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VOLUNTARY TEST AND CLASSIFICATION METHOD FOR DRAINED AND BACK VENTILATED RAIN SCREEN WALL CLADDING SYSTEM OF THE

"DIZAL ARCHITECTURAL ALUMINUM PANEL"

IN ACCORDANCE WITH AAMA 501.1-17 AND IN CONJUNCTION WITH AAMA 509-14 WALL CLADDING SYSTEM

Report to:	**Dizal** 4000 Jean-Marchand, Suite 108 Quebec, QC G2C 1Y6
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Report No.:	19-06-B0208-4 7 Pages, 1 Appendix
Proposal No.:	19-006-111940 RV1
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1.0 INTRODUCTION

Element Materials Technology Inc. was retained to evaluate the "Dizal Architectural Aluminum Panel" rain screen cladding system in accordance with AAMA 501.1-17 and in conjunction AAMA 509-14 as outlined in Proposal number 19-006-111940 RV1.

Note: The contents of this document refer to only the dynamic water penetration resistance subsection as outlined in AAMA 509-14.

Upon receipt, the specimen was assigned the following Element Specimen Number:

Client Specimen Description	**Element Specimen No.**
Dizal Architectural Aluminum Panel *(Equal Panel Scheme / 4 panels)*	19-06-B0208-1

2.0 PROCEDURE

Test Description	Test Method
Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure	AAMA 501.1-17
Voluntary Test Method and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding Systems Dynamic Water Penetration	AAMA 509-14, Section 5.9.4 – *Referencing AAMA 501.1-17*

Note: SI units are the primary units of measure.

2.0 PROCEDURE (CONTINUED)

Test Wall Section Description & Details:

The back-up test wall section (air / water barrier) was constructed in an Element test frame as per the detail drawing below in accordance with AAMA 509-14, Section 5.0.

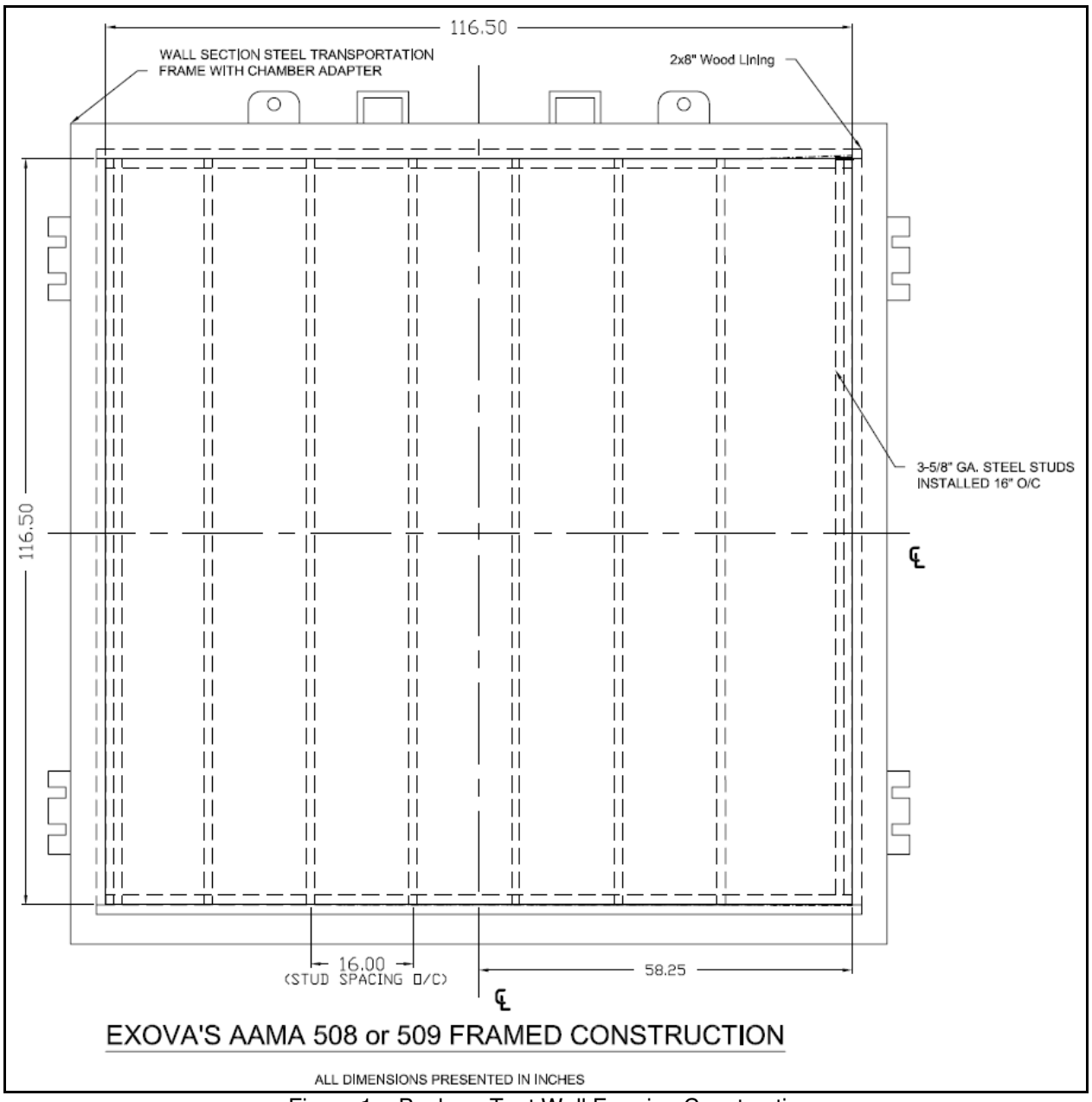

Figure 1 – Back-up Test Wall Framing Construction

2.0 PROCEDURE (CONTINUED)

Upon completion of the back-up wall, the Plexiglas joints and screw-heads were sealed to ensure the assembly was air-tight. The water drainage trough or collection system was installed onto the simulated AWB assembly, and a gate valve was installed in the upper section of the specimen as to not to restrict water drainage during water testing as per AAMA 509-14, Section 5.2.5.

Before the water tests, as per Section 5.4.1, 3 mm (0.118 inch) diameter holes were introduced equally spaced along the collection trough in order for the air / water barrier to have an air leakage rate of 0.6 $L/s \cdot m^2$ (0.12 cfm/ft^2) ± 10% at 75 Pa (1.57 psf).

The test wall was uniformly dynamic pressurized at test pressures of 300 Pa (6.27 psf) and 577 Pa (12.05 psf). During each water penetration test, all water was collected that drained off of and/or penetrated through the defect holes in the air / water barrier. The water was weighed and the amount reported.

The application of the cladding system on the test back-up wall was performed by Dizal, authorized personnel on March 11, 2020, see Section 3.0 for details. As permitted by AAMA 509-14, Note 5, the perimeter of the specimen was sealed to the fixture that the wall section was constructed into. No drainage/vent holes or critical areas of the specimen that would be affected by water infiltration / drainage or differential pressure were obstructed.

3.0 TEST PANEL DESCRIPTION AND CONSTRUCTION

The following description and construction was provided by Dizal.

Rain Screen Panel Description: Aluminum composite panels were 4 mm (0.165'') thick. The panels were constructed with a 3.2 mm (0.125'') thick plastic core and two 0.4 mm (0.015'') thick aluminum interior and exterior skins, adhered to the plastic core. The edges of all panels utilized a "J" shaped, aluminum perimeter extrusion, which is adhered to the aluminum composite panel with continuous 3M VHB tape. An "H" shaped aluminum extrusion "stiffener", 20 mm (0.78'') wide x 13.55 mm (0.53'') thick was adhered to the back of each panel with 3M VHB tape.

Rain Screen Wall Construction Description: The sill utilized a two-piece "starter strip base and finishing cap" along the entire length of the wall, secured to the steel studs with #8 x 1'' long Tek screws, spaced 406 mm (16'') on center. The bottom panels were slid into the "starter strip" and secured to the steel studs with 609 mm (24'') long "double fastening strip" using #8 x 1'' long Tek screws, spaced 406 mm (16'') on center. The top panels were then slid into the horizontal "double fastening strips" and secured at the head with 1218 mm (48'') long "starter strips" using #8 x 1'' long Tek screws, spaced 406 mm (16'') on center. An aluminum extrusion "screw cover strip" was used in the vertical and horizontal joints to conceal the screws and "double fastening strips".

For details of the rain screen panel system, see Appendix A.

4.0 RESULTS

Table 1 – AAMA 509-14, Section 5.9.4, Referencing AAMA 501.1-17 Dynamic Water Penetration Test [1] Element Specimen Number: 19-06-B0208-1 *(Test Date: April 9, 2020)*			
Test Pressure	**Requirements**	**Test Results**	**Comment**
300 Pa [2] *(12.05 psf)* (15-Minutes)	All water that penetrates the exterior rain screen cladding shall be controlled and drained to the exterior. All water that contacts the air / water barrier shall be visually observed and recorded: a) Water mist or droplets on the air/water barrier surface; and/or b) Water in continuous stream on the air/water barrier surface.	Water mist and/or droplets were observed. All water that penetrated the exterior rain screen cladding was controlled and drained to the exterior with some continuous streaming observed.	**Meets Requirements**
577 Pa [3] *(12.05 psf)* (15-Minutes)	All water that penetrates the exterior rain screen cladding shall be controlled and drained to the exterior. All water that contacts the air / water barrier shall be visually observed and recorded: a) Water mist or droplets on the air/water barrier surface; and/or b) Water in continuous stream on the air/water barrier surface.	Water mist and/or droplets were observed. All water that penetrated the exterior rain screen cladding was controlled and drained to the exterior with some continuous streaming observed.	**Meets Requirements**

[1] Thirty-Six (36) 3 mm diameter holes were drilled through the Plexiglas substrate, equally spaced, 6" above the drainage tracks. These penetrations were employed to simulate an air / water resistive barrier sheathing membrane imperfections in general accordance with AAMA 509-14, Section 5.2.2.

[2] 300 Pa = 22.1 m/s (or *50 mph* / 79 km/h). Calculation based on the Ensewiler formula, where $P = 0.613 \cdot V^2$, V is m/s & P is N/m^2

[3] 577 Pa = 30.7 m/s (or *69 mph* / 110 km/h). Calculation based on the Ensewiler formula, where $P = 0.613 \cdot V^2$, V is m/s & P is N/m^2

Table 2 – AAMA 509-14, Section 5.9.3 – Referencing ASTM E331-00 (2016) Water Collected Off / Through the AWB Element Specimen No.: 19-06-B0208-1 *(Test Date: April 8, 2020)*					
Data	**300 Pa *(6.27 psf)* Dynamic**	**577 Pa *(12.05 psf)* Dynamic**	**TTL mL *(oz.)***	**Sum mL/m² *(oz./ft²)***	**Average mL/m² *(oz./ft²)***
Liquid mL *(oz.)*	196 (6.91)	310 *(10.93)*	506 *(17.85)*	Not Required	Not Required
ml/m2 *(oz./ft²)*	32 *(0.10)*	51 *(0.17)*	Not Required	83 *(0.27)*	21 *(0.07)*

4.0 RESULTS (CONTIUNED)

Outdoor Conditions during Test:

Temperature:	8.5 °C *(47.3 °F)*
Relative Humidity:	81% R.H.
Barometric Pressure:	99.6 kPa *(29.4 inHg)*

Figure 2 – AAMA 501.1, Dynamic Water Penetration Test

5.0 SYSTEM MODIFICATIONS

No modifications were made to the system as shown respectively in Appendix A.

6.0 DISCUSSION

The Dizal, *"*Dizal Architectural Aluminum Panel*" (Element Specimen No. 19-06-B0208-1)* identified in this report was tested to ASTM E331-00 (2016) and the results are reported herein.

7.0 REVISION HISTORY

Report No:	**Date:**	**Description of Revisions:**
19-06-B0208-4	May 7, 2020	Original Document

Reported & Authorized by:

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Reviewed by:

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Ops. Manager, Building Science & Fire Testing
Technical Manager, Building Systems
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APPENDIX A

Mock-Up Rain Screen Drawings and Product Information

(4 Pages)

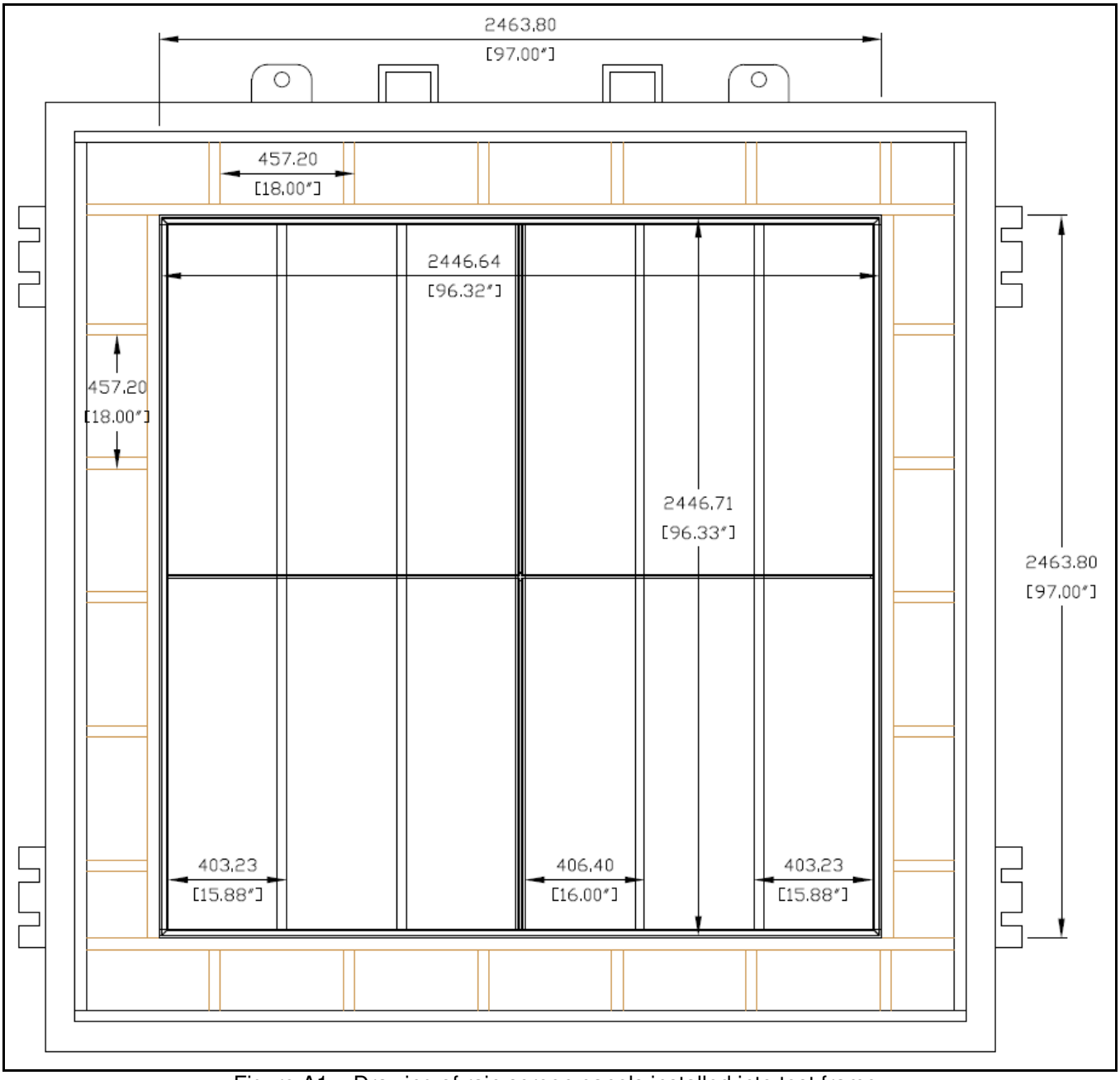

Figure A1 – Drawing of rain screen panels installed into test frame.


HIGH DEFINITION PRINTING
ALUMINUM
Highly resistant commercial grade, fire-resistant aluminum. Exceptional strength to weight ratio, perfect for all types of applications, interior and exterior.
PRIMER COAT
Specially formulated primer coat assures optimal adhesion between ACM panels and digital inkjet print.
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A high-definition digital inkjet printer is used to print images of a wide range of scanned textures and outstanding color variations.
Z-CLEAR
A protective clear coat is applied to provide long-term protection against UV rays and fading.
TESTS & CERTIFICATIONS*
. ASTM E84 - Fire Resistance
. ASTM G155 - UV Resistance
. ASTM E283 - Static air infiltration
. ASTM E330 - Structural performance
. ASTM D6578 - Graffiti Resistance
. ASTM D3359 - Adhesion Testing
. ASTM E331 - Static water contacting AWB
. AAMA 501.1 - Dynamic Water infiltration test
. AAMA 509 - Rain Screen Performance
. ASTM D4060 - Abrasion Resistance
. LEED V4
* visit our website at www.dizal.com for more information
DIZAL

PARTS AND ACCESSORIES

STARTER STRIP AND FINISHING PART

- Two-part aluminum extrusion snapped together to hide screws.
- Color matching aluminum extrusion and joint.
- Innovative starter strip and finishing part creating unrivalled aesthetics.


DOUBLE FASTENING STRIP
Double-sided insertion rail allows for a fast and easy installation.
Symmetrical part can be used in any direction.
Predetermined joint spacing of 3/8'' (9,5 cm) between panels.
SCREW COVER STRIP
Aluminum extrusion painted to match joint color
Symmetrical part can be used in any direction.
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