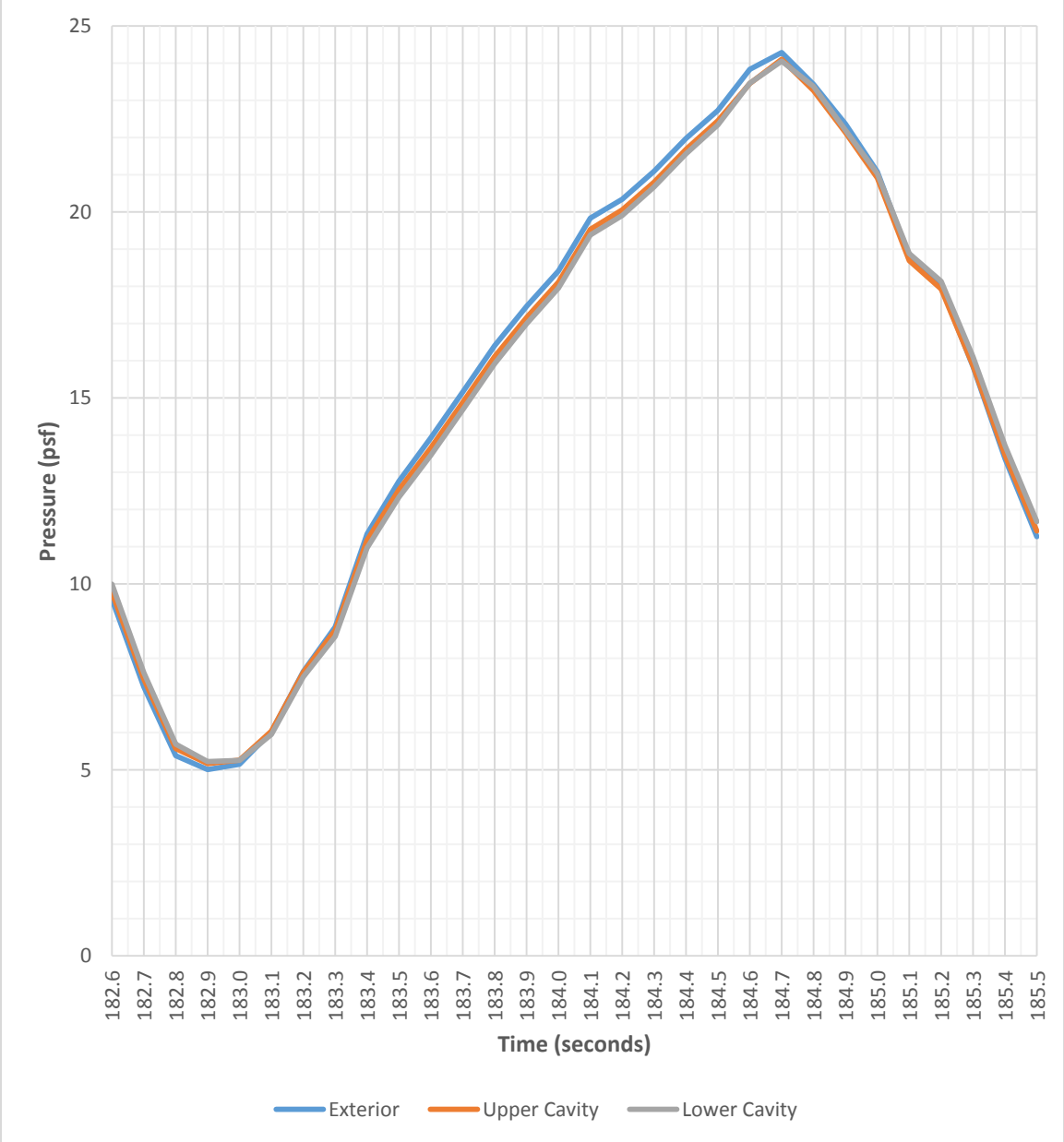
SECTION 11
PRESSURE EQUALIZATION GRAPH



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SECTION 12
REVISION LOG

REVISION #	DATE	SECTION	REVISION
0	12/17/20	N/A	Original Report Issue