

**ZERO**  
**RIVETS**

RIVETLESS™ PANEL SOLUTION



ARCHITECTURAL PANEL SYSTEM

# 100% CONCEALED FASTENERS

## ARCHITECTURAL PANEL TYPE

### EVO™ RIVETLESS™

Innovative – Patent Pending

Free of exposed fasteners

NO RIVETS = Elegant appearance

Superior Structural performance

Standardized System by design

Coast-2-Coast Mfg consistency

Available thru US & CDN partners

NFPA285 tested with EVOMAXci™

EVO™ Integrated Stiffener

Value Engineered: various finishes

EVOWOOD/EVOSTONE/EVOEXOTIC

Matched look = less load and \$ave

Able to replace individual panels

Panels are deliverable to site faster

## A PARADIGM SHIFT IN THE MAKING

Our objective is to establish the EVO™ RIVETLESS™ panel system as the highest standard of ACM panels, anywhere.

EVO's™ elegant appearance offers superior Value and Performance to any type of façade, simple or complex.

EVO's™ Exclusive Manufacturer's Network in North America, ensures Quality Assurance in production and installation procedures, attainable through our standardized system design. Architects, Developers and decision-makers, will appreciate excellence in our planning, execution, delivery and service follow thru, as being a signature of our Network.

The EVO™ Network provides a collaborative resource between manufacturer's to complete projects on-time, discuss innovations, remain competitively positioned with broad appeal in N. America and confidently be the leaders within their industry, year-after-year.

Future testing for compliance to: CAN/ULC S134-13, Miami-Dade HVHZ tests and others, will continue to position EVO™ RIVETLESS™ at the forefront of innovative solutions.

### RIVETTED (OTHERS)

Status Quo

Unightly screws and rivets

Color match screws and rivets

No manufacturing consistency between fabricators

## TESTED + CERTIFIED

Reaching New Heights with these Professionals



Intertek



EVOWOOD 

ZERO  
RIVETS

EVOSTONE 

ZERO  
RIVETS

# PERFORMANCE + TECH SPECS

## RAINSCREEN TESTING

AAMA 508 - 07 COMPLIANT  
Voluntary Test Method and Specification  
for Pressure Equalized  
Rain Screen Wall Cladding Systems

## AIR/WATER/WIND PERFORMANCE

AAMA 501.1-05 (Dynamic)  
ASTM E 1233 (Modified)  
ASTM E 283 (Static)  
ASTM E 330 (Static)  
ASTM E 331 (Static)

## EVO STONE PERFORMANCE

Evaluation of EVO STONE Coating  
System testing in accordance with:  
ASTM B117-11 (Salt Spray)  
ASTM D4541-09 (Adhesion Strength)  
ASTM D2794 (Impact Resistance)  
ASTM D6944-09 (Thermal Cycling)  
ASTM D2247-11 (Humidity Resistance)  
ASTM G155 (Accelerated Weathering)  
ASTM D1654 (Corrosion Creepback)  
ASTM G155-13 (Solar & Weathering)

## FIRE TEST METHOD

NFPA 285  
Standard Fire Test Method For  
Evaluation of Fire Propagation  
Characteristics of Exterior Non  
Load Bearing Wall Assemblies  
Containing Combustible Components

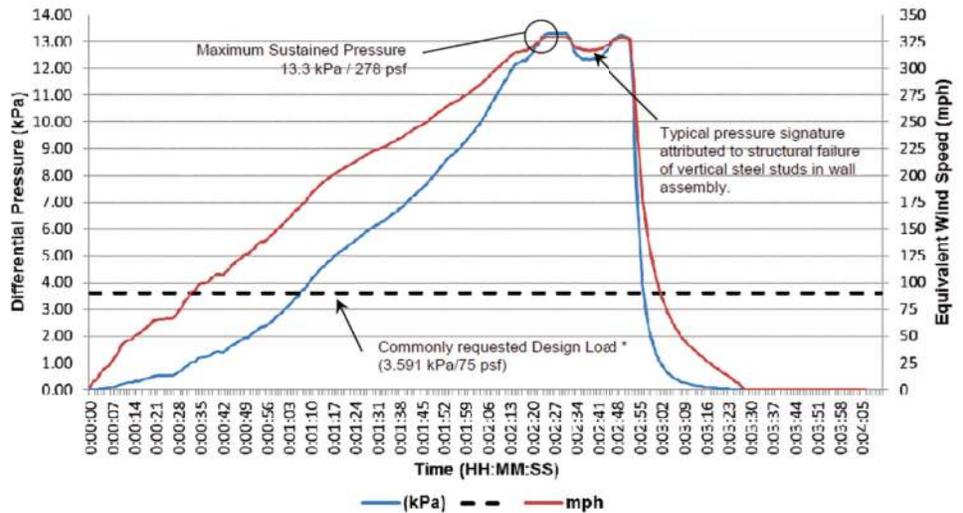
## MATERIAL SIZE AVAILABILITY

PE & FR core options with sheet material sizes  
W 50" | 62" L up to 196" T 4mm | 6mm

EVO™ Architectural Panel System (U.S. Pat. Pending)

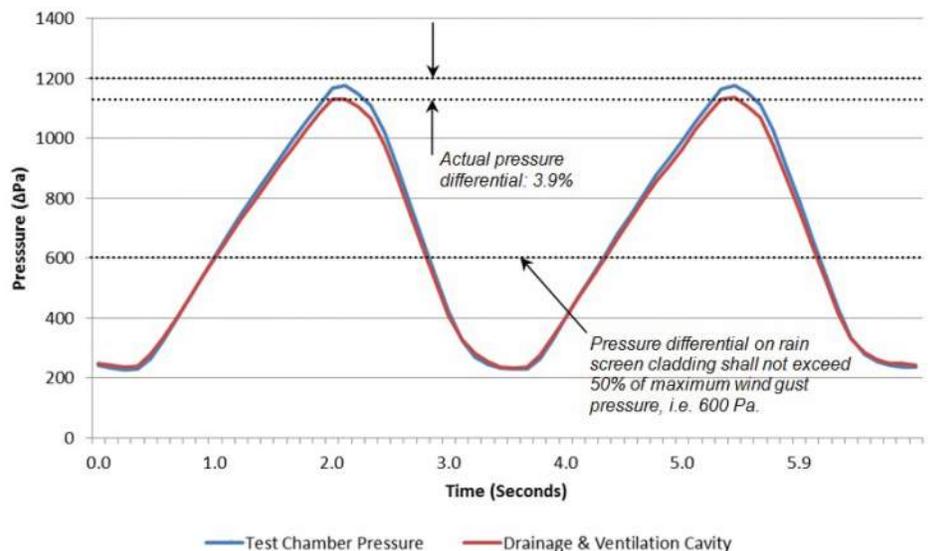
## DIFFERENTIAL PRESSURE & EQUIVALENT WIND SPEED VS. TIME (Loading to failure in the Negative Wind Load Direction)

Exova Specimen No: 15-06-M0134 | EVO™ RIVETLESS™



## AAMA 508-07 - PRESSURE EQUALIZATION BEHAVIOR

Exova Specimen No: 14-06-M0187-B | EVO™ RIVETLESS™



EVOEXOTIC<sup>+</sup>

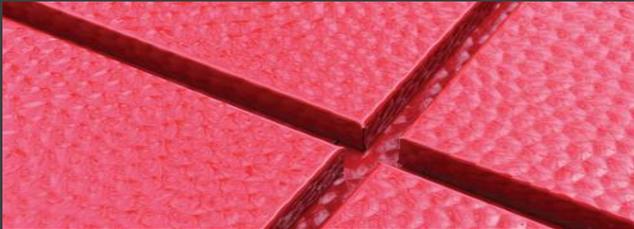
ZERO  
RIVETS

EVOPURE<sup>+</sup>

ZERO  
RIVETS

# CHANGING THE STANDARD BY DESIGN

## GUIDING PRINCIPLES BEHIND OUR EVO™ RIVETLESS™ SYSTEM



“Companies that do not practice Smart Lean Manufacturing are doomed to mediocrity & ultimately failure.”

J. LIKER



“For you to sleep well at night, the aesthetic, the quality, has to be carried all the way through.”

STEVE JOBS

“Design is not what it looks like and feels like. Design is how it works.”

STEVE JOBS



“Good design is nothing less than the translation of functional specifications. When it expresses & supports functionality, design becomes a selling point.”

EUGEN GASSMANN



Time savings through implementing Lean Manufacturing practices can result in: cost savings, cost avoidance, and indirect savings, benefiting project outcome measurably.





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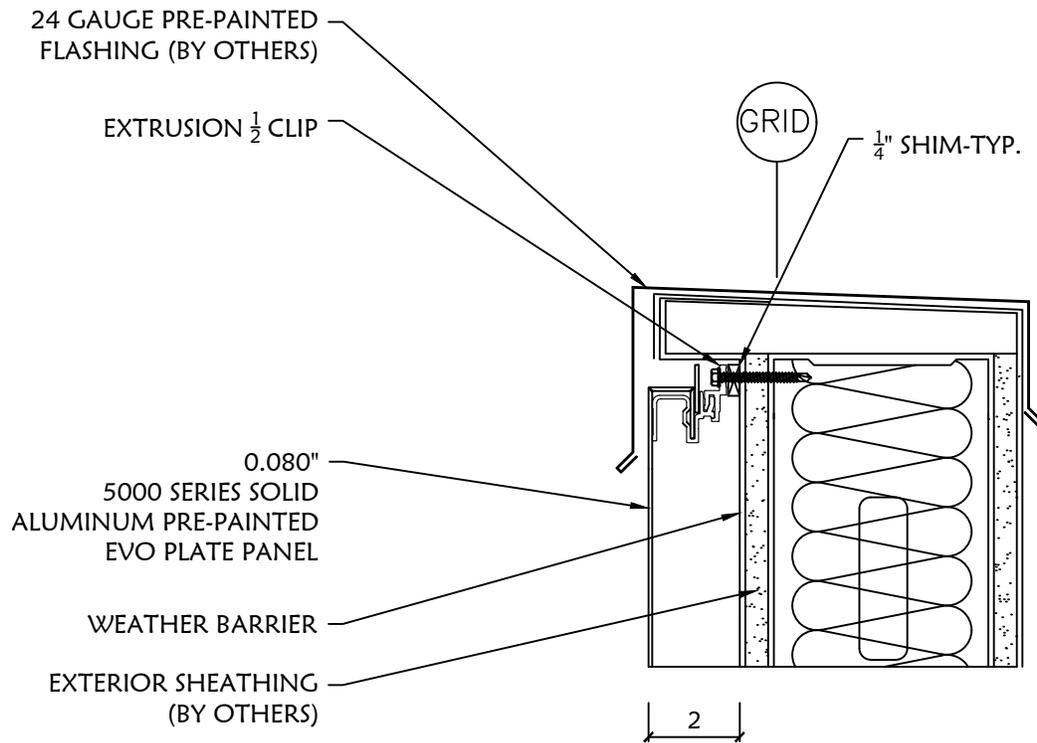
2720 S. MAIN ST, UNIT B., SANTA ANA, CA 92707

## **EVO SYSTEM<sup>®</sup>**

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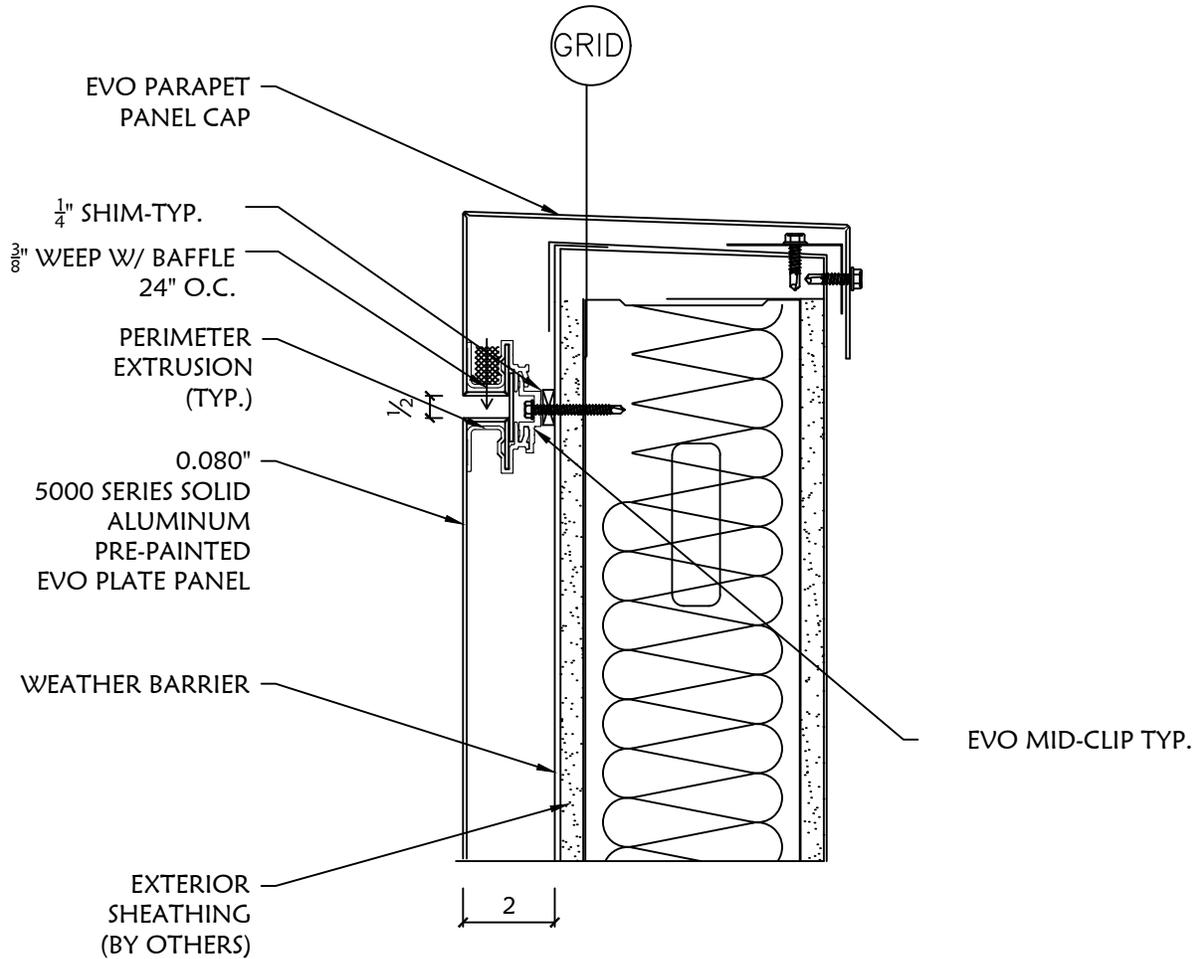
**EVO SYSTEM**®



PARAPET CAP

OC-01

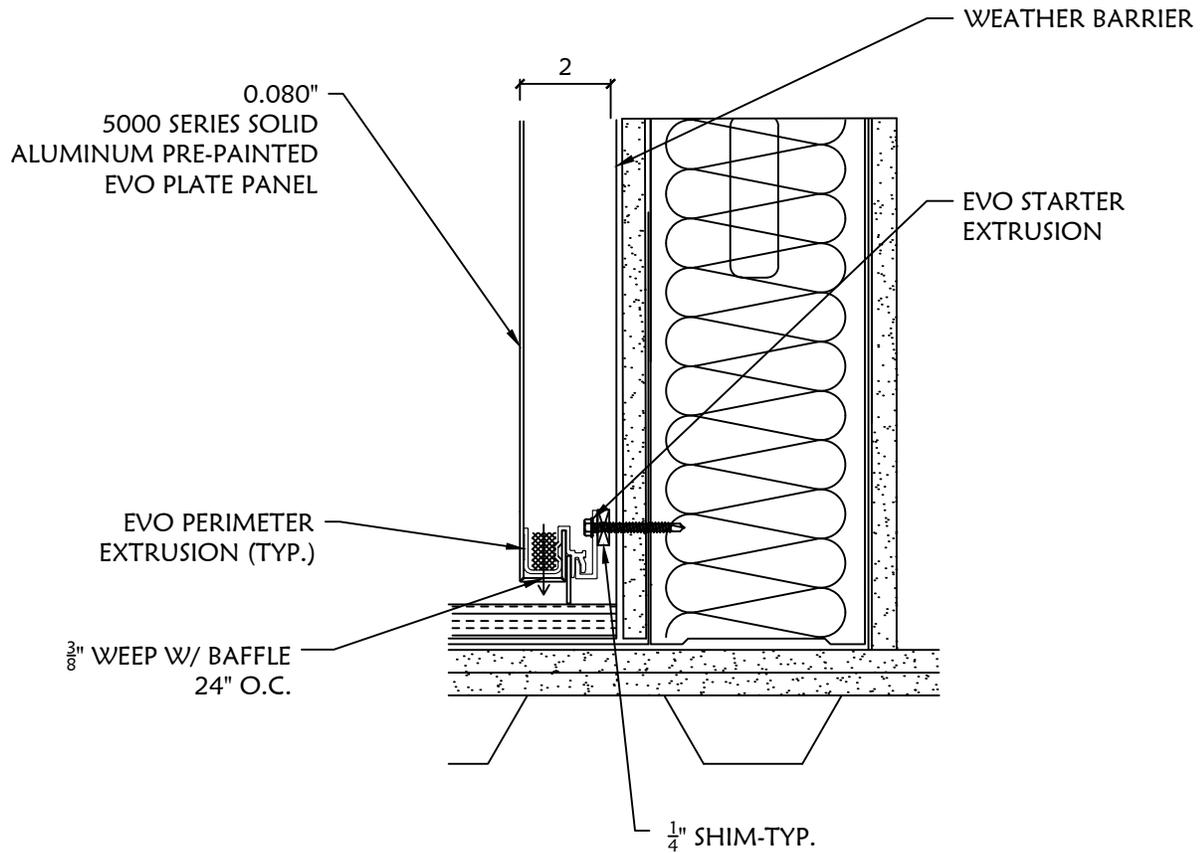
**EVO SYSTEM<sup>®</sup>**



EVO PARAPET CAP

OC-02

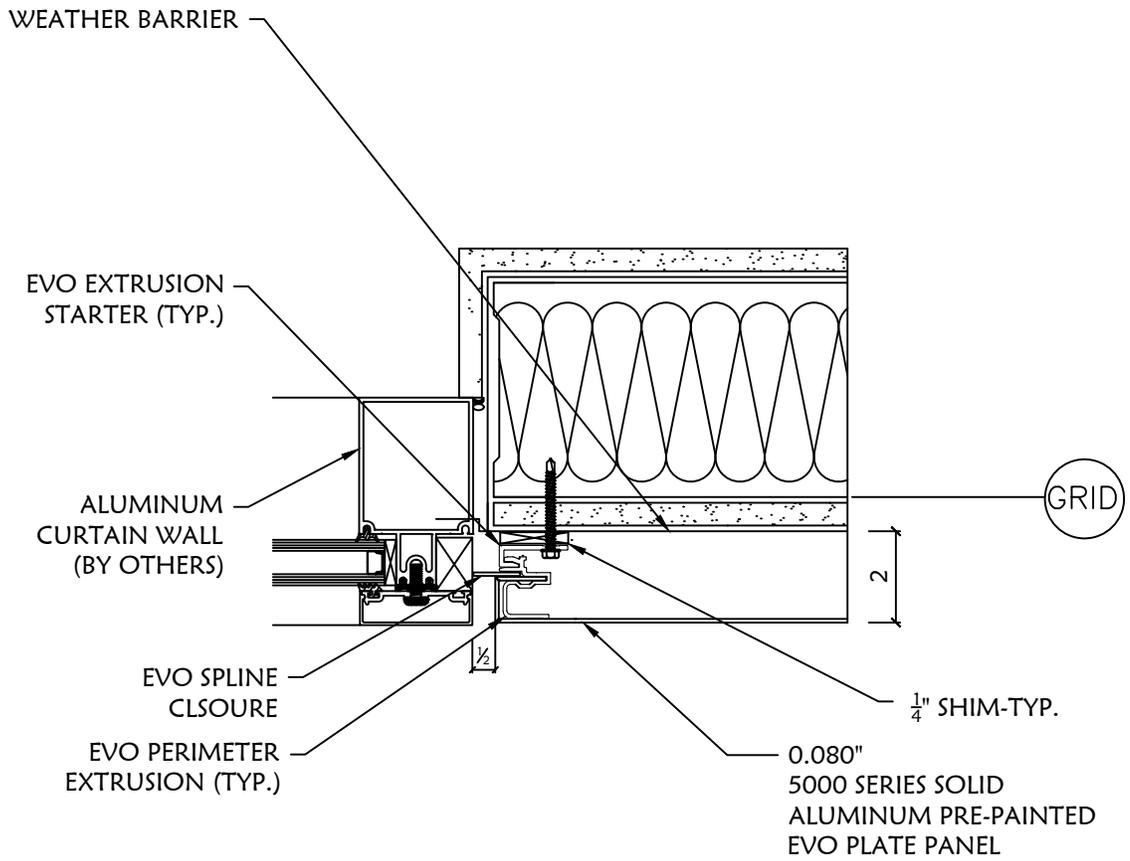
# EVO SYSTEM®



BASE DETAIL

OC-03

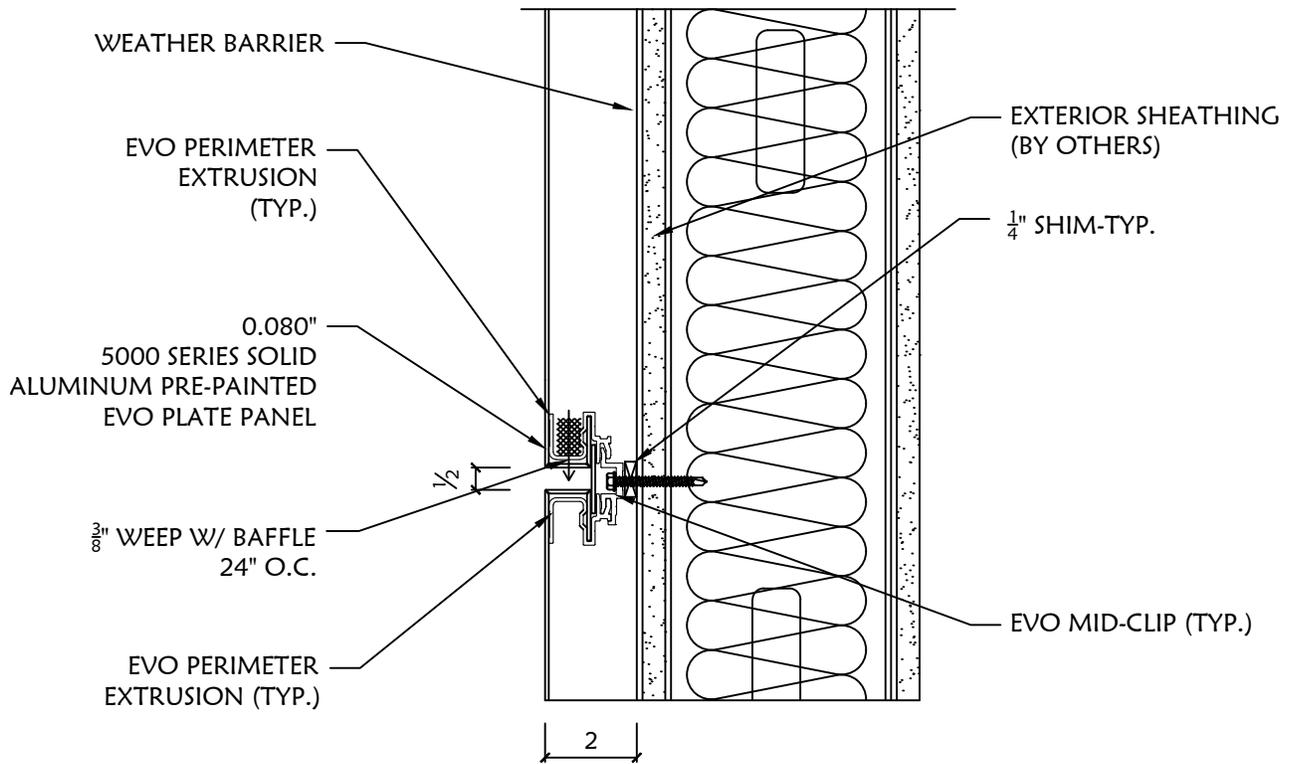
**EVO SYSTEM<sup>®</sup>**



JAMB DETAIL

OC-04

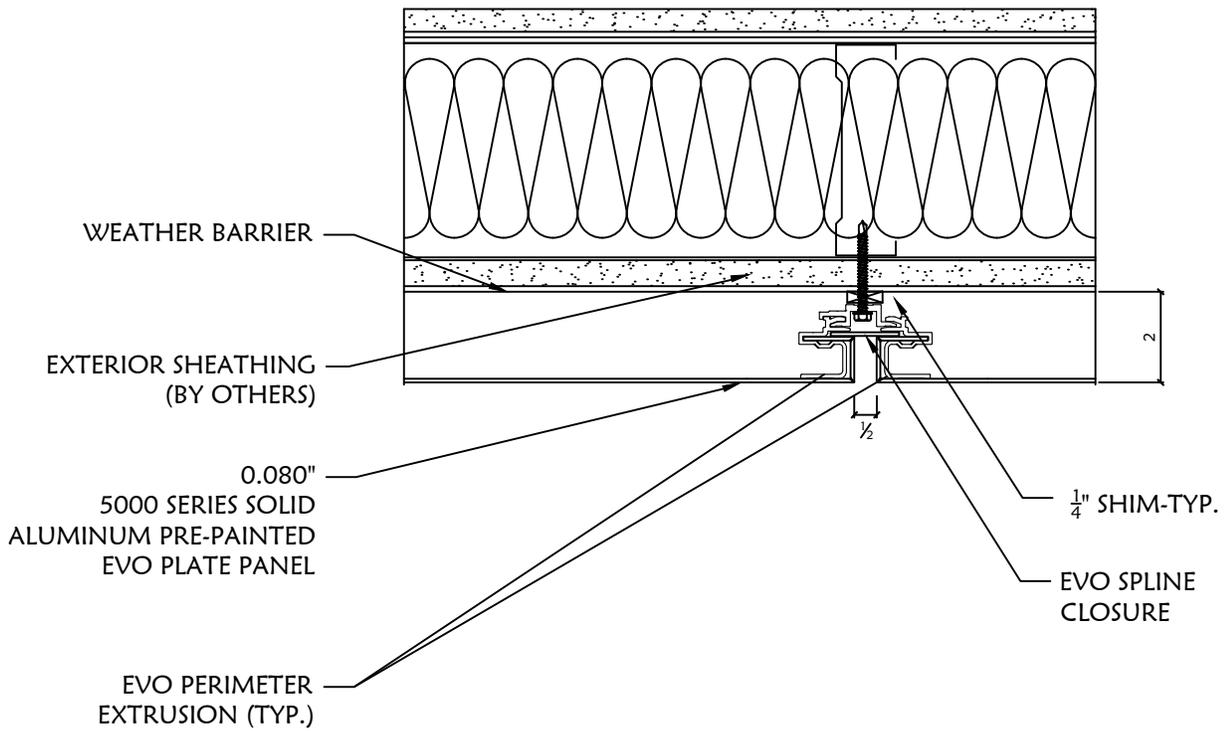
# EVO SYSTEM<sup>®</sup>



HORIZONTAL JOINT DETAIL

OC-05

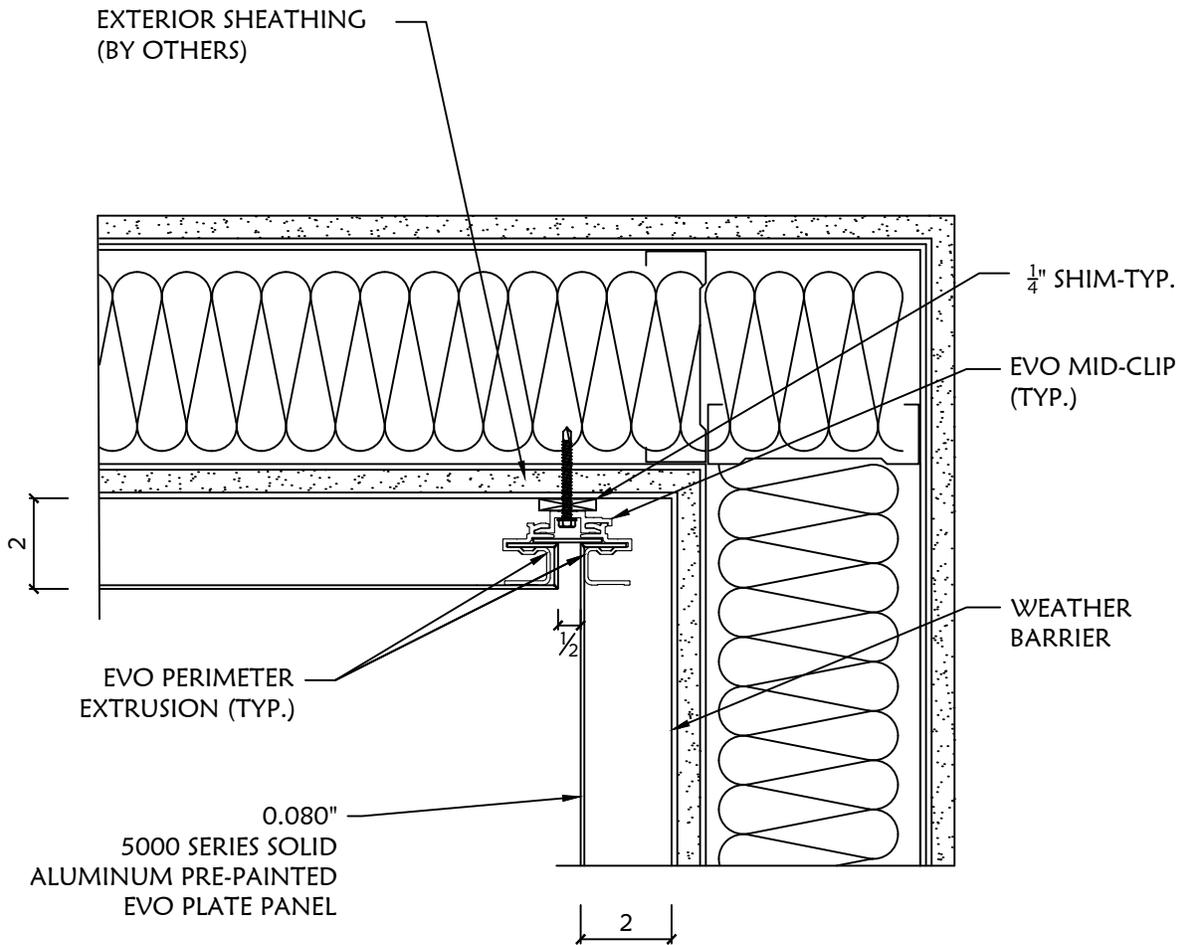
**EVO SYSTEM**®



VERTICAL JOINT DETAIL



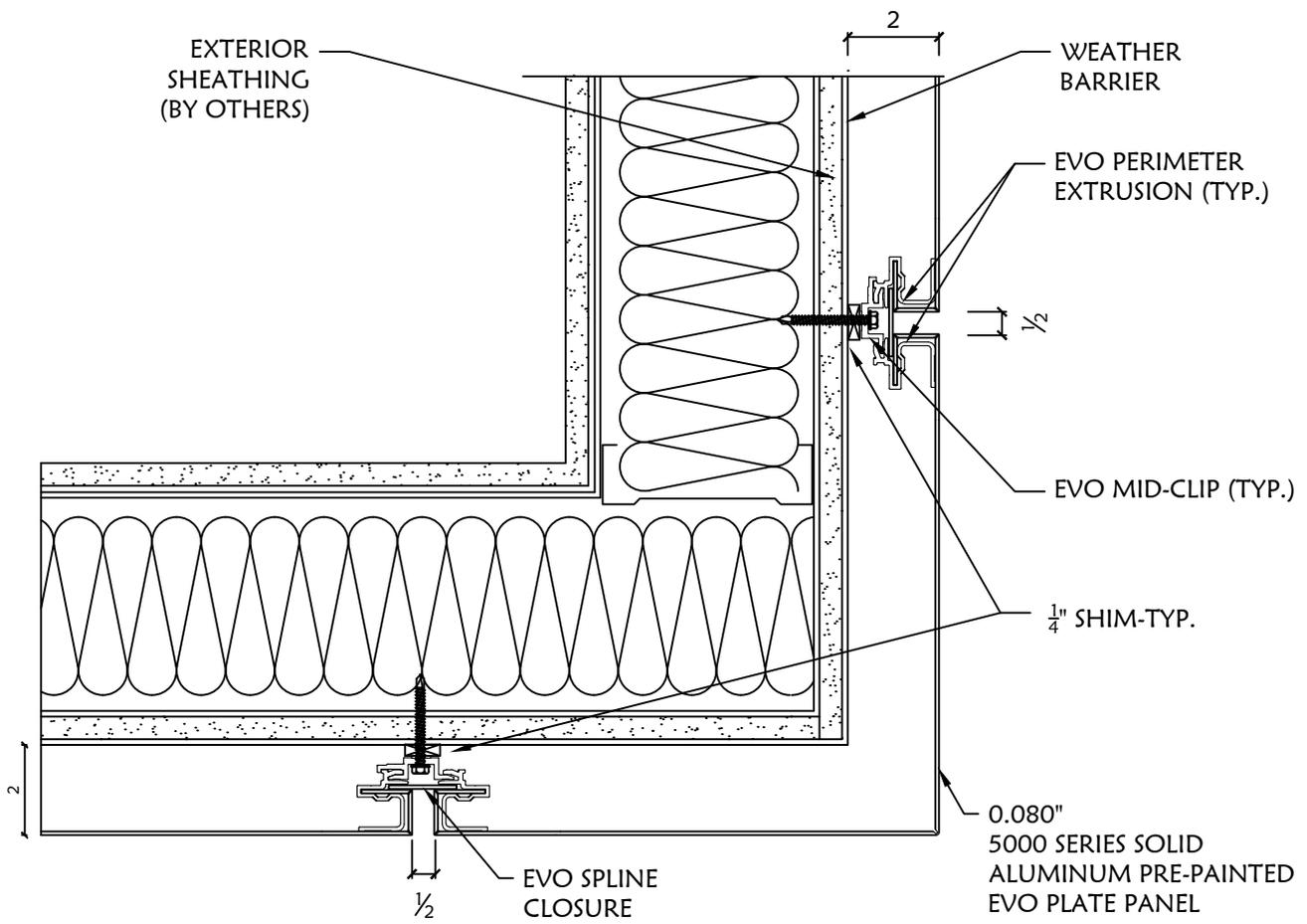
**EVO SYSTEM**®



INSIDE CORNER DETAIL

OC-07

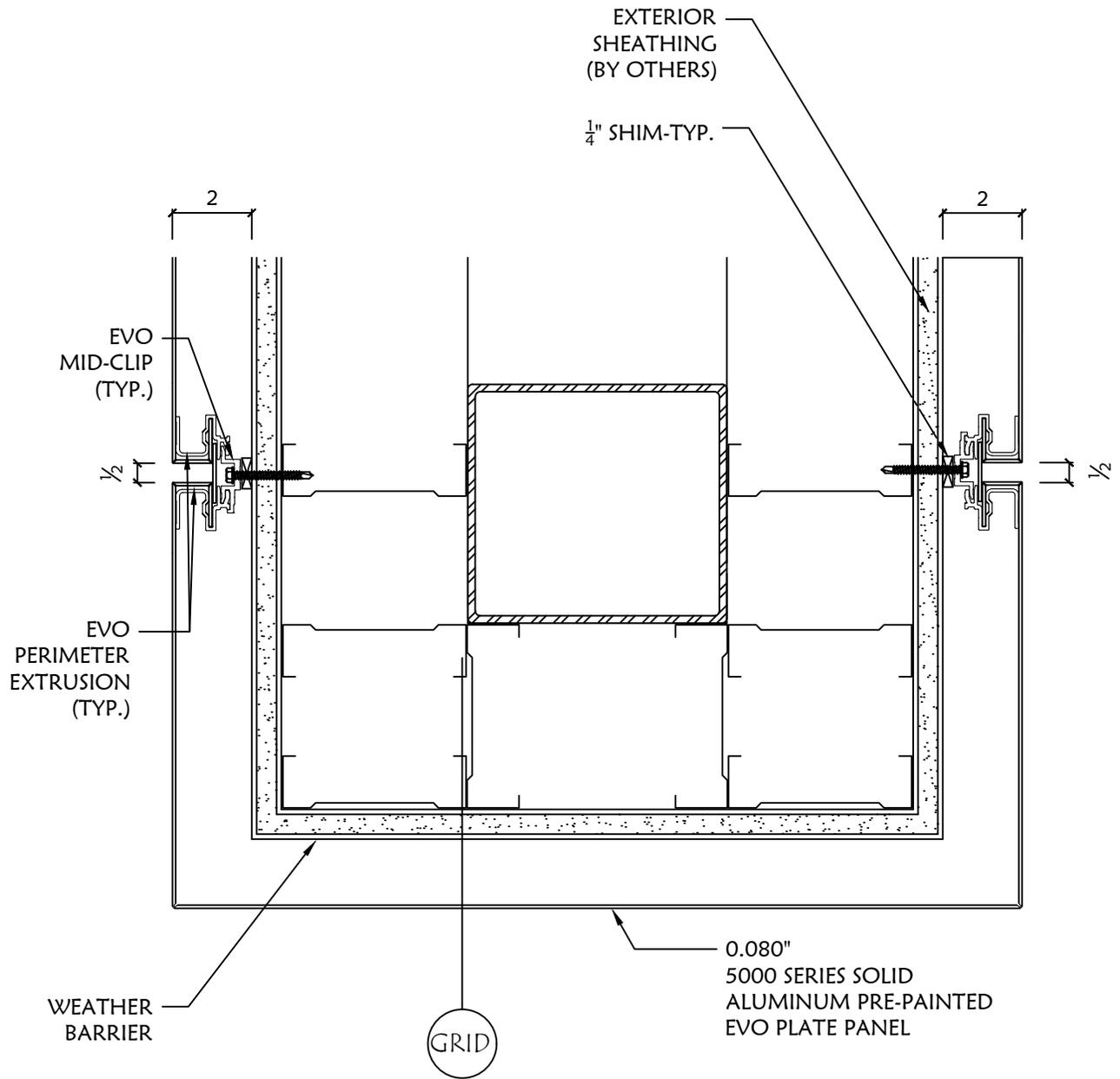
**EVO SYSTEM**®



OUTSIDE CORNER DETAIL

OC-08

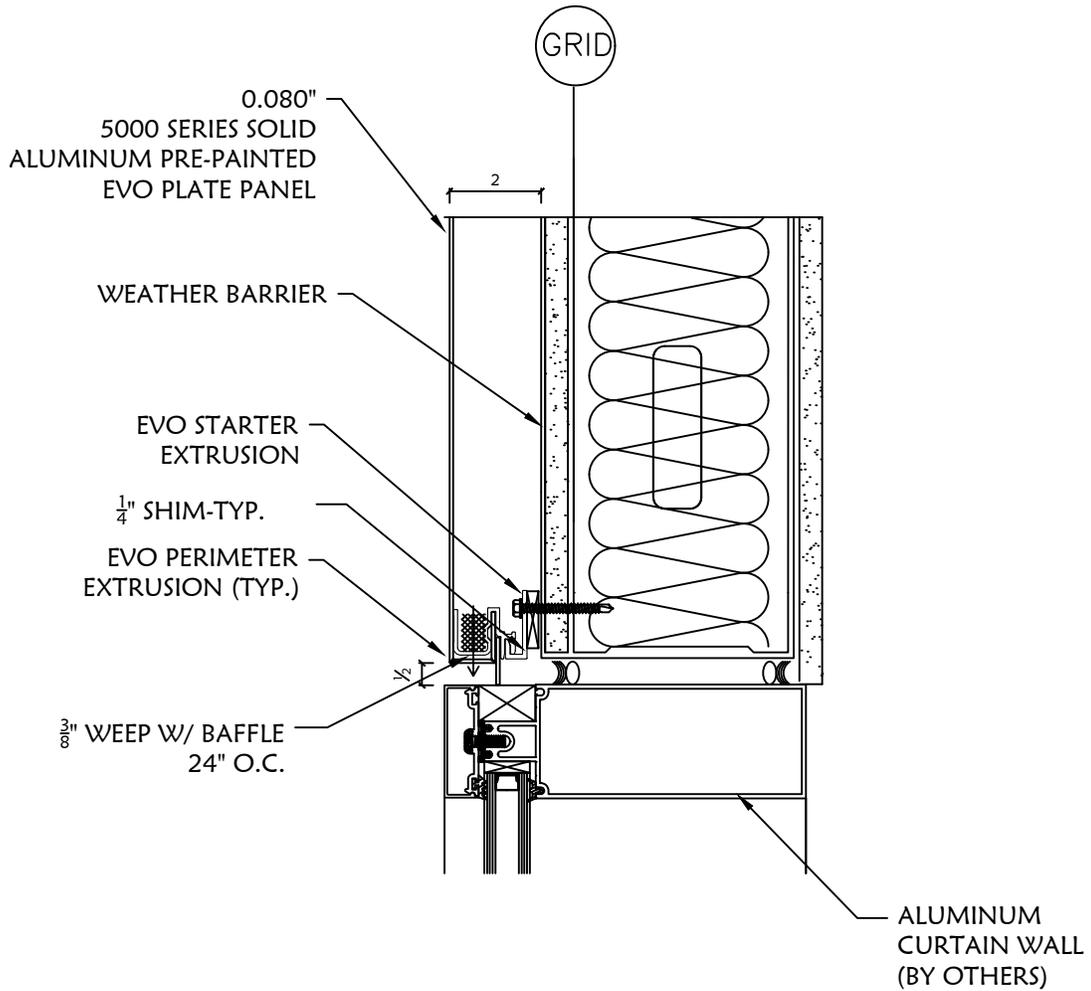
**EVO SYSTEM<sup>®</sup>**



SQUARE COLUMN DETAIL

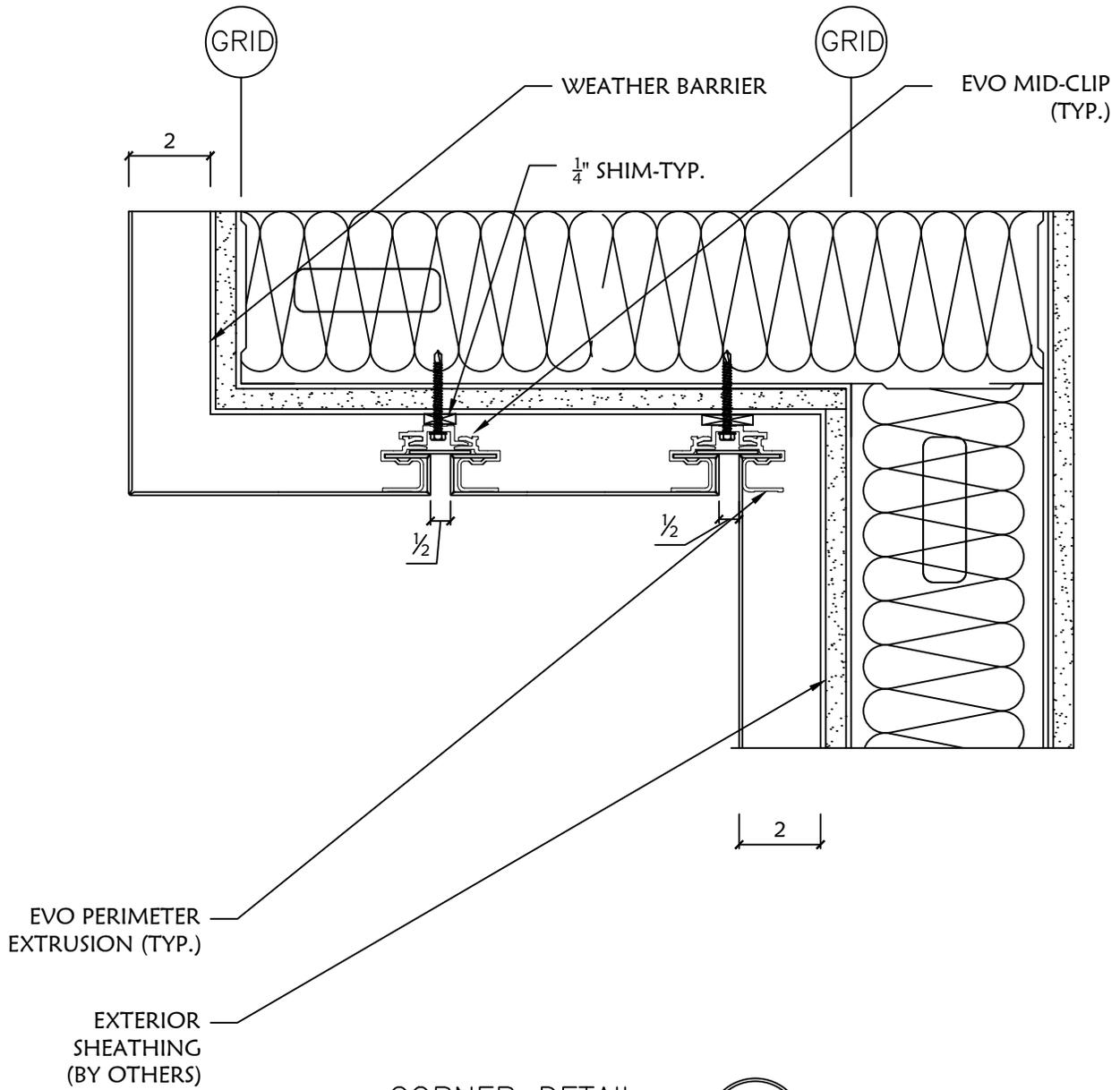
OC-09

# EVO SYSTEM®



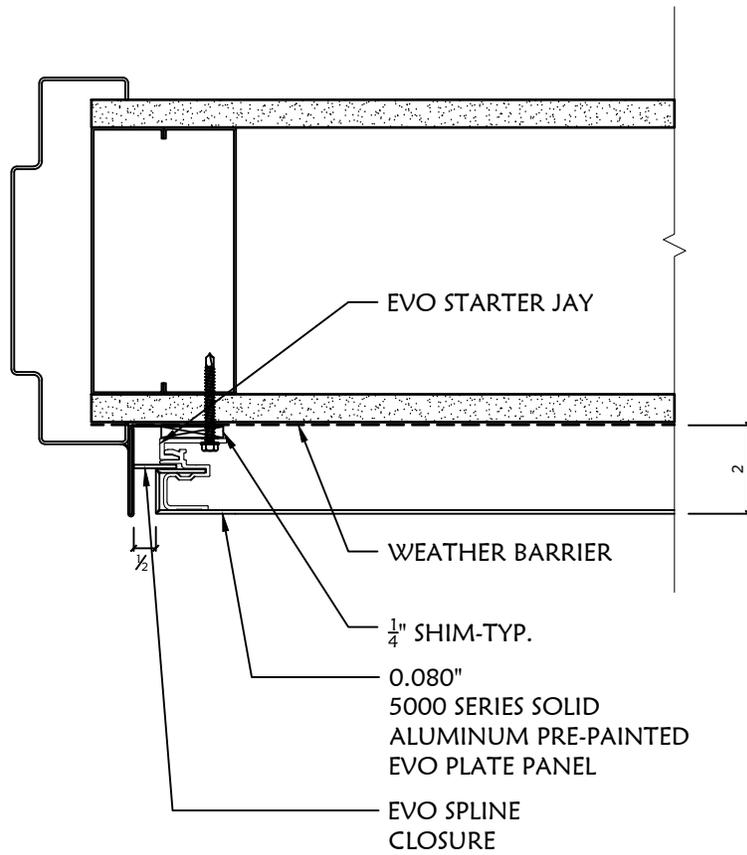
WINDOW HEAD DETAIL

**EVO SYSTEM<sup>®</sup>**



CORNER DETAIL

**EVO SYSTEM®**



HM JAMB DETAIL



## EVOPlate™ 2MM / 3MM Solid Alloy Panels

### 1. LIMITED WARRANTY

EVOPlate™ finishes will not Crack, Flake or Peel for Thirty-Five (35) YEARS; Chalk for Thirty-Five (35) YEARS or Change Color for Thirty-Five (35) YEARS.

\* EVOPlate™ is not covered by a corrosion warranty. \*

### 2. FINISHES

#### .1 COIL-COATED FINISHES

Details.

EVOPlate™ solid alloy 70/30 PVdF coatings are designed from the highest end materials for all architectural and CID projects. Certified for both Hylar® and Kynar® resins and matched with the most durable ceramic and inorganic pigments, they will exceed your expectations for Architectural coating performance. EVOplate's high quality coil coated finishes meets all AAMA 2605 test specifications and has outstanding weathering properties for use in the harshest conditions. EVOPlate™ finishes have been proven to stand the test of time after being exposed to extreme temperatures ranging from over 100 F in the summer to less than -40°F in the winter, and various exposure tests. EVOPlate™ standard color chart offers a wide variety of finishes that are not only attractive but durable to.

EVOPlate™ Coating Specifications.

- Pencil Hardness (ASTM D 3363<sup>1</sup>): F-H, Eagle Turquoise
- Gloss @ 60° (ASTM D 523): 15 to 40
- Solvent Resistance (ASTM D 5402): 100+ MEK double rubs
- Reverse Impact Resistance (ASTM D 2794<sup>2</sup>): 1.5 x metal thickness/no pick-off or cracking
- Flexibility/T-Bend (ASTM D 4145<sup>2</sup>): 2T no pick-off
- Metal Marking Resistance: Excellent

- Humidity Resistance (ASTM D 2247, ASTM D714): No blistering, loss of adhesion, or discoloration after 1500 hours exposure to 100% relative humidity
- Salt Spray Resistance (ASTM B 117, ASTM D714): None or few #8 blisters and no more than 1/16" creepage from a score line using 5% salt solution for 1500 hours
- South Florida Exposure: 20 years @ 45°, Less than 5.0 ΔE, Chalk rating of no less than 8
- QUV-A Accelerated Weathering (ASTM G154, ASTM D2244): Less than 3.0 ΔE, 70% gloss retention for 2000 hours

## .2 ANODIZED FINISHES

EVOplate™ Class I Anodizing is a thicker protective coating for aluminum, recommended for architectural use. The thicker coating is achieved by longer immersion time in the anodizing tank, which costs a bit more but the result for superior resistance to corrosion, scratching and fading. For dark colors, Class I gives a more matte appearance and better color. Standard grades of aluminum anodizing are compared below, Class I vs. the lesser Class II and Decorative:

<b>Anodizing Type Class I</b>
1. Thickness- <b>0.7 mil +</b>
2. Corrosion resistance/salt-spray testing- <b>3,000 hrs</b>
3. Typical uses- <b>Exterior Architectural Panels (Division 7)</b>
4. Protection from scratching- <b>Best Available</b>
5. Fade-resistant- <b>Yes</b>

## 3. BASE ALUMINUM MATERIAL

### .1 COIL COATED PVdF FINISHES 5052

#### Bending Radii

<b>Minimum Bend Radius for Sheet or Plate thickness "t"</b>								
<b>Temper</b>	<b>0.4mm</b>	<b>0.8mm</b>	<b>1.6mm</b>	<b>3.2mm</b>	<b>4.8mm</b>	<b>6.0mm</b>	<b>10mm</b>	<b>12mm</b>
O	0t	0t	0t	½ t	1t	1t	1½t	1½t
H32	0t	0t	1t	1½t	1½t	1½t	1½t	2t
H34	0t	1t	1½t	2t	2t	2½t	2½t	3t
H36	1t	1t	1½t	2½t	3t	3½t	4t	4½t
H38	1t	1½t	2½t	3t	4t	5t	5½t	6½t

Recommended minimum bending radius for sheet of thickness given, at 90° to the rolling direction. These values are recommended but are not guaranteed; the minimum possible bend radius will depend on the type of bending equipment and on the tooling and its condition.

**Composition Specification (%)** (single values are maxima except as noted)

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	
									Each	Total
5052	0.25	0.40	0.10	0.10	2.2-2.8	0.15-0.35	0.10	-	0.05	0.15

**Mechanical Property Specification** (single values are minima except as noted)

Alloy & Temper	Tensile Strength (MPa)	Yield Strength 0.2% Proof (MPa) min	Elongation (% in 50mm)				
			minimum for sheet or plate thicknesses shown				
			0.15-0.32mm	0.33-0.63mm	0.64-1.20mm	1.21-6.30mm	6.31-80.0mm
5052-O	170 - 215	65	13	15	17	19	18
5052-H32	215 - 265	160	-	4	5	7	11
5052-H34	235 - 285	180	3	3	4	6	10
5052-H36	255 - 305	200	2	3	4	4*	-
5052-H38	270 min	220	2	3	4	4*	-

Tempers H22 and H24 etc may not meet maximum tensile strength and minimum yield strength limits, but if supplied in place of ordered H32 or H34 all limits must be complied with.

\* properties for H36 only specified up to 4.0mm, and for H38 up to 3.2mm thick.

Specialist tempers such as F, H116, H112 and H141 are also possible in 5052 – refer to standards for details.

**Physical Properties**

(typical values)

Alloy	Density (kg/m <sup>3</sup> )	Elastic Modulus (GPa)	Mean Coefficient of Thermal Expansion 20-100°C (µm/m/°C)	Thermal Conductivity at 25°C (W/m.K)	Electrical Conductivity MS/m at 20°C		Electrical Resistivity (nΩ.m)
					Equal Volume	Equal Mass	

.2 CLASS 1 ANODIZED FINISHES 5005

**Bending Radii**

Minimum Bend Radius for Sheet or Plate thickness "t"								
Temper	0.4mm	0.8mm	1.6mm	3.2mm	4.8mm	6.0mm	10mm	12mm
O	0t	0t	0t	0t	½t	1t	1t	1½t
H32	0t	0t	0t	½t	1t	1t	1½t	2t
H34	0t	0t	0t	1t	1½t	1½t	2t	2½t
H36	½t	1t	1t	1½t	2½t	3t	3½t	4t
H38	1t	1½t	2t	2½t	3½t	4½t	5½t	6½t

Recommended minimum bending radius for sheet of thickness given, at 90° to the rolling direction. These values are recommended but are not guaranteed; the minimum possible bend radius will depend on the type of bending equipment and on the tooling and its condition.

**Composition Specification (%)** (single values are maxima except as noted)

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	
									Each	Total
5005	0.30	0.7	0.20	0.20	0.50-1.1	0.10	0.25	-	0.05	0.15

**Mechanical Property Specification** (single values are minima except as noted)

Alloy & Temper	Tensile Strength (MPa)	Yield Strength 0.2% Proof (MPa) min	Elongation (% in 50mm) minimum for sheet or plate thicknesses shown				
			0.15- 0.32mm	0.33- 0.63mm	0.64- 1.20mm	1.21- 6.30mm	6.31- 80.0mm
			5005-O	105 - 145	35	12	16
5005-H32	120 - 160	85	-	3	4	7	10 *
5005-H34	140 - 180	105	2	3	4	5	8 *
5005-H36	160 - 200	125	1	2	3	4 *	-
5005-H38	180 min	-	1	2	3	4 *	-

Tempers H22 and H24 etc may not meet maximum tensile strength and minimum yield strength limits, but if supplied in place of ordered H32 or H34 all limits must be complied with.

\* properties for H32 only specified up to 50mm, H34 to 25mm, H36 to 4.0mm and H38 to 3.2mm thick. Specialist tempers such as F, H116, H112 and H141 are also possible in 5052 – refer to standards for details.

**Physical Properties**

(typical values)

Alloy	Density (kg/m <sup>3</sup> )	Elastic Modulus (GPa)	Mean Coefficient of Thermal Expansion 20-100°C (µm/m/°C)	Thermal Conductivity at 25°C (W/m.K)	Electrical Conductivity MS/m at 20°C		Electrical Resistivity (nΩ.m)
					Equal Volume	Equal Mass	

4. LEED INFORMATION

EVOPlate™ 5000 series alloys consist of 40% pure aluminum ingot, 60% pre consumer content.

**EVOPlate™ is Distributed By:**

**Architectural Systems Group LLC  
221 E Willis Rd #18  
Chandler, AZ 85286**

**Email- [orders@asg-rep.com](mailto:orders@asg-rep.com)  
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W: www.exova.com



Testing. Advising. Assuring.

**PERFORMANCE EVALUATION OF THE  
“EVOPLATE™ NON-COMBUSTIBLE RAINSCREEN SYSTEM”  
IN ACCORDANCE WITH AAMA 508-14 FOR  
VOLUNTARY TEST METHOD AND SPECIFICATION FOR  
PRESSURE EQUALIZED RAIN SCREEN WALL CLADDING SYSTEMS**

Report to:

**Carter Architectural Panels Inc.  
(Carter Fabricating Inc.)**  
326 Deerhurst Drive  
Brampton, Ontario, Canada  
L6T 5H9

Attention:

Mr. Joel McKinley

Telephone:  
Cell:  
E-mail:  
CC:

905-487-1684  
480-828-9648  
JMcKinley@Carterpanels.com  
BBourne@Carterpanels.com

New Report No.  
Proposal No.:

18-06-B0193-F1, Revision 3  
18-006-570736  
11 Pages, 1 Appendix

Report Date:

March 28, 2019

**1.0 INTRODUCTION**

Exova was retained to evaluate the "EVOPLATE™ Non-Combustible Rainscreen Systems" exterior wall panel system in accordance with AAMA 508-14 for voluntary test method and specification for pressure equalized rain screen wall cladding systems as outlined in Proposal number 18-006-570736.

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

**Client Specimen Description**

EVOPLATE™ Non-Combustible Rainscreen System  
 (T-Panel Scheme / 3 panels, not individually pressure isolated)

**Exova Specimen No.**

18-06-B0193-1

**2.0 PROCEDURE**

Test Description	Test Method
Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems - Air Leakage Quantification	AAMA 508-14, Section 5.3 – Referencing ASTM E283-04 (2012)
Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems - Pressure Equalization	AAMA 508-14, Section 5.5 – Referencing ASTM E1233-14
Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems - Water Penetration via Static Pressure	AAMA 508-14, Section 5.6 – Referencing ASTM E331-00 (2016)
Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems - Dynamic Water Penetration	AAMA 508-14, Section 5.7 – Referencing AAMA 501.1-17, Dynamic Water
Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems - Structural Performance	AAMA 508-14, Section 5.8 – Referencing ASTM E330-14 (2014)

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 Exova test frame as per the detail drawing below in accordance with AAMA 508-14, Section 5.0.

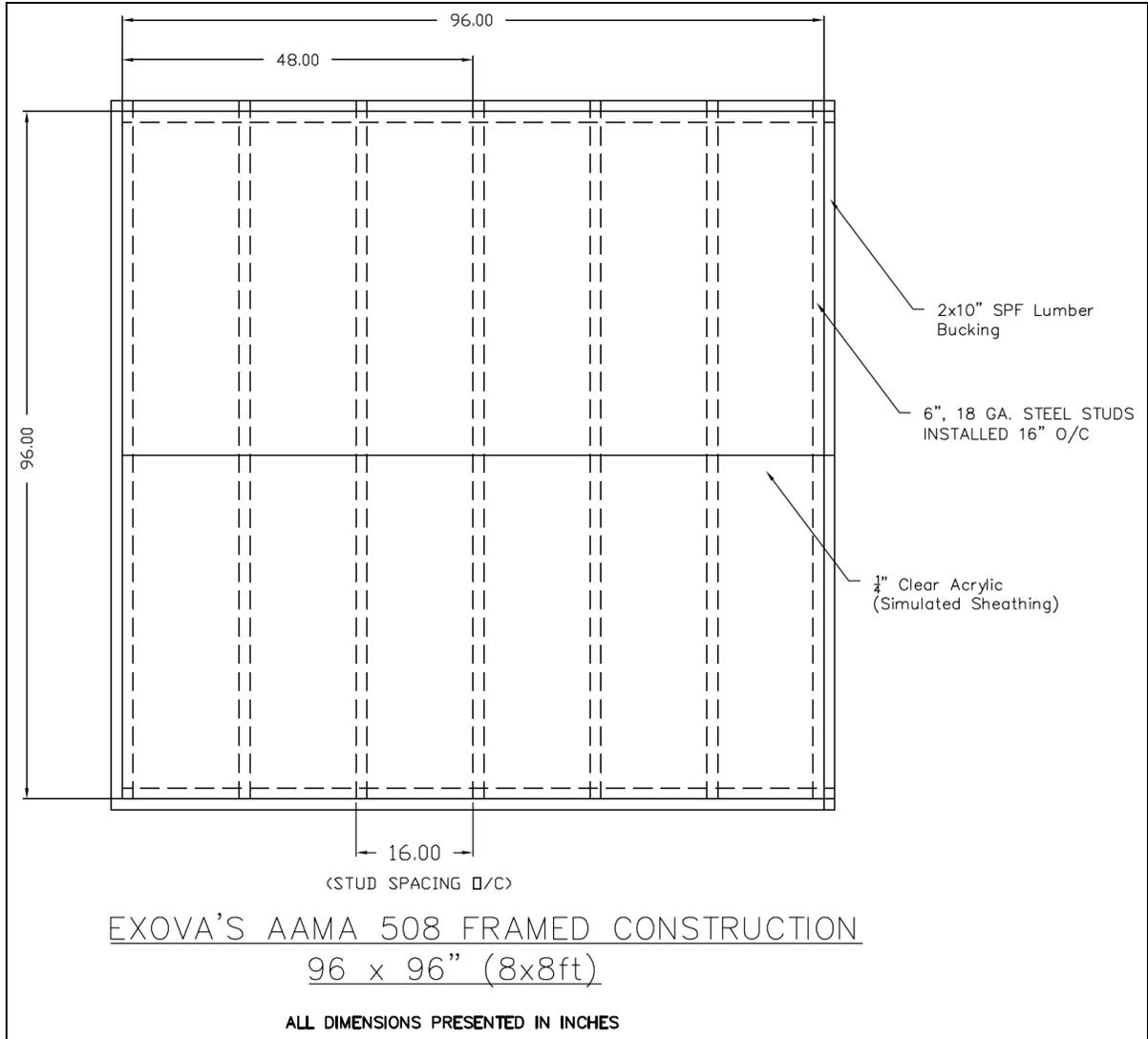


Figure 1 – Back-up Test Wall Framing Construction

**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. After the air leakage validation for tightness was completed, as prescribed by AAMA 508-14, Section 5.2.2 & Figure 1A, three (3) mm (1/8") diameter holes were introduced equally spaced 150 mm (5.91") above horizontal seams and above the base of the mock-up in order for the air / water barrier to have an air leakage rate of 0.6 L/s·m<sup>2</sup> (+/- 10%).

The application of the cladding system on the test back-up wall was performed by Carter Fabricating Inc. authorized personnel on November 9, 2018. As permitted by AAMA 508-14, 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.

Using the procedure outlined in AAMA 508-14, Section 5.5, the pressure cycling tests were conducted as specified in ASTM E1233 to a positive pressure from 240 Pa (5.0 PSF) to 1200 Pa (25.06 PSF) to 240 Pa (5.0 PSF) based on a maximum average of three seconds for 100 cycles as per AAMA 508-14. Upon completion of the pressure equalization behavior test, the AAMA 508-14, Section 5.6, water penetration test at 300 Pa (6.24 PSF) for fifteen minutes was conducted.

Upon completion of the static water penetration test as outlined in AAMA 508-14, Section 5.6, testing was conducted in accordance with AAMA 508-14, Section 5.7 referencing AAMA 501.1-17 at 300 Pa (6.24 PSF).

**3.0 RESULTS**

<b>Table 1 – Custom Air Leakage Results per Client Request <sup>(1)</sup></b> <b>ASTM E283-04 (2012)</b> <b>Exova Specimen No.: 18-06-B0193-1 (Test Date: November 12, 2018)</b>		
Test Pressure Differential (Pa)	Infiltration	Exfiltration
75 Pa (1.57 PSF)	0.01 L/s m <sup>2</sup> (0.003 CFM/ft <sup>2</sup> ) <sup>(1)</sup>	0.01 L/s m <sup>2</sup> (0.003 CFM/ft <sup>2</sup> ) <sup>(1)</sup>
300 Pa (6.24 PSF)	0.02 L/s m <sup>2</sup> (0.003 CFM/ft <sup>2</sup> ) <sup>(1)</sup>	0.02 L/s m <sup>2</sup> (0.003 CFM/ft <sup>2</sup> ) <sup>(1)</sup>

<sup>(1)</sup> As per client request, the assembly was initially tested with an uncompromised simulated air-tight air / water resistive barrier on sheathing (*Plexiglas sheathing intact / as delivered to Exova*). The air-tight Plexiglas substrate was employed to simulate an air / water resistive barrier sheathing membrane in conjunction with the rainscreen system attached through the Plexiglas to the interior supporting studs.

<b>Table 2 – AAMA 508-14, Section 5.3,</b> <b>Referencing ASTM E283-04 (2012) Summarized Air Leakage Results <sup>(2)</sup></b> <b>Exova Specimen No.: 18-06-B0193-1 (Test Date: November 12, 2018)</b>	
Test Pressure Differential (Pa)	Infiltration
75 Pa (1.57 PSF)	0.55 L/s m <sup>2</sup> (0.110 CFM/ft <sup>2</sup> ) <sup>(2)</sup>

<sup>(2)</sup> Forty-eight (48) 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 508-14, Section 5.2.2.

3.0 RESULTS (CONTIUNED)

Table 3 – AAMA 508-14, Section 5.5, Referencing ASTM E1233-14 Pressure Equalization Behavior Analysis Exova Specimen No.: 18-06-B0193-1 (Test Date: November 12, 2018)					
Compartment Tested	Maximum External Gust Pressure of Pulse	Maximum Cavity Pressure of Pulse	Requirements		Comments
			Pressure Differential	Maximum Time Shift of Pulse	
Primary Compartment	1178 Pa (24.60 PSF)	972 Pa (20.30 PSF)	Pressure differential on rain screen cladding shall not exceed 50% of maximum wind gust pressure	< 0.08 seconds	Meets Requirement

- Air Leakage of Back-Up Wall (air / water barrier): **0.55 L/s m<sup>2</sup>** (0.11 CFM/ft<sup>2</sup>)
- Ratio of cavity volume to vent area (Upper Panels): **636 m<sup>3</sup> / m<sup>2</sup>**
- Ratio of cavity volume to vent area (Lower Panel): **763 m<sup>3</sup> / m<sup>2</sup>**

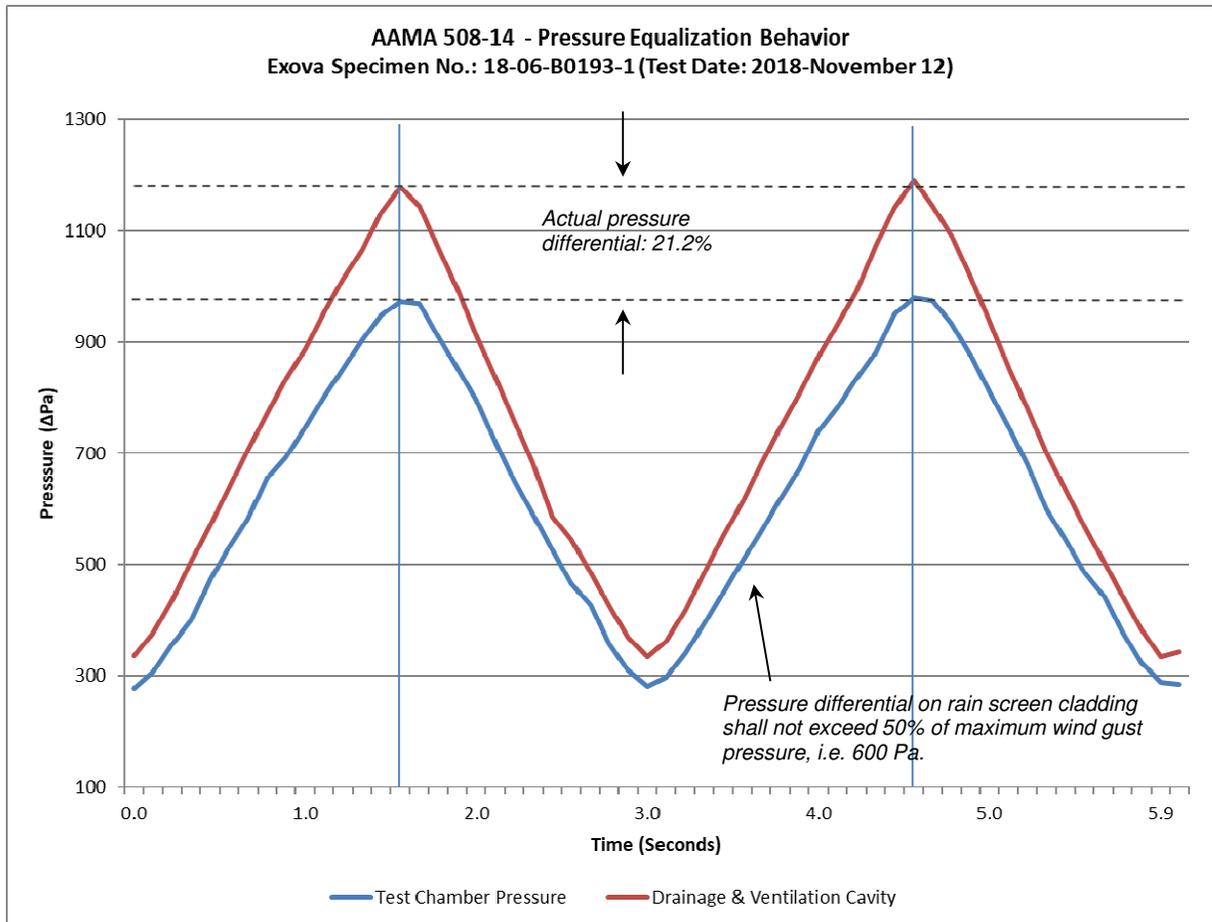


Figure 2 – Pressure Equalization Behavior

**3.0 RESULTS (CONTIUNED)**

<b>Table 4 – AAMA 508-14, Section 5.6, Referencing ASTM E331-14                      Water Penetration Resistance                      Exova Specimen Number: 18-06-B0193-1 (Test Date: November 13, 2018)</b>			
<b>Test Pressure (Pa)</b>	<b>Requirements</b>	<b>Results</b>	<b>Comments</b>
300 Pa <sup>(2)</sup> (6.24 PSF)  (15-Minutes)	<p>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:</p> <p>a) Water mist or droplets on the air/water barrier surface; and/or</p> <p>b) Water in continuous stream on the air/water barrier surface.</p> <p>Failure shall be defined as water mist or water droplets appearing in excess of 5% of the air/water barrier surface, or continuous streaming at any location on the air/water barrier.</p>	<p>Water mist and/or droplets were observed. No continuous streaming was observed.</p> <p>3.7 % of air/water barrier surface area had water misting and / or water droplets.</p>	<p><b>Meets Requirement</b></p>

<sup>(2)</sup> 300 Pa = 22.1 m/s (or 50 mph / 80.5 km/h). Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ , V is m/s & P is N/m<sup>2</sup>

**3.0 RESULTS (CONTIUNED)**

<b>Table 5 – AAMA 508-14, Section 5.7, Referencing AAMA 501.1-17                      Dynamic Water Penetration test                      Exova Specimen Number: 18-06-B0193-1 (Test Date: November 14, 2018)</b>			
Test Pressure (Pa)	Requirements	Test Results	Comment
300 Pa <sup>(2)</sup> (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.  Failure shall be defined as water mist or water droplets appearing in excess of 5% of the air/water barrier surface, or continuous streaming at any location on the air/water barrier.	Water mist and/or droplets were observed.  4.9 % of air/water barrier surface area had water misting and / or water droplets.  All water that penetrated the exterior rain screen cladding was controlled and drained to the exterior with no continuous streaming observed.	<p align="center"><b>Meets Requirements</b></p>

<sup>(2)</sup> 300 Pa = 22.1 m/s (or 50 mph / 80.5 km/h). Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ , V is m/s & P is N/m<sup>2</sup>

**Outdoor Conditions during Test:**

Temperature: 3.2 °C  
 Relative Humidity: 42 %RH  
 Barometric Pressure: 29.8 inHg



Figure 3 – AAMA 501.1, Dynamic Water Penetration Test

3.0 RESULTS (CONTIUNED)

Table 6 – AAMA 508-14, Section 5.8, Referencing ASTM E330-14 (2014) Static Structural Performance (Preload and Design Pressure) <sup>(2)</sup> Exova Specimen Number: 18-06-B0193-1 (January 16, 2019)			
Test	Requirements	Test Results	Comment
Static Structural Performance (Section 5.8)	<b>ASTM E330-14</b> Preload (0.5 x Design Pressure)  +/- 1,795 Pa (37.5 PSF)  <b>Requirements:</b> - No permanent damage-	No Permanent Damage Observed	No visual damage or buckling observed
	<b>ASTM E330-14</b> Design Pressure  +/- 3,591 Pa (75.0 PSF) <sup>(1)</sup>  <b>Requirements:</b> - Report Support Wall Deflection	Stud Length (L) = 2,438 mm (96.0 inches) Allowable (L/180) = 13.54 mm (0.533 inches)  <b>Vertical Net Deflection at Design Pressure:</b>  + 3,591 Pa (75.0 PSF) = -2.04 mm (0.08 inches)  - 3,591 Pa (75.0 PSF) = 0.60 mm (0.02 inches)  <b>Horizontal Net Deflection at Design Pressure:</b>  + 3,591 Pa (75.0 PSF) = -1.87 mm (0.07 inches)  - 3,591 Pa (75.0 PSF) = 3.53 mm (0.14 inches)  - No Permanent Damage Observed	<b>Meets Requirements</b>  L/180

<sup>(1)</sup> 3,591 Pa = 76.6 m/s (or 171 mph / 275 km/h). Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ , V is m/s & P is N/m<sup>2</sup>

<sup>(2)</sup> AAMA 508-14, Section 5.8 states: "When testing the actual air/water barrier for a project specific system, perform static structural performance test ASTM E330 at 0.5, 1.0 and 1.5 times the specified positive and negative design pressures." As the testing outlined in this report was not for a project specific system, a design pressure was not outlined. However, Exova performed structural testing of the AAMA 508-14 system in accordance with ASTM E330-14 with an assumption Design Pressure of ±3,591 Pa (171 mph / 275 km/h) for informational purposes.

3.0 RESULTS (CONTIUNED)

Table 7 – AAMA 508-14, Section 5.8, Referencing ASTM E330-14 (2014) Static Structural Performance (Structural Pressure) <sup>(4)</sup> Exova Specimen Number: 18-06-B0193-1 (January 16, 2019)			
Test	Requirements	Test Results	Comment
<b>Static Structural Performance</b> (Section 5.8)	<p style="text-align: center;"><b>ASTM E330-14</b></p> Structural Test Pressure (1.5 x Design Pressure) +/- 5,386 Pa (112.5 PSF) <sup>(3)</sup> <p><b>Requirements:</b></p> <ul style="list-style-type: none"> <li>- No permanent damage</li> <li>- Report Support Wall Deflection</li> </ul>	<p><b>Vertical Net Deflection at Design Pressure:</b></p> + 5,386 Pa (112.5 PSF) = -0.44 mm (0.02 inches) <p style="text-align: center;"><i>Residual Deflection</i></p> -0.64 mm (0.03 inches)                     - 5,386 Pa (112.5 PSF) = 1.36 mm (0.05 inches) <p style="text-align: center;"><i>Residual Deflection</i></p> 0.25 mm (0.01 inches) <p><b>Horizontal Net Deflection at Design Pressure:</b></p> + 5,386 Pa (112.5 PSF) = -1.24 mm (0.05 inches) <p style="text-align: center;"><i>Residual Deflection</i></p> -0.64 mm (0.03 inches)                     - 5,386 Pa (112.5 PSF) = 1.44 mm (0.06 inches) <p style="text-align: center;"><i>Residual Deflection</i></p> 1.42 mm (0.06 inches) <p>- No Permanent Damage Observed</p>	<p style="text-align: center;"><b>No Permanent Damage Observed</b></p>

<sup>(3)</sup> 5,386 Pa = 93.7 m/s (or 209 mph / 337 km/h). Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ , V is m/s & P is N/m<sup>2</sup>

<sup>(4)</sup> AAMA 508-14, Section 5.8 states: "When testing the actual air/water barrier for a project specific system, perform static structural performance test ASTM E330 at 0.5, 1.0 and 1.5 times the specified positive and negative design pressures." As the testing outlined in this report was not for a project specific system, a design pressure was not outlined. However, Exova performed structural testing of the AAMA 508-14 system in accordance with ASTM E330-14 with an assumption Design Pressure of ±5,386 Pa (209 mph / 337 km/h) for informational purposes.

3.0 RESULTS (CONTIUNED)

Table 8 – Client Specific (Requested) Testing Test to Failure in the Negative Wind Load Direction ASTM E330-14 – SI & IP Units Static Structural Performance Exova Specimen Number: 18-06-B0193-1 (January 16, 2019)	
Maximum Pressure Achieved	Comments
8,349 Pa <sup>(3)</sup>	Cladding System did not disengage from wall assembly. However, vertical supporting steel studs buckled in the center
174 lbs. /ft <sup>2</sup>	

<sup>(3)</sup> 8,349 Pa = 116.7 m/s (or 261 mph / 420 km/h). Load  
 Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ ,  $V$  is m/s &  $P$  is N/m<sup>2</sup>

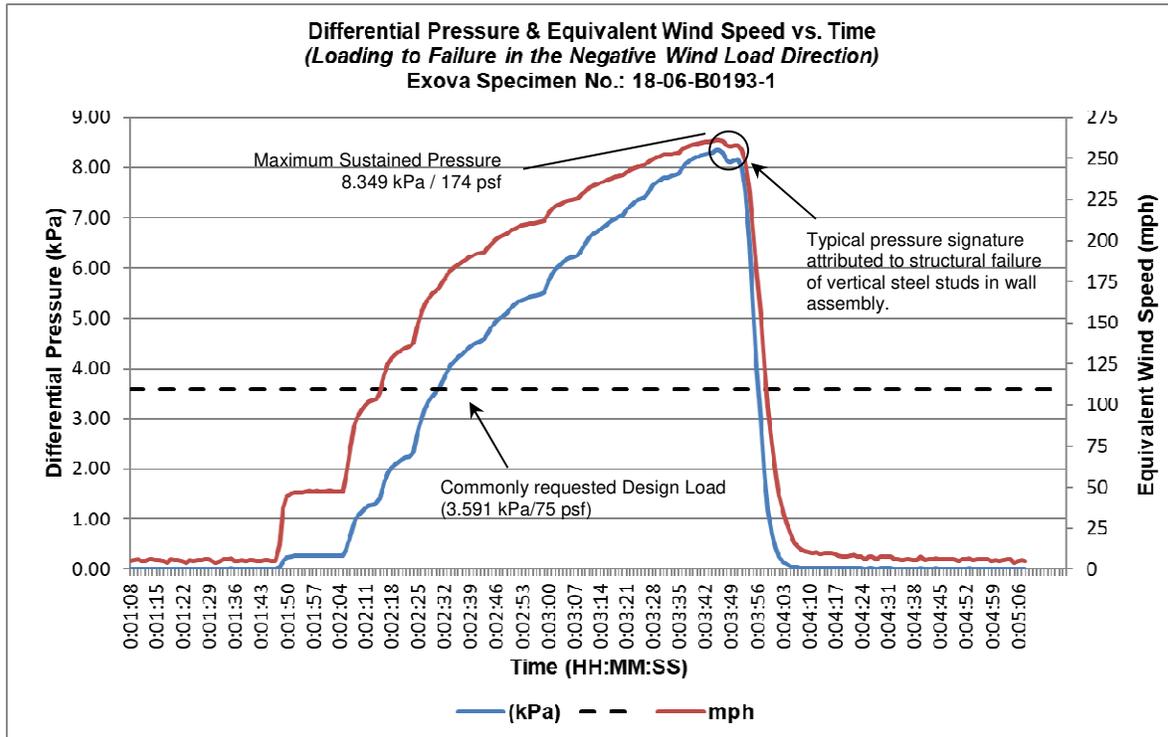


Figure 4 – Differential Pressure & Equivalent Wind Speed vs. Time (during testing to failure)

\*Note: Design loads are building and location specific. Please refer to architect or design engineer for specific building load requirements.

#### 4.0 SYSTEM MODIFICATIONS

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

#### 5.0 DISCUSSION

The Carter Architectural Panels Inc., "EVOPLATE™ Non-Combustible Rainscreen" (*Exova Specimen No.: 18-06-B0193-1*) identified in this report met the requirements of AAMA 508-14 for cavity pressure differential, time shift of pulse and water penetration.

The system has a cavity volume to vent area ratio of **636 m<sup>3</sup> / m<sup>2</sup>** (2,087 ft<sup>3</sup>/ft<sup>2</sup>) on the upper panels and **763 m<sup>3</sup> / m<sup>2</sup>** (2,503 ft<sup>3</sup>/ft<sup>2</sup>) on the lower panels with a total of eight (8) 0.375" diameter vent holes.

This report is not indented as a comprehensive evaluation of the system regarding performance and application to specific buildings.

#### 6.0 REVISION HISTORY

<b><u>Report No:</u></b>	<b><u>Date:</u></b>	<b><u>Description of Revisions:</u></b>
18-06-B0193-F1	2019-01-16	Original Document
18-06-B0193-F1, Revision 1	2019-01-31	Editorial changes to test graph and pressure vs. wind speed commentary.
18-06-B0193-F1, Revision 2	2019-03-05	Correction was made to Specimen identification And client updated detail drawings and B.O.M.
18-06-B0193-F1, Revision 3	2019-03-28	Correction was made to cavity volume to vent area ratio

***Reviewed by:***



Allan Lawrence, Ext. 11212  
Supervisor, Building Systems  
Products Division

***Reported & Authorized by:***



Sunny Ling, C.E.T, Ext. 11412  
Assistant Operations Manager, Building Science  
Technical Manager, Building Systems  
Products Division

**APPENDIX A**

Specimen Bill of Materials and Drawings

(5 Pages)

### 2mm EVOPlate Testing Bill of Materials

#### Framework:

6 pcs 1.5" x 1.5" x 2" x 1.5" x 1.5" Pre-punched Top Hat 18 Gauge G-90 Galvanized profile

4 pcs 2" x 1.5" x 2" Pre-punched U-channel 18 Gauge G-90 Galvanized profile

100 pcs #12 x 1.5" self-drilling screws

#### Panel Assemblies

1 pc 47" X 94.5625" 2MM EVOPlate EVO Panel assembly

2 pcs Patented EVO 2mm perimeter extrusion square cut @ 43.75" 6061-T6

2 pcs Patented EVO 2mm perimeter extrusion square cut @ 91.375" 6061-T6

4 pcs EVO 2mm 60 Durometer High Temp Silicon Corner blocks

14 pcs EVO Aluminum Corner reinforcement bracket 3003 Alloy

2mm EVOPlate coil coated 5052-H32 solid aluminum skin

30 EVO Torxalig zinc coated screws

5 pcs Patented EVO Integrated stiffener square cut to 43.5" 6061-T6

2 tubes of Dymonic FC adhesive

5 pcs 1" x .5" bug screen to cover weep holes

1 pc 47" X 47" 2MM EVOPlate EVO Panel assembly (2 assemblies used in test)

4 pcs Patented EVO 2mm perimeter extrusion square cut @ 43.75" 6061-T6

4 pcs EVO 2mm 60 Durometer High Temp Silicon Corner block

8 pcs EVO Aluminum Corner reinforcement bracket 3003 Alloy

2mm EVOPlate coil coated 5052-H32 solid aluminum skin

16 EVO Torxalig zinc coated screws

2 pcs Patented EVO Integrated stiffener square cut to 43.5" 6061-T6

.5 tube of Dymonic FC adhesive

3 pcs 1" x .5" bug screen to cover weep holes

#### Wall assembly

1 pc Patented EVO Starter Strip 6061-T6 profile square cut to 94"

15 pc Patented EVO Mid-Clip 6061-T6 profile square cut to 3" with pre-punched slot (Mounted on 16" maximum centre distance)

20 pc Patented EVO Half-Clip 6061-T6 profile square cut to 3" with pre-punched slot (Mounted on 16" maximum centre distance)

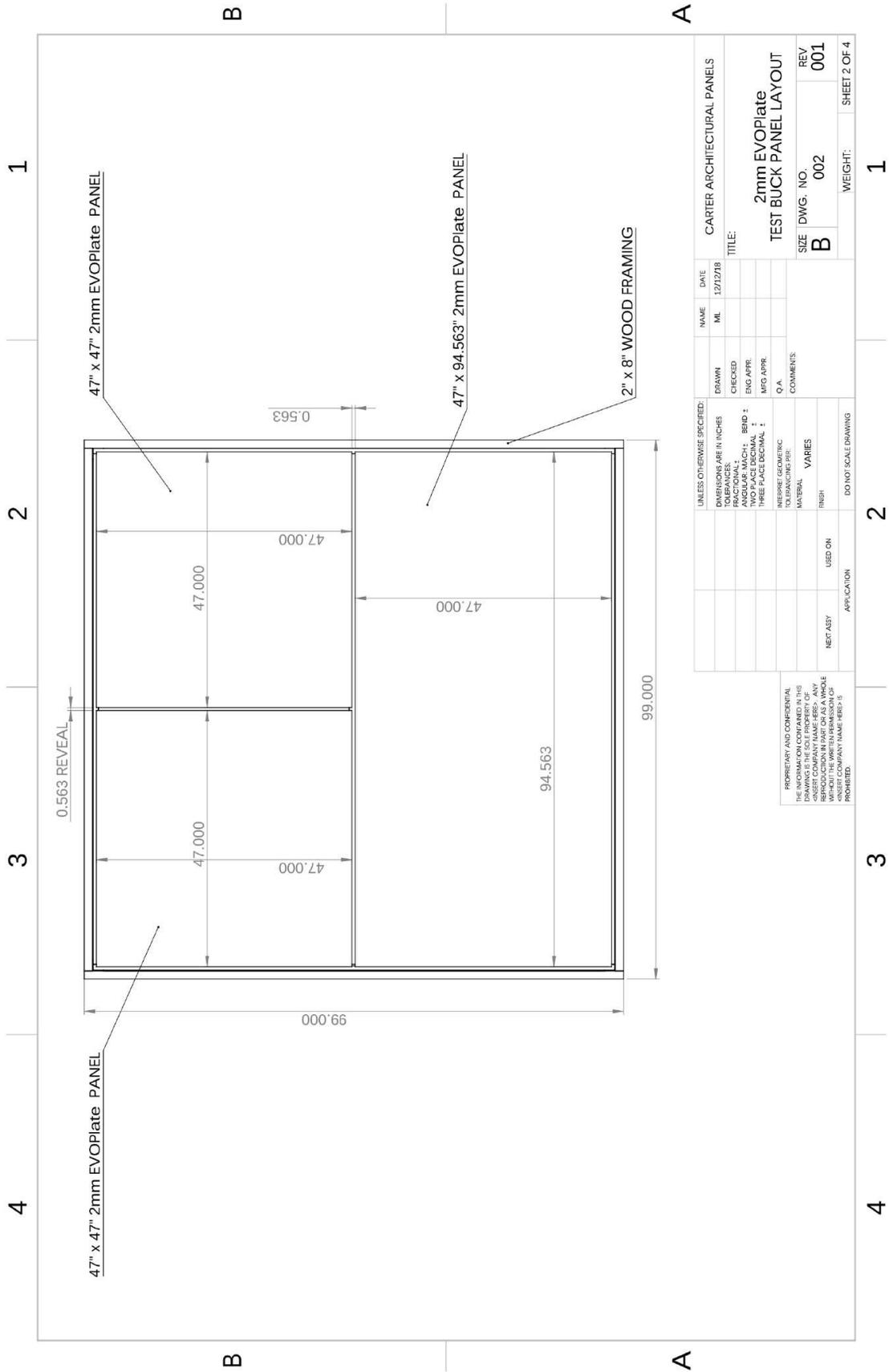
1 pc 2mm EVOPlate solid aluminum plate cut to 2" wide x 95" long (Horizontal Centre)

2 pc 2mm EVOPlate solid aluminum plate cut to 1.25" wide x 95" long (Top and bottom)

2 pc 2mm EVOPlate solid aluminum plate cut to 1.25" wide x 94" long (Sides)

1 pc 2mm EVOPlate solid aluminum plate cut to 47" (Vertical centre)

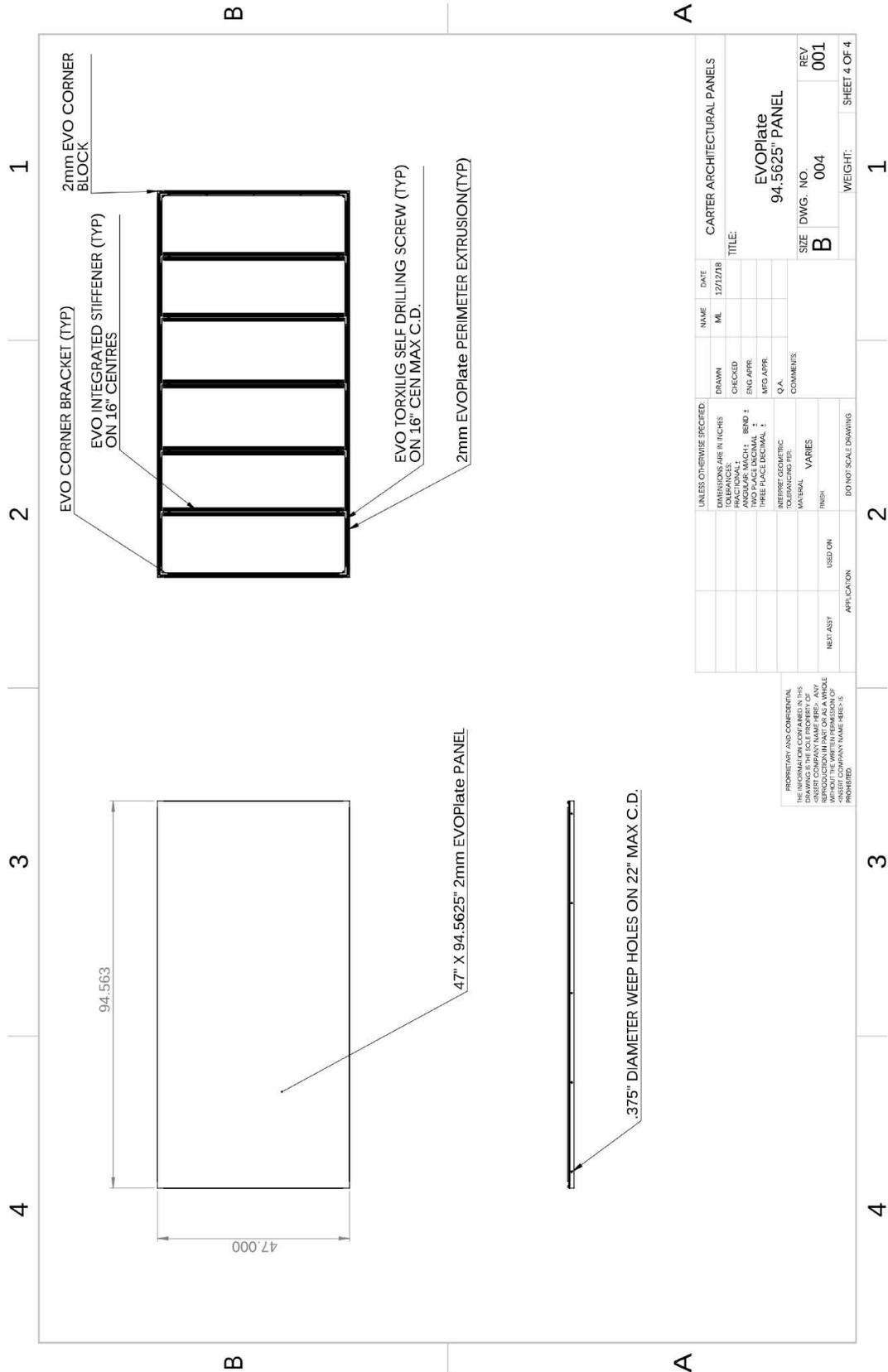




UNLESS OTHERWISE SPECIFIED:		NAME	DATE	CARTER ARCHITECTURAL PANELS	
DIMENSIONS ARE IN INCHES	DRAWN	ML	12/12/18	TITLE:	
FRACTIONAL	CHECKED			2mm EVOplate	
ANGULAR MATCH - BEHD 1	ENG APPR			TEST BUCK PANEL LAYOUT	
THREE PLACE DECIMAL	MFG APPR			SIZE	DWG. NO.
WELDING DIMENSIONS TO BRACKETS PER	Q.A.			B	002
MATERIAL	COMMENTS			REV	001
FINISH				WEIGHT:	SHEET 2 OF 4
DO NOT SCALE DRAWING	APPLICATION				
NET ASSY	USED ON				

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	CARTER ARCHITECTURAL PANELS	
DIMENSIONS ARE IN INCHES	FRAC TIONAL	ML	12/22/18	TITLE:	
ANGULAR MATCH	BEND :			EVOPlate	
THREE PLACE DECIMAL				94.5625" PANEL	
TOLERANCING PER:				SIZE DWG. NO.	REV
				B	004
					001
					WEIGHT:
					SHEET 4 OF 4

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Testing. Advising. Assuring.

**PERFORMANCE EVALUATION OF THE  
“EVOPLATE™ NON-COMBUSTIBLE RAINSCREEN SYSTEM”  
WALL ASSEMBLY  
FOR AIR INFILTRATION, WATER PENETRATION AND STRUCTURAL PERFORMANCE**

Report to:	<b>Carter Architectural Panels Inc. (Carter Fabricating Inc.)</b> 326 Deerhurst Drive Brampton, Ontario, Canada L6T 5H9
Attention:	Mr. Joel McKinley
Telephone:	905-487-1684
Cell:	480-828-9648
E-mail:	JMcKinley@Carterpanels.com
CC:	BBourne@Carterpanels.com
New Report No.	18-06-B0193-F3
Proposal No.:	18-006-570736 9 Pages, 1 Appendix
Report Date:	March 16, 2019

## 1.0 INTRODUCTION

Exova was retained to evaluate the "EVOPLATE™ Non-Combustible Rainscreen Systems" exterior wall panel system in accordance with ASTM E283, E331 and E330 as outlined in Proposal number 18-006-570736.

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

<b><u>Client Specimen Description</u></b> EVOPLATE™ Non-Combustible Rainscreen System (T-Panel Scheme / 3 panels, not individually pressure isolated)	<b><u>Exova Specimen No.</u></b> 18-06-B0193-1
---	---

### **Test Backup Wall Description:**

8 ft. x 8 ft Opaque wall comprising of one vertical sheathing joint (with joint sealed)

Frame Construction: 6" Steel Z-Bar (vertical), 16 ga / 16" O/C  
 2" Steel Z Bar (horizontal), 16 ga / 16" O/C

Sheathing: 1/4" thick Plexiglas (simulating exterior gypsum sheathing with installed air-tight air barrier / water resistive barrier). Note: Clear Plexiglas (simulated sheathing panels) were required for the observation of water penetration (ASTM E331).

## 2.0 PROCEDURE

Test Method	Test Description
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)	Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference
ASTM E330-14 (	Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference (Modified)

Note: SI units are the primary units of measure.

### **Configuration No. 1:**

The assembly was tested with an uncompromised simulated air-tight air / water resistive barrier on sheathing (Plexiglas sheathing intact / as delivered to Exova). The air-tight Plexiglas substrate was employed to simulate an air / water resistive barrier sheathing membrane in conjunction with the rainscreen system attached through the Plexiglas to the interior supporting studs.

### **Configuration No. 2:**

The assembly was tested with a compromised air / water resistive barrier (simulation of a poorly installed air / water resistive barrier by drilling 1/8" diameter holes through the Plexiglas) in accordance with AAMA 508-14 to induce an air leakage of 0.6 L/s.m<sup>2</sup> @ 75 Pa through the Plexiglas sheathing.

## 2.0 PROCEDURE (CONTINUED)

### Test Wall Section Description & Details:

The back-up test wall section (air / water barrier) was constructed in an Exova test frame as per the detail drawing.

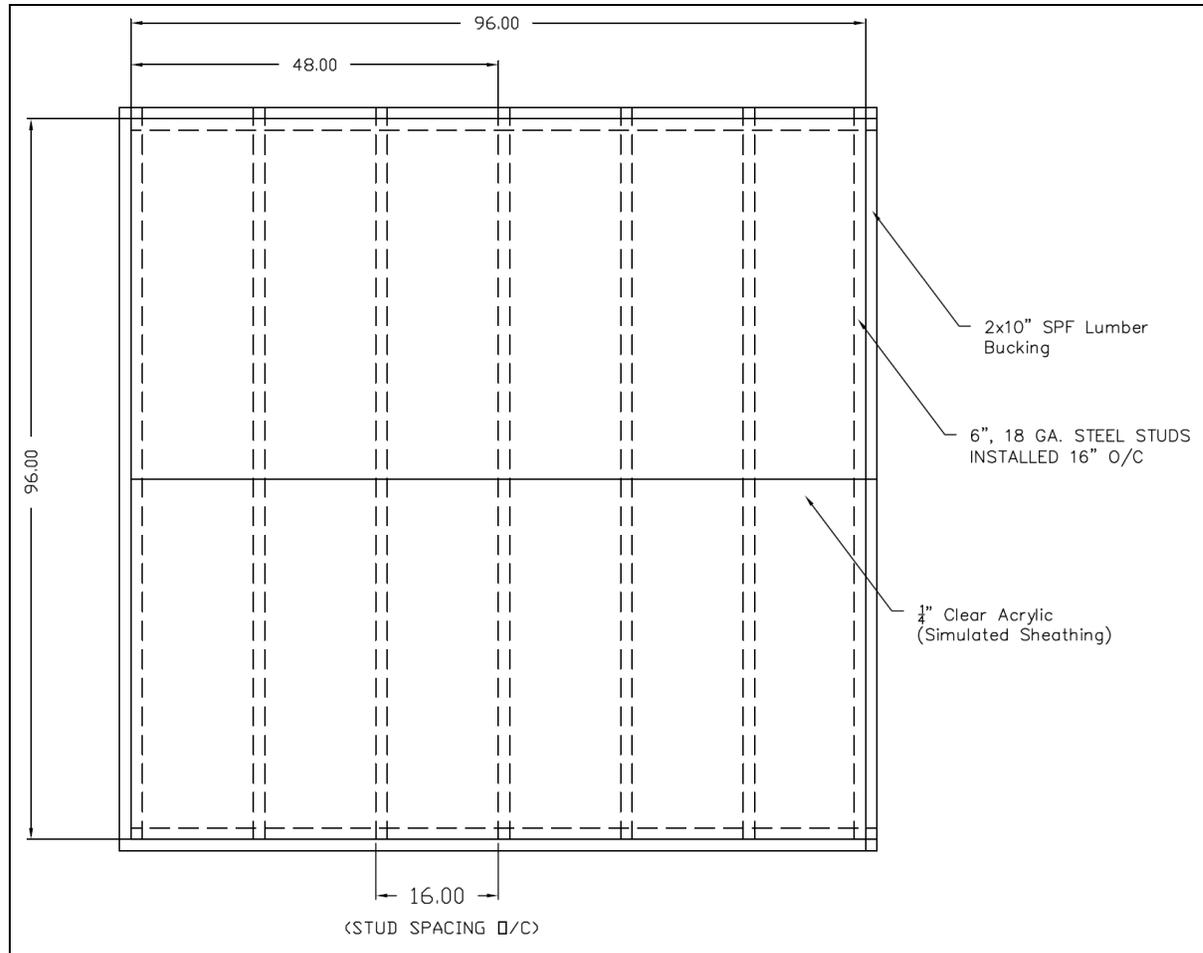


Figure 1 – Back-up Test Wall Framing Construction

3.0 RESULTS

Table No. 1 - Summarized Air Leakage Results Configuration 1 – ASTM E283-04 (2012) Exova Specimen No.: 18-06-B0193-1 (Test Date: November 12, 2018)		
Test Pressure Differential (Pa)	Infiltration	Exfiltration
75 Pa (1.57 lbs./ft <sup>2</sup> )	0.01 L/s m <sup>2</sup> (0.003 CFM/ft <sup>2</sup> )	0.02 L/s m <sup>2</sup> (0.003 CFM/ft <sup>2</sup> )
300 Pa (6.24 lbs./ft <sup>2</sup> )	0.02 L/s m <sup>2</sup> (0.006 CFM/ft <sup>2</sup> )	0.02 L/s m <sup>2</sup> (0.006 CFM/ft <sup>2</sup> )

Table No. 2 - Summarized Water Penetration Resistance Results Configuration 1 – ASTM E331-00 (2016) Exova Specimen No.: 18-06-B0193-1 (Test Date: November 12, 2018)		
Test Pressure Differential (Pa)	Test Period (Minutes)	Observations
300 (6.24 lbs./ft <sup>2</sup> )	15	No water penetration was observed or droplets present on simulated exterior sheathing

Table No. 3 - Summarized Air Leakage Results Configuration 2 – ASTM E283-04 (2012) Exova Specimen No.: 18-06-B0193-1 (Test Date: November 12, 2018)	
Test Pressure Differential (Pa)	Infiltration <sup>(1)</sup>
75 Pa (1.57 lbs./ft <sup>2</sup> )	0.55 L/s m <sup>2</sup> (0.108 CFM/ft <sup>2</sup> )

<sup>(1)</sup> Forty-eight (48) 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 508-14, Section 5.2.2.

**3.0 RESULTS (CONTIUNED)**

<b>Table No. 4 - Summarized Water Penetration Resistance Results                      Configuration 2 – AAMA 508-14, Section 5.7, Referencing ASTM E331-00 (2016)                      Exova Specimen Number: 18-06-B0193-1 (Test Date: November 13, 2018)</b>			
<b>Test Pressure                      Differential                      (Pa)</b>	<b>Test Period                      (Minutes)</b>	<b>Observations</b>	<b>Comments</b>
300 (6.24 lbs./ft <sup>2</sup> )	15	3.7 % of air/water barrier surface area had water misting and / or water droplets.  All water that penetrated the exterior rain screen cladding was controlled and drained to the exterior with no continuous streaming observed	<b>Meets Requirement<sup>(2)</sup></b>

<sup>(2)</sup> **AAMA 508-14, Section 5.7 Water Penetration Requirements:**

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.

Failure shall be defined as water mist or water droplets appearing in excess of 5% of the air/water barrier surface, or continuous streaming at any location on the air/water barrier.

3.0 RESULTS (CONTIUNED)

Table 5 – AAMA 508-14, Section 5.8, Referencing ASTM E330-14 Static Structural Performance (Preload and Design Pressure) <sup>(4)</sup> Exova Specimen Number: 18-06-B0193-1 (January 16, 2019)			
Test	Requirements	Test Results	Comment
Static Structural Performance (Section 5.8)	<b>ASTM E330-14</b> Preload (0.5 x Design Pressure)  +/- 1,795 Pa (37.5 PSF)  <b>Requirements:</b> - No permanent damage-	No Permanent Damage Observed	No visual damage or buckling observed
	<b>ASTM E330-14</b> Design Pressure  +/- 3,591 Pa (75.0 PSF) <sup>(3)</sup>  <b>Requirements:</b> - Report Support Wall Deflection	Stud Length (L) = 2,438 mm (96.0 inches) Allowable (L/180) = 13.54 mm (0.533 inches)  <b>Vertical Net Deflection at Design Pressure:</b>  + 3,591 Pa (75.0 PSF) = -2.04 mm (0.08 inches)  - 3,591 Pa (75.0 PSF) = 0.60 mm (0.02 inches)  <b>Horizontal Net Deflection at Design Pressure:</b>  + 3,591 Pa (75.0 PSF) = -1.87 mm (0.07 inches)  - 3,591 Pa (75.0 PSF) = 3.53 mm (0.14 inches)  - No Permanent Damage Observed	<b>Meets Requirements</b>  L/180

<sup>(3)</sup> 3,591 Pa = 76.6 m/s (or 171 mph / 275 km/h). Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ , V is m/s & P is N/m<sup>2</sup>

<sup>(4)</sup> AAMA 508-14, Section 5.8 states: "When testing the actual air/water barrier for a project specific system, perform static structural performance test ASTM E330 at 0.5, 1.0 and 1.5 times the specified positive and negative design pressures." As the testing outlined in this report was not for a project specific system, a design pressure was not outlined. However, Exova performed structural testing of the AAMA 508-14 system in accordance with ASTM E330-14 with an assumption Design Pressure of ±3,591 Pa (171 mph / 275 km/h) for informational purposes.

3.0 RESULTS (CONTIUNED)

Table 6 – AAMA 508-14, Section 5.8, Referencing ASTM E330-14 Static Structural Performance (Structural Pressure) <sup>(6)</sup> Exova Specimen Number: 18-06-B0193-1 (January 16, 2019)			
Test	Requirements	Test Results	Comment
<b>Static Structural Performance</b> (Section 5.8)	<b>ASTM E330-14</b>  Structural Test Pressure (1.5 x Design Pressure)  +/- 5,386 Pa (112.5 PSF) <sup>(5)</sup>  <b>Requirements:</b> - No permanent damage - Report Support Wall Deflection	<b>Vertical Net Deflection at Design Pressure:</b> + 5,386 Pa (112.5 PSF) = -0.44 mm (0.02 inches)  <i>Residual Deflection</i> -0.64 mm (0.03 inches)  - 5,386 Pa (112.5 PSF) = 1.36 mm (0.05 inches)  <i>Residual Deflection</i> 0.25 mm (0.01 inches)	<b>No Permanent Damage Observed</b>
		<b>Horizontal Net Deflection at Design Pressure:</b> + 5,386 Pa (112.5 PSF) = -1.24 mm (0.05 inches)  <i>Residual Deflection</i> -0.64 mm (0.03 inches)  - 5,386 Pa (112.5 PSF) = 1.44 mm (0.06 inches)  <i>Residual Deflection</i> 1.42 mm (0.06 inches)  - No Permanent Damage Observed	

<sup>(5)</sup> 5,386 Pa = 93.7 m/s (or 209 mph / 337 km/h). Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ , V is m/s & P is N/m<sup>2</sup>

<sup>(6)</sup> AAMA 508-14, Section 5.8 states: "When testing the actual air/water barrier for a project specific system, perform static structural performance test ASTM E330 at 0.5, 1.0 and 1.5 times the specified positive and negative design pressures." As the testing outlined in this report was not for a project specific system, a design pressure was not outlined. However, Exova performed structural testing of the AAMA 508-14 system in accordance with ASTM E330-14 with an assumption Design Pressure of ±5,386 Pa (209 mph / 337 km/h) for informational purposes.

3.0 RESULTS (CONTIUNED)

Table 7 – Client Specific (Requested) Testing Test to Failure in the Negative Wind Load Direction ASTM E330-14 – SI & IP Units Static Structural Performance Exova Specimen Number: 18-06-B0193-1 (January 16, 2019)	
Maximum Pressure Achieved	Comments
8,349 Pa <sup>(7)</sup>	Cladding System did not disengage from wall assembly. However, vertical supporting steel studs buckled in the center
174 lbs. /ft <sup>2</sup>	

<sup>(7)</sup> 8,349 Pa = 116.7 m/s (or 261 mph / 420 km/h). Load  
 Calculation based on the Enswiler formula, where  $P = 0.613 \cdot V^2$ ,  $V$  is m/s &  $P$  is N/m<sup>2</sup>

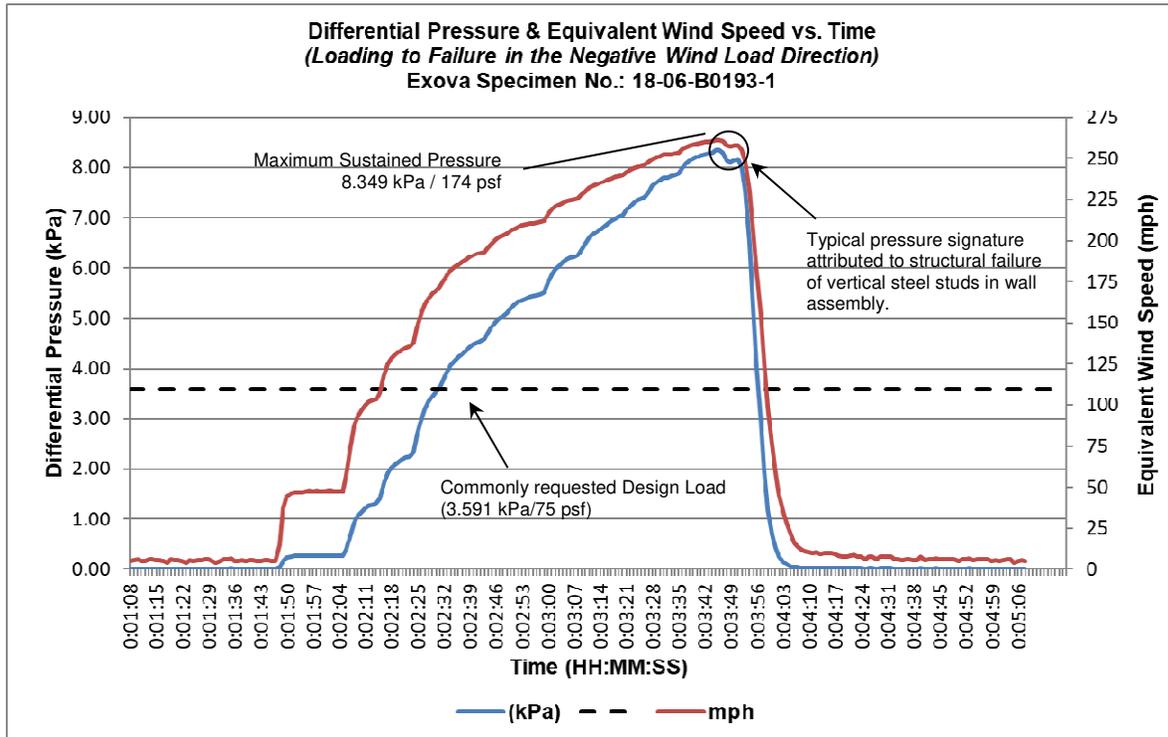


Figure 2 – Differential Pressure & Equivalent Wind Speed vs. Time (during testing to failure)

\*Note: Design loads are building and location specific. Please refer to architect or design engineer for specific building load requirements.

#### 4.0 SYSTEM MODIFICATIONS

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

#### 5.0 DISCUSSION

The Carter Architectural Panels Inc., "EVOPLATE™ Non-Combustible Rainscreen" (*Exova Specimen No.: 18-06-B0193-1*) identified in this report met the requirements of AAMA 508-14 for cavity pressure differential, time shift of pulse and water penetration.

The Carter Architectural Panels Inc., exterior panel system identified as the "FUSION™ Non-Combustible Rainscreen" (*Exova Specimen No.: 18-06-B0193-2*) as detailed in this report was tested in accordance ASTM E283-04(2012), ASTM E331-00(2016) and ASTM E330-14 and achieved the following:

- Air Leakage: 0.01 L/s m<sup>2</sup> (0.003 CFM/ft<sup>2</sup>) @ 75 Pa (1.57 lbs/ft<sup>2</sup>) – Infiltration  
0.02 L/s m<sup>2</sup> (0.003 CFM/ft<sup>2</sup>) @ 75 Pa (1.57 lbs/ft<sup>2</sup>) – Exfiltration  
0.02 L/s m<sup>2</sup> (0.006 CFM/ft<sup>2</sup>) @ 300 Pa (6.24 lbs/ft<sup>2</sup>) – Infiltration  
0.02 L/s m<sup>2</sup> (0.006 CFM/ft<sup>2</sup>) @ 300 Pa (6.24 lbs/ft<sup>2</sup>) – Exfiltration
- Water Penetration Configuration No. 1: 300 Pa (6.24 lbs. /ft<sup>2</sup>)  
Configuration No. 2: 300 Pa (6.24 lbs. /ft<sup>2</sup>)
- Structural-Performance: 3,591 Pa (75.0 lbs. /ft<sup>2</sup>) – Specified Design Load  
5,386 Pa (112.5 lbs. /ft<sup>2</sup>) – Structural Test Pressure  
8,349 Pa<sup>(8)</sup> (174.0 lbs. /ft<sup>2</sup>) – Maximum Pressure Achieved  
(Equivalent to 261 mph / 420 km/h based on Ensewiler formula)

<sup>(8)</sup> Cladding system did not disengage from the wall assembly. The "EVOPLATE™ Non-Combustible Rainscreen" did not fail at 8,349 Pa, whereas, the vertical steel studs behind the wall assembly buckled in the center, thereby, concluding the test procedure.

#### 6.0 REVISION HISTORY

<u>Report No:</u>	<u>Date:</u>	<u>Description of Revisions:</u>
18-06-B0193-F3	2019-03-16	Original Document

Reviewed by:

Reported & Authorized by:

  
Allan Lawrence, Ext. 11212  
Supervisor, Building Systems  
Products Division

  
Sunny Ling, C.E.T, Ext. 11412  
Assistant Operations Manager, Building Science  
Technical Manager, Building Systems  
Products Division

**APPENDIX A**

Specimen Bill of Materials and Drawings

(5 Pages)

### 2mm EVOPlate Testing Bill of Materials

#### Framework:

6 pcs 1.5" x 1.5" x 2" x 1.5" x 1.5" Pre-punched Top Hat 18 Gauge G-90 Galvanized profile

4 pcs 2" x 1.5" x 2" Pre-punched U-channel 18 Gauge G-90 Galvanized profile

100 pcs #12 x 1.5" self-drilling screws

#### Panel Assemblies

1 pc 47" X 94.5625" 2MM EVOPlate EVO Panel assembly

2 pcs Patented EVO 2mm perimeter extrusion square cut @ 43.75" 6061-T6

2 pcs Patented EVO 2mm perimeter extrusion square cut @ 91.375" 6061-T6

4 pcs EVO 2mm 60 Durometer High Temp Silicon Corner blocks

14 pcs EVO Aluminum Corner reinforcement bracket 3003 Alloy

2mm EVOPlate coil coated 5052-H32 solid aluminum skin

30 EVO Torxalig zinc coated screws

5 pcs Patented EVO Integrated stiffener square cut to 43.5" 6061-T6

2 tubes of Dymonic FC adhesive

5 pcs 1" x .5" bug screen to cover weep holes

1 pc 47" X 47" 2MM EVOPlate EVO Panel assembly (2 assemblies used in test)

4 pcs Patented EVO 2mm perimeter extrusion square cut @ 43.75" 6061-T6

4 pcs EVO 2mm 60 Durometer High Temp Silicon Corner block

8 pcs EVO Aluminum Corner reinforcement bracket 3003 Alloy

2mm EVOPlate coil coated 5052-H32 solid aluminum skin

16 EVO Torxalig zinc coated screws

2 pcs Patented EVO Integrated stiffener square cut to 43.5" 6061-T6

.5 tube of Dymonic FC adhesive

3 pcs 1" x .5" bug screen to cover weep holes

#### Wall assembly

1 pc Patented EVO Starter Strip 6061-T6 profile square cut to 94"

15 pc Patented EVO Mid-Clip 6061-T6 profile square cut to 3" with pre-punched slot (Mounted on 16" maximum centre distance)

20 pc Patented EVO Half-Clip 6061-T6 profile square cut to 3" with pre-punched slot (Mounted on 16" maximum centre distance)

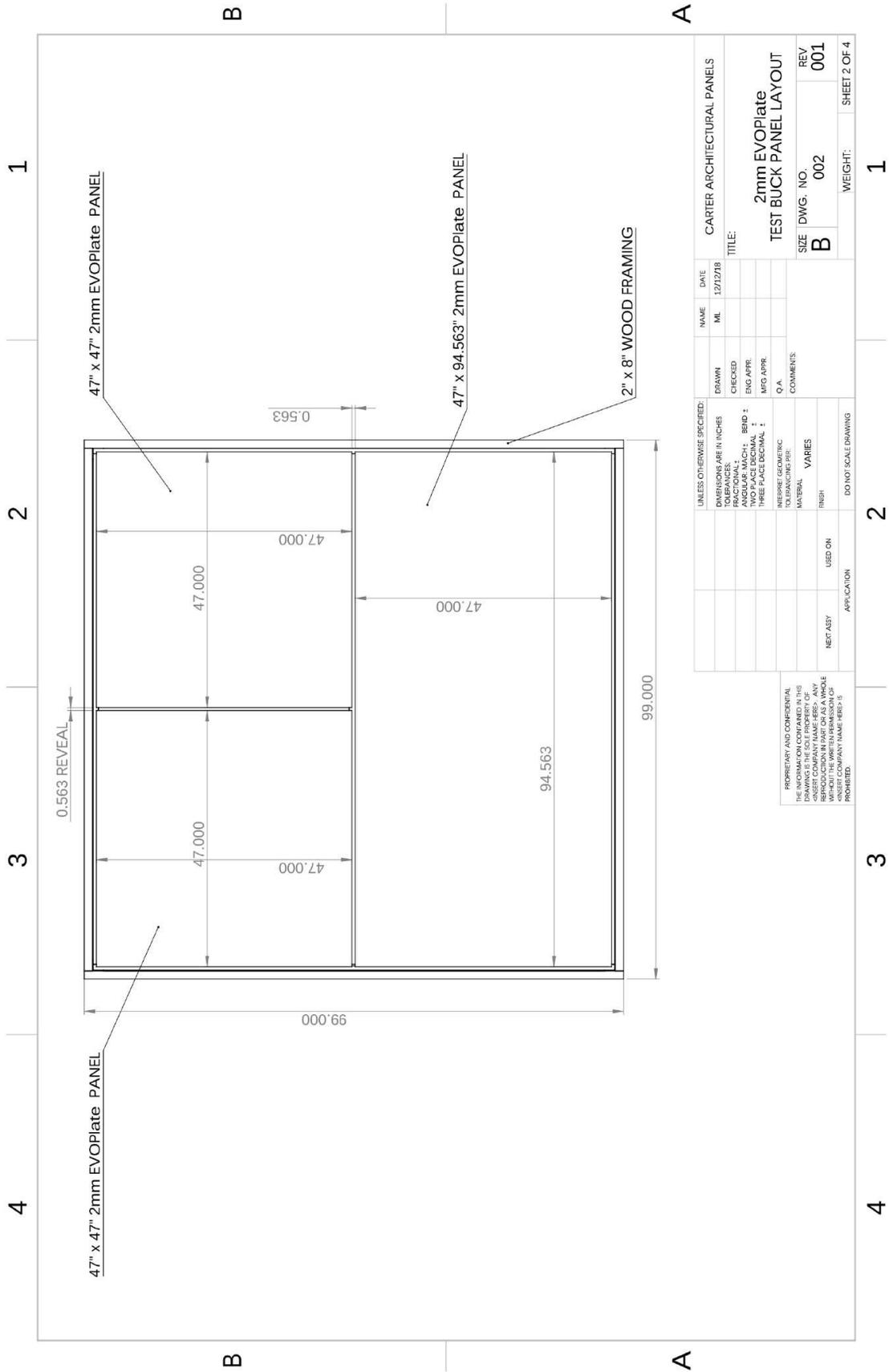
1 pc 2mm EVOPlate solid aluminum plate cut to 2" wide x 95" long (Horizontal Centre)

2 pc 2mm EVOPlate solid aluminum plate cut to 1.25" wide x 95" long (Top and bottom)

2 pc 2mm EVOPlate solid aluminum plate cut to 1.25" wide x 94" long (Sides)

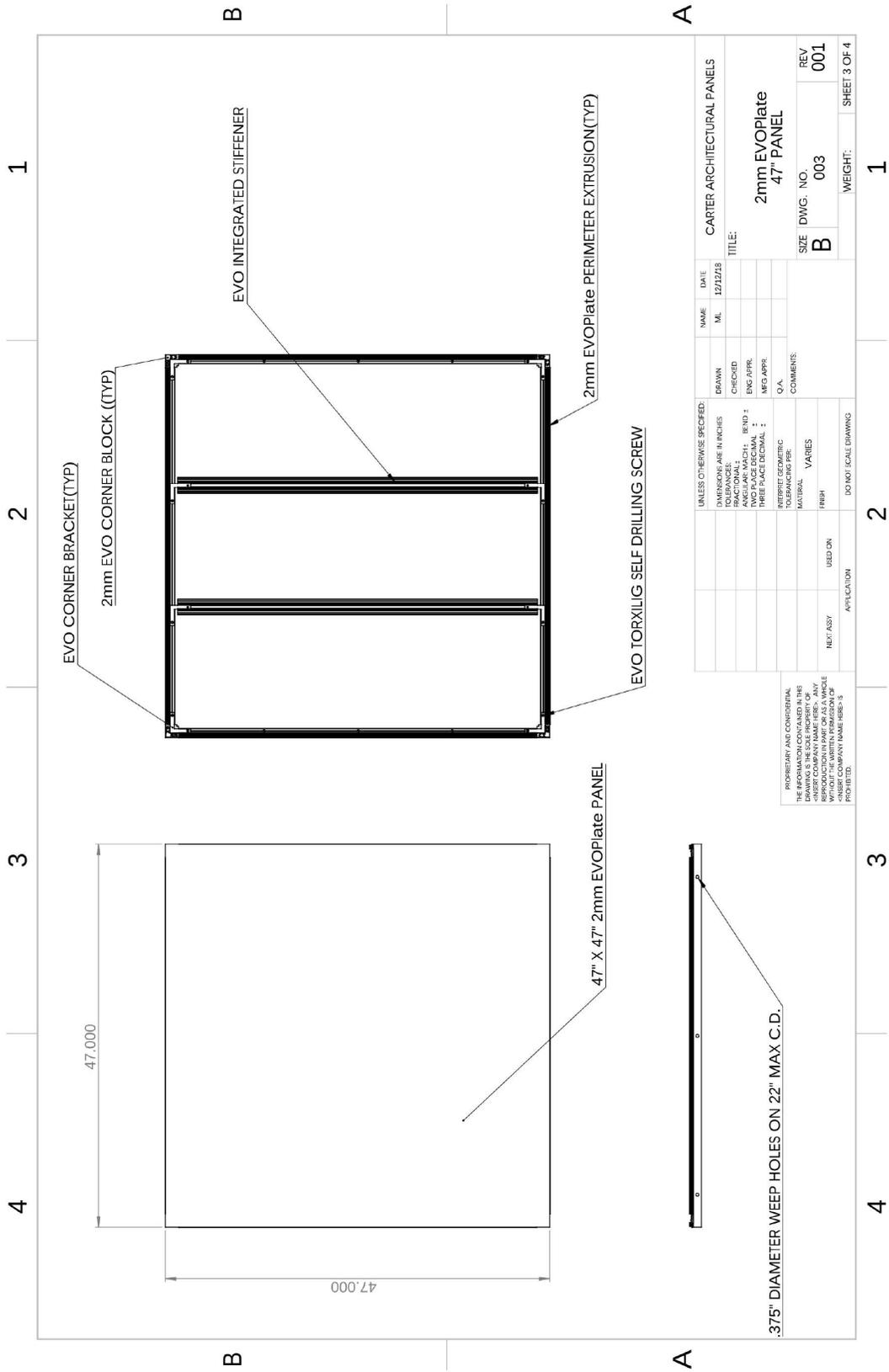
1 pc 2mm EVOPlate solid aluminum plate cut to 47" (Vertical centre)





UNLESS OTHERWISE SPECIFIED:		NAME	DATE	CARTER ARCHITECTURAL PANELS	
DIMENSIONS ARE IN INCHES	DRAWN	ML	12/12/18	TITLE:	
FRACTIONAL	CHECKED			2mm EVOplate	
ANGULAR, MACH. & BEND 1	ENG APPR.			TEST BUCK PANEL LAYOUT	
THREE PLACE DECIMAL 1	MFG APPR.			SIZE	DWG. NO.
WELDING, GEOMETRIC TOLERANCING PER:	Q.A.			B	002
MATERIAL VARIES	COMMENTS			REV	001
FINISH				WEIGHT:	SHEET 2 OF 4
DO NOT SCALE DRAWING	APPLICATION				
NET ASSY	USED ON				

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	CARTER ARCHITECTURAL PANELS	
DIMENSIONS ARE IN INCHES		ML	12/12/18	TITLE:	
FRACTIONAL DIMENSIONS TO BE SHOWN AS DECIMALS				2mm EVOplate	
ALL DIMENSIONS TO BE SHOWN TO TWO PLACE DECIMALS				47" PANEL	
ALL DIMENSIONS TO BE SHOWN TO THREE PLACE DECIMALS				SIZE	DWG. NO.
INTERPRET GEOMETRIC TOLERANCING PER: VARIATION				B	003
MATERIAL VARIES				REV	001
FINISH				WEIGHT: SHEET 3 OF 4	
DO NOT SCALE DRAWING				1	
APPLICATION				2	
USED ON				3	
NEXT ASY				4	

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Carter Architectural Panels, Inc.  
221 E. Willis Road, #18  
Chandler, AZ 85286

RESEARCH REPORT: RR 26177  
(CSI # 07 44 00)

Attn: Joel McKinley  
(480) 828-9648

REEVALUATION DUE  
DATE: July 1, 2020  
Issued Date: November 1, 2019  
Code: 2017 LABC

## **GENERAL APPROVAL – Correction – EvoPlate Rain Screen System**

### **DETAILS**

The EvoPlate Rain Screen System is an alternate exterior wall covering to those materials described in LABC Section 1405.2, and LARC Section R703.1 The EvoPlate Rain Screen System may not be used as a component of a fire-resistance-rated wall assembly.

The EvoPlate Rain Screen System consists of solid aluminum sheet (Grade 5754-H42 or 5052-H32) and aluminum extrusions (Grade 6061-T6). The aluminum EvoPlate sheet material, supplied by Architectural Systems Group, LLC, come in 48-inch and 60-inch wide by 196-inch long coil coated flat sheets with available panel thickness of 2 mm or 3 mm. All material is protected with PVC strippable film.

During installation, the EvoPlate aluminum panel shall be free of all fasteners in both panel face and panel perimeter. All mounting hardware must also be fully concealed with color matched splines utilizing the same paint technology as the coil coated aluminum panels provided by the manufacturer.

Panels shall be installed using a progressive system using sliding male-female clip components, which are held to the panel's perimeter extrusion, without the use of rivets or screws. The design and installation must enable a single panel to be independently removed and re-installed. The EvoPlate Rain Screen System panels are supplied with standard mounting hardware which includes the galvanized steel z-girts and mounting clips and aluminum starter extrusions.

The EvoPlate Rain Screen System is capable of withstanding transverse loads as specified in Table 1 of this general approval.

RR 26177  
Page 1 of 4

**The approval is subject to the following conditions:**

1. The EvoPlate Rain Screen System shall be installed in accordance with this report, the manufacturer's published installation instructions and the 2017 Los Angeles Building Code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report shall govern.
2. The EVOPlate Rain Screen System shall not be limited to application if installed as tested as the EVO system is a noncombustible wall panel design. (Note: If the proposed wall design is inclusive of exterior insulations, it too must be of noncombustible properties i.e. Mineral Wool).
3. A water resistive barrier complying with Section 1403.2 of the 2014 Los Angeles Building Code must be used in conjunction with the EvoPlate Rain Screen System. The water resistive barrier must be installed over the sheathing assembly.
4. The allowable transverse loads must be as set forth in Table 1 of this general approval.
5. The EvoPlate Rain Screen System shall be manufactured by a Los Angeles City approved fabricator.
6. The EvoPlate Rain Screen System Panels and boxes of accessories are labeled with the name and address of the manufacturer (Cater Architectural Panels); the product name and the Los Angeles Research Report number (LARR 26177).

Carter Architectural Panels, Inc.  
Re: EvoPlate Rain Screen System

## DISCUSSION

The correction is to capture a revised Condition No. 2 of this general approval to allow installation of the panels on structures of noncombustible construction.

This report is in compliance with the 2017 City of Los Angeles Building Code.

The approval is based on data in accordance with the AAMA 508-14 for Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

---

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Engineering Research Section  
201 N. Figueroa St., Room 880  
Los Angeles, CA 90012  
Phone: (213) 202-9812  
Fax: (213) 202-9943

EB  
LARR 26177  
TLB1900018  
R02/13/2019  
1403

**Table 1 - EvoPlate ALLOWABLE WIND PRESSURE <sup>1,2,3,4,5</sup>**

Panel Size (inches)	Design Pressure (psf)
47	75

<sup>1</sup>Panel meets L/60, panel perimeter framing and stiffeners meet L/180

<sup>2</sup>Design pressure utilizes Carter I-Beam panel stiffeners at 16" on center

<sup>3</sup>Connection to structure assumes a minimum of 16ga. 50ksi steel fastened with two #12-14 ELCO Drill-Flex

<sup>4</sup>Design pressure per ASTM E330-14 test report 18-06-B0193-F3 dated 3/16/2019 with a factor of safety of 1.5

<sup>5</sup>Design pressure per out-of-plane loading only on flat wall application



## SECTION 07 42 43

# **EVO™ RIVETLESS™** 2MM & 3MM PRE-PAINTED EVOPlate™ Non-Combustible WALL PANEL SPECIFICATION

***SPEC NOTE:** Reference performance evaluation of the “EVOPlate non-combustible rainscreen system” Report- 18-06-B0193-F1, revision 1. Report date January 31, 2019. (see Sec 1.05.1.5 Submittals)*

### **PART 1 - GENERAL**

#### 1.01 SECTION INCLUDES

- .1 EVOPlate, Aluminum Plate Panel [pressure equalized rainscreen] [dry- seal] panels.
- .2 [Supply only] [Supply and install].

*. SPEC NOTE: Re 101.3. Items listed are available at extra cost and not included with basic panel package.*

- .3 Accessories including Z-girts, roof caps, drip flashing, jamb flashing through wall flashing, and all other architectural trims, fasteners and vapour and air barriers.

#### 1.02 RELATED REQUIREMENTS BY OTHERS

- [.1 Section 06 10 00 – Rough Carpentry]
- [.2 Section 07 21 00 – Thermal Insulation]
- [.3 Section 07 27 00 – Air Barrier]
- [.4 Section 07 92 00 – Joint Sealants]

#### 1.03 REFERENCE STANDARDS

- .1 Aluminum Panels
  - .1 AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

- .2 ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

#### 1.04 PRE-INSTALLATION MEETINGS

- .1 Coordinate products, techniques and sequencing of related work with Section [01 31 19 - Project Meeting] [and] [ 01 31 19.33-Pre-Installation Meetings].

#### 1.05 SUBMITTALS

- .1 Under provisions of [Section 01 33 00], provide the following:
  - .1 LEED Credits: Conform to [Section 01 81 13 “Sustainable Design Requirements”] for documentation of LEED Credits re: Certification of Project under LEED [caGBC] [USGBC] 2012 Rating System.
  - .2 Product Data: manufacturer’s printed sheets or pages illustrating the products to be incorporated into the project.
  - .3 Shop Drawings: Detail drawings showing openings, components, panel profile, dimensions, and other details of each condition and attachment such as treatment at edges, terminations, and flashings.
  - .4 Product Samples: 150 mm x 150 mm (6” x 6”) showing specified finish for each location.
  - .5 Product Test Reports: Indicate compliance of product requirements from qualified independent testing agency.
  - .6 Manufacturer’s Instructions: Indicate installation requirements, rough-in dimensions, and special procedures.
  - .7 Sample Warranty: As specified by this Section.
  - .8 Maintenance Data: Panel replacement instructions and cleaning information.

#### 1.06 QUALITY ASSURANCE

- .1 Metal Wall Panel Manufacturer Qualifications: Minimum 10 years’ experience in metal fabrication and supplying metal wall panel systems.
- .2 Metal Wall Panel Installer Qualifications: Minimum 10 years’ experience installing commercial metal wall panel systems.
- .3 Metal Wall Panel Manufacturers must be an approved EVO™ Licensee and must manufacture EVO™ architectural panels to the tolerances and attributes established under the provisions of the EVO™ North American Licensees and their standards of conduct.

Visit [www.carterpanels.com](http://www.carterpanels.com) for information on approved fabricators.

## 1.07 DESIGN & PERFORMANCE REQUIREMENTS

- .1 **Design**, fabricate and install EVOPlate™ Non-Combustible Aluminum Panels as a pressure equalized rainscreen panel system, to the following standards & requirements:
  - .1 The Aluminum Plate panel design MUST be 100% free of all fasteners in both the panel face and panel perimeter. All mounting hardware must also be fully concealed with color matched splines utilizing the same Kynar/PvDF paint technology as the coil coated Aluminum Panel, provided by manufacturer.
  - .2 Only a Progressive System (independent panel, one-from-another), using sliding male-female clip components, which are held to the panels perimeter extrusion, without the use of rivets or screws, meets the description of an engineered EVO™ RIVETLESS™ panel design. This design must enable a single panel to be independently removed and re-installed.
  - .3 Any Aluminum Plate Panel system not meeting the standards & requirements outlined above (1.07.1.1; 1.07.1.2), or any panel system utilizing a track or grid layout, or one that involves a “picture frame style” post-painted extrusion incorporating a face panel, or one that utilizes adhesives in place of mechanical fasteners in the panel design, are NOT considered as equal or comparable in design or performance, to the EVO™ RIVETLESS™ architectural panel system.

- .2 **Structural Performance:** The EVOPlate™ Non-Combustible Aluminum EVOPlate panel system is capable of withstanding the effects of the following loads, based on testing in accordance to **ASTM E 330-14 (2014)**:

*Note: The default deflection of the support framing was restricted to L/180 referencing AAMA 508-14 Section 5.8*

- .1 Structural Test Pressure (Table 7) ( $1.5 \times \text{Design Pressure} \pm 3,591 \text{ Pa}$ ) = **5,386 Pa<sup>1</sup> (112.5 lbs/ft<sup>2</sup>)**
- .2 Vertical Net Deflection: ( $\pm 5,386 \text{ Pa}; 112.5 \text{ lbs/ft}^2$ ) = -0.02” (-0.44mm), 0.05” (1.36mm)
- .3 Horizontal Net Deflection: ( $\pm 5,386 \text{ Pa}; 112.5 \text{ lbs/ft}^2$ ) = -0.05” (-1.24 mm), 0.06” (1.44mm)
- .4 Wind Load: Maximum Pressure Achieved = **8,349 Pa<sup>1</sup> (174 lbs/ft<sup>2</sup>)**;  
(Table 8)

*(equivalent to 261 mph / 420 km/h; based on the Ensewiler formula)*

(<sup>1</sup> Cladding system did not disengage from the wall assembly. The EVO™ RIVETLESS™ panel system did not fail at 8,349 Pa., whereas, the vertical supporting steel studs buckled in the center)

- .3 **Air Infiltration:** Air leakage of not more than 0.06 cfm/ lbs/ft<sup>2</sup> (0.3 L/s per sq. m) when tested according to **ASTM E 283-04** (2012), at the following test-pressure difference:
  - .1 **EVO™ RIVETLESS™ panel systems Test-Pressure Differential - Infiltration:**
    - 75 Pa @ 1.57 lbs/ft<sup>2</sup> : 0.01 L/s m<sup>2</sup> (0.00 CFM/ft<sup>2</sup>)
    - 300 Pa @ 6.24 lbs/ft<sup>2</sup> : 0.02 L/s m<sup>2</sup> (0.00 CFM/ft<sup>2</sup>)
- .4 **Water Penetration under Static Air Pressure:** No uncontrolled water penetration when tested according to **ASTM E 331-00** (2016) at the following test-pressure:
  - .1 Test-Pressure: 300 Pa (6.24 lbs/ft<sup>2</sup>); (< 5% of air/water barrier surface effected) *Note: No water penetration observed or droplets present on simulated exterior sheathing.*
- .5 **Dynamic Water Penetration:** No uncontrolled water penetration when tested according to **AAMA 501.1-17** at the following test-pressure:
  - .1 Test-Pressure: 300 Pa (6.24 lbs/ft<sup>2</sup>); (< 5% of air/water barrier surface effected) *Note: No water penetration observed or droplets present on simulated exterior sheathing.*
- .6 **Pressure Equalization Behaviour Analysis (Table 3):** The EVOPlate™ Non-Combustible wall panel system meets the requirements for Wind Gust Pressure Differential:
  - .1 **Maximum External Gust Pressure** = 24.6 lbs/ft<sup>2</sup> @ 1,178 Pa = 21.2% pressure differential, as required by AAMA 508-14, Section 5.5 (ASTM E1233-14).
- .7 **Thermal Movements:** EVO™ Aluminum panel system has been designed to accommodate vertical and horizontal thermal movement of components, preventing buckling, opening of joints and other detrimental effects when subjected to seasonal temperature cycles. Systems that incorporate enlarged holes or loose fitting attachments to accommodate for thermal fluctuations, are **NOT** considered as equal or comparable in design or performance, to the EVO™ architectural panel system.
  - .1 Temperature Change (Range): [120 deg F 67 deg C , ambient; 180 deg F 100 deg C , material surfaces ].
- .8 **Fire Propagation Characteristics:** EVOPlate™ Non-Combustible Solid Aluminum wall panel system has been tested to NFPA 285 protocol.
  - .1 EVOPlate™ Non-Combustible panel system has been passed and approved by a qualified testing agency, certified to conduct the **NFPA 285 Fire Test Method** on wall panel assembly systems.

## 1.08 TECHNICAL DATA

Applicable Standards for the EVOPlate™ Non-Combustible, EVO™ RIVETLESS™ wall panel systems:

### RAINSCREEN TESTING

AAMA 508-14 Compliant

### AIR/WATER/WIND PERFORMANCE

AAMA 501.1-17 (Dynamic)

ASTM E 1233-14 (Modified)

ASTM E 283-04 (2012)

ASTM E 330-14 (2014)

ASTM E 331-00 (2016)

### FIRE TEST METHOD

#### NFPA 285

Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

## 1.09 MOCK-UP

*SPEC NOTE: Mock-up is only specified for special or large projects and only upon request.*

- .1 Provide a mock-up on building consisting of complete cladding system, including but not limited to metal furring, panels, securement devices, sealants, and mouldings for approval. Cladding finish and mouldings to be of finish and color as designated by the [Architect].
- .2 Location of mock-up to be as directed by [Architect]. Size to be four panels minimum in a 2 over 2 configurations. Alternate pattern can be requested by Architect.
- .3 Modify mock-up as necessary for [Architect] approval. Mock-up [may] [may not] remain in place as part of completed work. Mock-up to represent standard for completed work.

## 1.10 DELIVERY, STORAGE, AND HANDLING

- .1 Handle and store products to prevent damage, soiling, and in accordance with manufacturer's instructions.
- .2 Store packaged or bundled products in original and undamaged crates with manufacturer's seals and labels intact. Do not remove from packaging or crates until required for installation.

## 1.11 PACKAGING WASTE MANAGEMENT

- .1 Return undamaged pallets and crates to manufacturer of systems employed. All other plastics, packaging foam, banding and fasteners are to be disposed of by panel installer.

## 1.12 ENVIRONMENTAL CONSIDERATIONS (LEED)

- .1 6061-T6 EVO™ Extrusion

Material percentages may vary from batch to batch. Standard aluminum blending formulas call for a **minimum of 10% post-consumer aluminum in every blend**. *The final percentage is between 10% and 15% on 6063 type grades (industry standard)*. 6061 alloys often have a much higher percentage of post-consumer scrap. These alloys can contain in excess of **75%**. The EVO™ architectural panel system is produced using 6061-T6.

- .2 EVOPlate™ coil coated 60”x196” aluminum sheet.

5000 Series- 40 % pure aluminum ingot, 60 % pre-consumer (include alloys constituent)

## 1.13 WARRANTY

- .1 EVOPlate™ Finish Coating Performance: Provide manufacturer’s standard [10, 20, 30 year] warranty against fading, color change, chalking, peeling, cracking, or delaminating of the coating system.
- .2 Crack, Flake or Peel for Twenty (20) YEARS. Chalk for Twenty (20) YEARS. Change Color for Twenty (20) YEARS.

(subject to the other terms and conditions of this Agreement, the “Limited Warranty”).

**\*\* This is not a corrosion warranty\*\*.**

## PART 2 – PRODUCTS

### 2.01 MANUFACTURERS

- .1 Aluminum plate panels to be obtained as single source from approved manufacturer. Visit [www.carterpanels.com](http://www.carterpanels.com) to locate Licensee in your region.
- .2 EVOPlate™ - Coil Coated Aluminum Sheet
  - .1 Architectural Systems Group LLC- 221 E Willis Rd #18, Chandler, AZ 85286
  - .2 Aluminum Sheets:
    - .1 Thickness: 2mm or 3mm
    - .2 Alloy: 5754- H42 or 5052-H32 Series (Pre-Painted material)
  - .3 Panel Thickness and Weight:
    - .1 [2mm: 1.13 lbs./ft<sup>2</sup>] [3mm: 1.78 lbs./ft<sup>2</sup>]
  - .4 Core: Solid Aluminum Alloy
  - .5 Fire Performance
    - .1 ASTM E 84: Flame Spread = "Passed Class A"
    - .2 Smoke Developed = "Passed Class A"
    - .3 NFPA 285 Tested EVOPlate™
    - .4 Physical Properties

Chemical Name †	EC No.	CAS-No.	Composition *	Classification
Aluminum	231-072-3	7429-90-5	92 - 99%	-
Magnesium	231-104-6	7439-95-4	0.2 - 5.6%	F;R11, R15
Manganese	231-105-1	7439-96-5	0.05 - 1.4%	Xn;R48/20
Chromium	231-157-5	7440-47-3	0 - 0.35%	-
Iron	231-096-4	7439-89-6	0 - 0.35%	-
Silicon	231-130-8	7440-21-3	0 - 0.2%	-

.6 Aluminum Sheet Performance by Grade

.1	<u>Material</u>	<u>Tensile</u>	<u>Yield</u>	<u>Elongation</u>
	5052-H32	31-38	23.0 min	4 min

.2 EVOPlate™ Coating Performance

- Pencil Hardness (ASTM D 3363<sup>1</sup>): F-H, Eagle Turquoise
- Gloss @ 60° (ASTM D 523): 15 to 40
- Solvent Resistance (ASTM D 5402): 100+ MEK double rubs

- Reverse Impact Resistance (ASTM D 2794<sup>2</sup>): 1.5 x metal thickness/no pick-off or cracking
- Flexibility/T-Bend (ASTM D 4145<sup>2</sup>): 2T no pick-off
- Metal Marking Resistance: Excellent
- Humidity Resistance (ASTM D 2247, ASTM D714): No blistering, loss of adhesion, or discoloration after 1500 hours exposure to 100% relative humidity
- Salt Spray Resistance (ASTM B 117, ASTM D714): None or few #8 blisters and no more than 1/16” creepage from a score line using 5% salt solution for 1500 hours
- South Florida Exposure: 20 years @ 45°, Less than 5.0 ΔE, Chalk rating of no less than 8
- QUV-A Accelerated Weathering (ASTM G154, ASTM D2244): Less than 3.0 ΔE, 70% gloss retention for 2000 hours

## 2.02 MATERIALS

*SPEC NOTE: Delete items not required.*

### .1 Aluminum Plate Wall Panel Systems

- .1 EVO™ Architectural Panels by (Licensee name)[Pressure Equalized Rainscreen] [dry-seal] wall cladding.
- .2 Thickness: 2 mm, 3 mm .
- .3 Panel Depth: (1.75”) from face of panel too substrate.
- .4 Core: N/A- Solid Aluminum Alloy
- .5 EVOplate™: [Solid Aluminum coil coated flat sheet 60”x196”] or approved alternate.
- .6 Manufacturer’s standard, as shown on drawings, and as follows:
  - .1 Z-girts: [18 ga.; 16 ga.] steel galvanized to ASTM A653 G90.
  - .2 Aluminum Extrusions: EVO™ Rivetless extrusions (patent), Mill finish (6061-T6).

## 2.03 FABRICATION

*SPEC NOTE: see Quality Assurance (1.06.3 above for Manufacturer qualifications/criteria)*

### .1 Solid Aluminum Wall Panels

- [.1 2MM or 3MM coil coated 5000 series aluminum plate alloy.]
- .2 Fabrication Method: Rout and return system utilizing a CNC cutting table with automatic pressure foot to control cutting depth and vacuum bed for sheet support.
  - .1 Fabrication Method: Prepare EVO™ RIVETLESS™ extrusions for securing to EVOPlate™ panel in accordance with manufacturer’s written instructions and in accordance with AAMA 508-04. (High temperature silicone, PER Corner Blocks)
- .3 Fabricated Panel Tolerances
  - .1 Length: Plus 1.6 mm (0.062 inch).
  - .2 Width: Plus 1.6 mm (0.062 inch).
  - .3 Depth: Plus or minus 0.2 mm (0.008 inch).
  - .4 Panel Bow: 0.8 percent maximum of panel length or width.
  - .5 Squareness: 5 mm (0.2 inch) maximum.
- .4 Rainscreen Panels: Provide for positive drainage of condensation and water entering at joints to exterior face of wall in accordance with “Rain Screen Principles”. Panels to have drainage holes in bottom of each panel measuring 10 mm (3/8”) diameter on 610mm (24”) centres, to AAMA 508-14.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- .1 Verify that substrate conditions are acceptable (plumb and level) prior to installation of products. Commencement of work or any parts thereof indicate acceptance of prepared substrates.
- .2 Surfaces to receive panel system barrier to be sound, dry, clean, and free from oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas to provide an even plane.

### **3.02 PREPARATION**

- .1 Protect adjacent work areas and finished surfaces from damage by this Section of Work.

### **3.03 INSTALLATION**

- .1 EVO™ RIVETLESS™ Panels

- .1 Install panels plumb, level and true, and in accordance with manufacturer's written instructions.
- .2 Anchor panels securely in place in accordance with fabricator's approved shop drawings.
- .3 Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels not to exceed 6.4 mm (0.25") in 6.1 m (20 feet), non-cumulative.

#### 3.04 SITE QUALITY CONTROL

- .1 Upon Owner's request, provide wall panel fabricator's site service or periodic site visit to inspect product installation in accordance with fabricator's instructions.

#### 3.05 ADJUSTING

- .1 Repair panels with minor damage so that repairs are not discernible at a distance of 3.1m (10'-0").
- .2 Remove and replace panels damaged beyond repair.
- .3 Remove protective film immediately upon completion of panel installation and prior to application of any joint sealants.

#### 3.06 CLEANING

- .1 Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

#### 3.07 WASTE MANAGEMENT

- .1 Remove from site damaged panels, packaging, temporary coverings, protective film and other debris resulting from the Work of this Section.

#### 3.08 PROTECTION

- .1 Protect installed panel finishes from damage during construction.
- .2 Provide protective measures as required to ensure that installed panels are not damaged by the work of other trades.

**END OF SECTION**

**ZERO  
RIVETS**

**RIVETLESS™ PANEL SOLUTION**



ARCHITECTURAL PANEL SYSTEM

# 100% CONCEALED FASTENERS

## ARCHITECTURAL PANEL TYPE

### EVO™ RIVETLESS™

Innovative – Patent Pending

Free of exposed fasteners

NO RIVETS = Elegant appearance

Superior Structural performance

Standardized System by design

Coast-2-Coast Mfg consistency

Available thru US & CDN partners

NFPA285 tested with EVOMAXci™

EVO™ Integrated Stiffener

Value Engineered: various finishes

EVOWOOD/EVOSTONE/EVOEXOTIC

Matched look = less load and \$ave

Able to replace individual panels

Panels are deliverable to site faster

### RIVETTED (OTHERS)

Status Quo

Unightly screws and rivets

Color match screws and rivets

No manufacturing consistency  
between fabricators

## A PARADIGM SHIFT IN THE MAKING

Our objective is to establish the EVO™ RIVETLESS™ panel system as the highest standard of ACM panels, anywhere.

EVO's™ elegant appearance offers superior Value and Performance to any type of façade, simple or complex.

EVO's™ Exclusive Manufacturer's Network in North America, ensures Quality Assurance in production and installation procedures, attainable through our standardized system design. Architects, Developers and decision-makers, will appreciate excellence in our planning, execution, delivery and service follow thru, as being a signature of our Network.

The EVO™ Network provides a collaborative resource between manufacturer's to complete projects on-time, discuss innovations, remain competitively positioned with broad appeal in N. America and confidently be the leaders within their industry, year-after-year.

Future testing for compliance to: CAN/ULC S134-13, Miami-Dade HVHZ tests and others, will continue to position EVO™ RIVETLESS™ at the forefront of innovative solutions.

## TESTED + CERTIFIED

Reaching New Heights with these Professionals

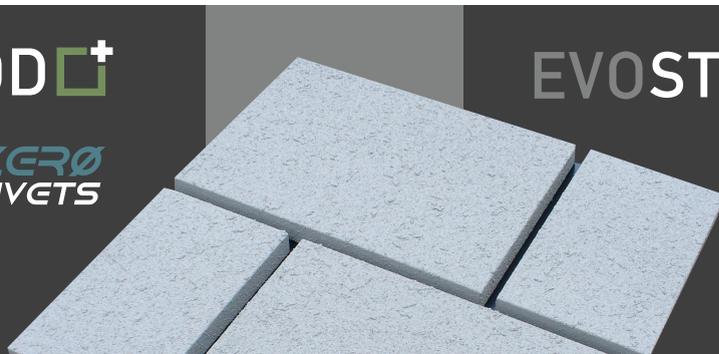


EVOWOOD 

ZERO  
RIVETS

EVOSTONE 

ZERO  
RIVETS



# PERFORMANCE + TECH SPECS

## RAINSCREEN TESTING

AAMA 508 - 07 COMPLIANT  
Voluntary Test Method and Specification  
for Pressure Equalized  
Rain Screen Wall Cladding Systems

## AIR/WATER/WIND PERFORMANCE

AAMA 501.1-05 (Dynamic)  
ASTM E 1233 (Modified)  
ASTM E 283 (Static)  
ASTM E 330 (Static)  
ASTM E 331 (Static)

## EVO STONE PERFORMANCE

Evaluation of EVO STONE Coating  
System testing in accordance with:  
ASTM B117-11 (Salt Spray)  
ASTM D4541-09 (Adhesion Strength)  
ASTM D2794 (Impact Resistance)  
ASTM D6944-09 (Thermal Cycling)  
ASTM D2247-11 (Humidity Resistance)  
ASTM G155 (Accelerated Weathering)  
ASTM D1654 (Corrosion Creepback)

## FIRE TEST METHOD

NFPA 285  
Standard Fire Test Method For  
Evaluation of Fire Propagation  
Characteristics of Exterior Non  
Load Bearing Wall Assemblies  
Containing Combustible Components

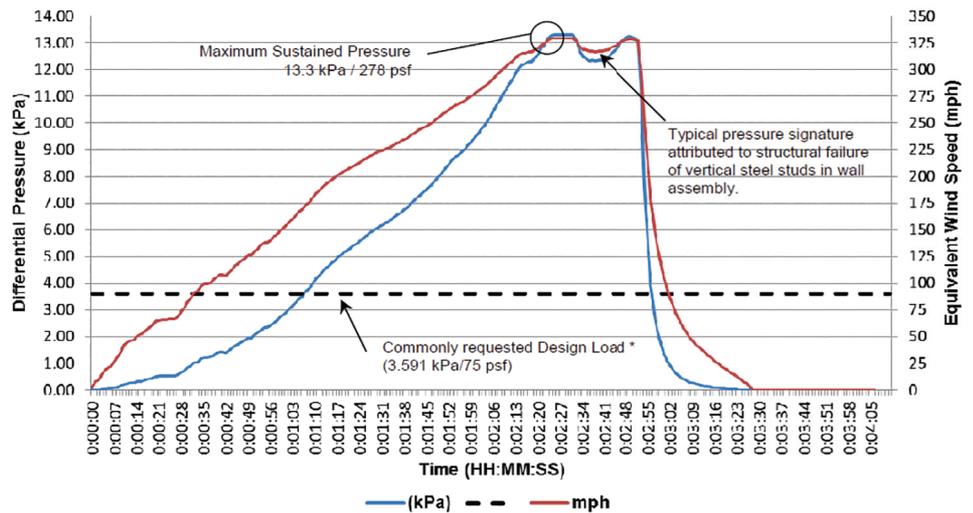
## MATERIAL SIZE AVAILABILITY

PE & FR core options with sheet material sizes  
W 50" | 62" L up to 196" T 4mm | 6mm

EVO™ Architectural Panel System (U.S. Pat. Pending)

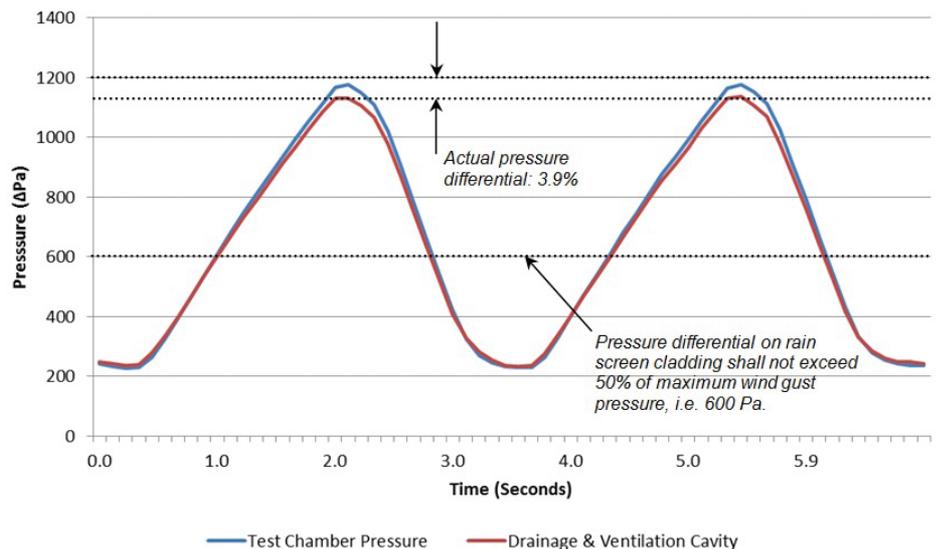
## DIFFERENTIAL PRESSURE & EQUIVALENT WIND SPEED VS. TIME (Loading to failure in the Negative Wind Load Direction)

Exova Specimen No: 15-06-M0134 | EVO™ RIVETLESS™



## AAMA 508-07 - PRESSURE EQUALIZATION BEHAVIOR

Exova Specimen No: 14-06-M0187-B | EVO™ RIVETLESS™



EVOEXOTIC<sup>+</sup>

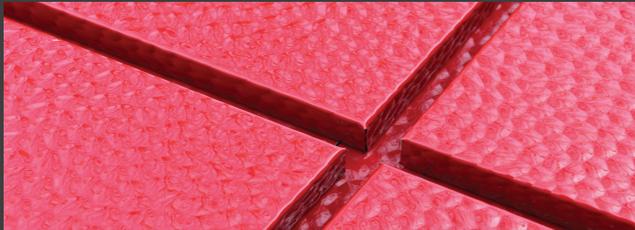
ZERO  
RIVETS

EVOPURE<sup>+</sup>

ZERO  
RIVETS

# CHANGING THE STANDARD BY DESIGN

## GUIDING PRINCIPLES BEHIND OUR EVO™ RIVETLESS™ SYSTEM



“Companies that do not practice Smart Lean Manufacturing are doomed to mediocrity & ultimately failure.”

J. LIKER



“For you to sleep well at night, the aesthetic, the quality, has to be carried all the way through.”

STEVE JOBS

“Design is not what it looks like and feels like. Design is how it works.”

STEVE JOBS



“Good design is nothing less than the translation of functional specifications. When it expresses & supports functionality, design becomes a selling point.”

EUGENE GASSMANN



Time savings through implementing Lean Manufacturing practices can result in: cost savings, cost avoidance, and indirect savings, benefiting project outcome measurably.

  
Rainscreen Panel Systems  
**KANALCO LTD.**

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