

# GEOLAM, INC TEST REPORT

**SCOPE OF WORK**

ASTM E1886 AND ASTM E1996 TESTING ON VERTIGO 5010, CLADDING

**REPORT NUMBER**

L4108.01-109-36

**TEST DATE(S)**

09/16/20 - 09/18/20

**ISSUE DATE**

02/24/21

**RECORD RETENTION END DATE**

09/18/24

**PAGES**

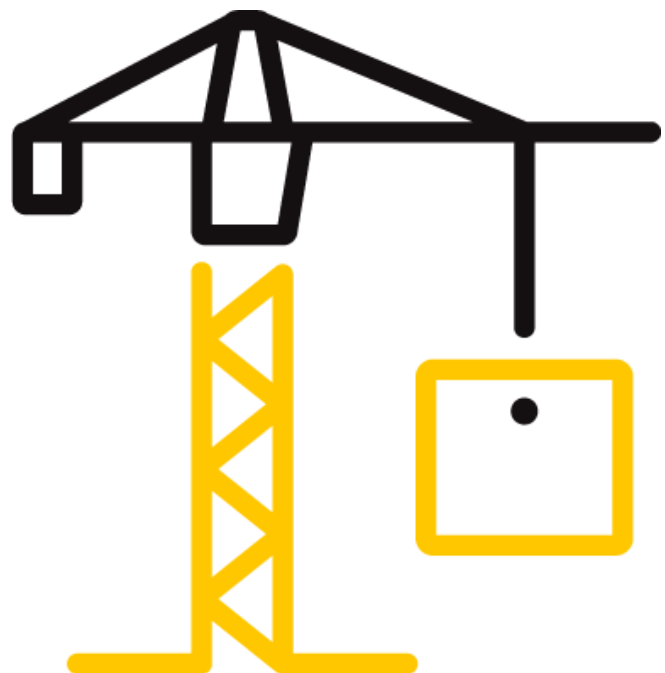
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**DOCUMENT CONTROL NUMBER**

ATI 00498 (07/23/17)

RT-R-AMER-Test-2806

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## TEST REPORT FOR GEOLAM, INC

Report No.: L4108.01-109-36

Date: 02/24/21

### REPORT ISSUED TO

#### GEOLAM INC

9 Shorncliffe Avenue  
Toronto, Ontario M4V 1S9  
CANADA

### SECTION 1

#### SCOPE

Intertek Building & Construction (B&C) was contracted by Geolam, Inc. to perform testing in general accordance with ASTM E1886 and ASTM E1996 on their Vertigo 5010, cladding. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek B&C test facility in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

|                      |                                 |                     |                           |
|----------------------|---------------------------------|---------------------|---------------------------|
| <b>COMPLETED BY:</b> | Andrew P. Mehalick              | <b>REVIEWED BY:</b> | Timothy J. McGill         |
| <b>TITLE:</b>        | Technician –<br>Product Testing | <b>TITLE:</b>       | Manager – Product Testing |
| <b>SIGNATURE:</b>    |                                 | <b>SIGNATURE:</b>   |                           |
| <b>DATE:</b>         | 02/24/21                        | <b>DATE:</b>        | 02/24/21                  |

APM:nls

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### SECTION 2

#### TEST METHOD(S)

The specimen was evaluated in general accordance with the following:

**ASTM E1886-19**, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*

**ASTM E1996-17**, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

Only one specimen was tested, not one set of three specimens.

### SECTION 3

#### MATERIAL SOURCE/INSTALLATION

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

The test specimen consisted of four courses of material. The test specimen was installed into a test buck measuring 72" wide by 26-1/4" high constructed of Spruce-Pine-Fir nominal 2x6 lumber. The studs were spaced 16" on center and were attached to the top and bottom plates with 3" long drywall screws. The studs were reinforced at each end using 2" by 2" angle secured in place using #10 x 1-1/2" pan head screws. A 2 mil thick plastic film was loosely draped over the studs to enable attainment of pressure. The test buck was not sheathed.

| LOCATION                  | ANCHOR DESCRIPTION         | ANCHOR LOCATION   |
|---------------------------|----------------------------|---|
| Bottom edge of each panel | #10 x 3/4" pan head screws | Located along the bottom edge of each panel, one screw per stud location. |

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

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### SECTION 4 EQUIPMENT

Cannon: Constructed from steel piping utilizing compressed air to propel the missile

Missile: 2x4 Southern Pine

Timing Device: Electronic Beam Type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device

Deflection Measuring Device: Linear transducers

Weather Station: 63316

Tape Measure Verification: 63788

### SECTION 5 LIST OF OFFICIAL OBSERVERS

| NAME               | COMPANY      |
|--------------------|--------------|
| Timothy J. McGill  | Intertek B&C |
| Andrew P. Mehalick | Intertek B&C |

### SECTION 6 TEST SPECIMEN DESCRIPTION

**Product Type:** Cladding

**Series/Model:** Vertigo 5010

#### Product Size(s):

| OVERALL AREA:<br>1.2 m <sup>2</sup> (13.1 ft <sup>2</sup> ) | WIDTH       |        | HEIGHT      |        |
|---|-------------|--------|-------------|--------|
|   | millimeters | inches | millimeters | inches |
| Overall size  | 1829        | 72     | 667         | 26-1/4 |
| Panel size  | 1829        | 72     | 187         | 7-3/8  |

**Panel Construction:** The panels were made from an extruded aluminum anodized alloy A6063S-T5 core. The core measured 0.0680" thick. The exterior exposed surface of each panel was made from a 0.0520" thick wood composite that was adhered to the aluminum core.

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### SECTION 7

#### TEST RESULTS

The temperature range during testing was 18°C - 24°C (65°F - 76°F). The results are tabulated as follows:

#### ASTM E1886, LARGE MISSILE IMPACTS

**Conditioning Temperature:** 24°C (76°F)

**Missile Weight:** 4191 g (9.24 lbs)

**Missile Length:** 2.5 m (8' 4")

**Muzzle Distance from Test Specimen:** 5.2 m (17' 0")

**Test Specimen #1:** Orientation within ±5° of horizontal

|                         |   |
|-------------------------|---|
| <b>IMPACT</b>           | <b>#1</b>   |
| <b>MISSILE VELOCITY</b> | 15.3 m/s (50.3 fps)   |
| <b>IMPACT AREA</b>      | Center of specimen  |
| <b>OBSERVATIONS</b>     | Missile hit target area, cracked skin at stud 8" to the left of the impact location and at impact location. No missile penetration of the panels. |
| <b>RESULTS</b>          | Pass  |

**Test Specimen #1:** Orientation within ±5° of horizontal

|                         |  |
|-------------------------|--|
| <b>IMPACT</b>           | <b>#2</b>  |
| <b>MISSILE VELOCITY</b> | 15.4 m/s (50.4 fps)  |
| <b>IMPACT AREA</b>      | Center of specimen at stud location  |
| <b>OBSERVATIONS</b>     | Missile hit target area, deformed and cracked skin of panel, no missile penetration of panel |
| <b>RESULTS</b>          | Pass   |

**Test Specimen #1:** Orientation within ±5° of horizontal

|                         |   |
|-------------------------|---|
| <b>IMPACT</b>           | <b>#3</b>   |
| <b>MISSILE VELOCITY</b> | 15.4 m/s (50.5 fps)   |
| <b>IMPACT AREA</b>      | Bottom left corner of specimen, 6" from stud  |
| <b>OBSERVATIONS</b>     | Missile hit target area, deformed and tore the panel. Tear was 1" long by 1/16" wide. The missile was rejected upon impact. |
| <b>RESULTS</b>          | Pass  |

**Note:** See Intertek B&C Sketch #1 for impact locations.

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**ASTM E1886, AIR PRESSURE CYCLING**

**Test Specimen #1:**

**Design Pressure:** ±3112 Pa (±65.0 psf)

**Positive Pressure:**

| <b>PRESSURE RANGE<br/>Pa (psf)</b> | <b>NUMBER OF CYCLES</b> | <b>AVERAGE CYCLE TIME<br/>(seconds)</b> | <b>OBSERVATIONS</b>   |
|------------------------------------|-------------------------|---|---|
| 622 to 1556<br>(13.0 to 32.5)      | 3500                    | 2.00                                    | No damage observed. No continuation of cracking or deformation of panels. |
| 0 to 1867<br>(0 to 39.0)           | 300                     | 2.22                                    | No change   |
| 1556 to 2490<br>(32.5 to 52.0)     | 600                     | 2.00                                    | No change   |
| 934 to 3112<br>(19.5 to 65.0)      | 100                     | 2.17                                    | No change   |

| <b>INDICATOR LOCATION</b> | <b>MAXIMUM DEFLECTION<br/>mm (in.)</b> | <b>PERMANENT SET<br/>mm (in.)</b> | <b>PERCENT RECOVERY</b> |                  |
|---------------------------|--|-----------------------------------|-------------------------|------------------|
|                           |  |                                   | <b>MEASURED %</b>       | <b>ALLOWED %</b> |
| 1                         | 1.8 (0.07)                             | 0.3 (0.01)                        | 86                      | > 90             |
| 2                         | 2.0 (0.08)                             | 0.3 (0.01)                        | 88                      | > 90             |
| 3                         | 1.0 (0.04)                             | <0.3 (<0.01)                      | 100                     | > 90             |
| 4                         | 2.0 (0.08)                             | 0.3 (0.01)                        | 88                      | > 90             |
| 5                         | 2.0 (0.08)                             | 0.3 (0.01)                        | 88                      | > 90             |
| 6                         | 0.8 (0.03)                             | <0.3 (<0.01)                      | 100                     | > 90             |

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**Negative Pressure:**

| PRESSURE RANGE<br>Pa (psf)     | NUMBER OF CYCLES | AVERAGE CYCLE TIME<br>(seconds) | OBSERVATIONS  |
|--------------------------------|------------------|---------------------------------|---|
| 934 to 3112<br>(19.5 to 65.0)  | 50               | 2.23                            | No damage observed. No continuation of cracking or deformation of panels. |
| 1556 to 2490<br>(32.5 to 52.0) | 1050             | 2.00                            | No change   |
| 0.0 to 1867<br>(0.0 to 39.0)   | 50               | 2.14                            | No change   |
| 622 to 1556<br>(13.0 to 32.5)  | 3350             | 2.00                            | No change   |

| INDICATOR LOCATION | MAXIMUM DEFLECTION<br>mm (in.) | PERMANENT SET<br>mm (in.) | PERCENT RECOVERY |           |
|--------------------|--------------------------------|---------------------------|------------------|-----------|
|                    |                                |                           | MEASURED %       | ALLOWED % |
| 1                  | 1.3 (0.05)                     | 0.3 (0.01)                | 80               | > 90      |
| 2                  | 4.3 (0.17)                     | 0.3 (0.01)                | 94               | > 90      |
| 3                  | 1.0 (0.04)                     | <0.3 (<0.01)              | 100              | > 90      |
| 4                  | 1.0 (0.04)                     | <0.3 (<0.01)              | 100              | > 90      |
| 5                  | 4.3 (0.17)                     | 0.3 (0.01)                | 94               | > 90      |
| 6                  | 1.0 (0.04)                     | <0.3 (<0.01)              | 100              | > 90      |

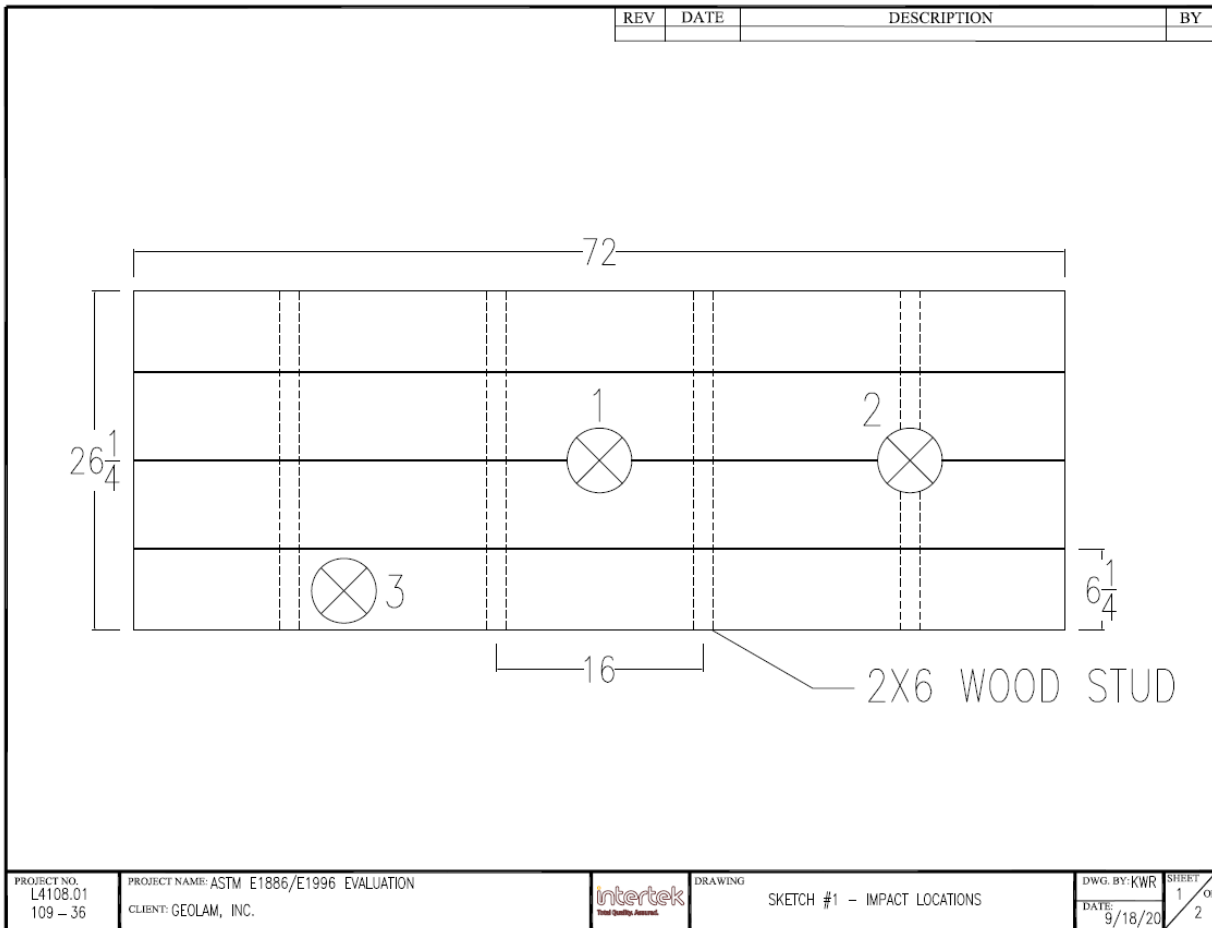
**Note:** See Intertek B&C Sketch #2 for indicator locations.

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### SECTION 8 SKETCHES

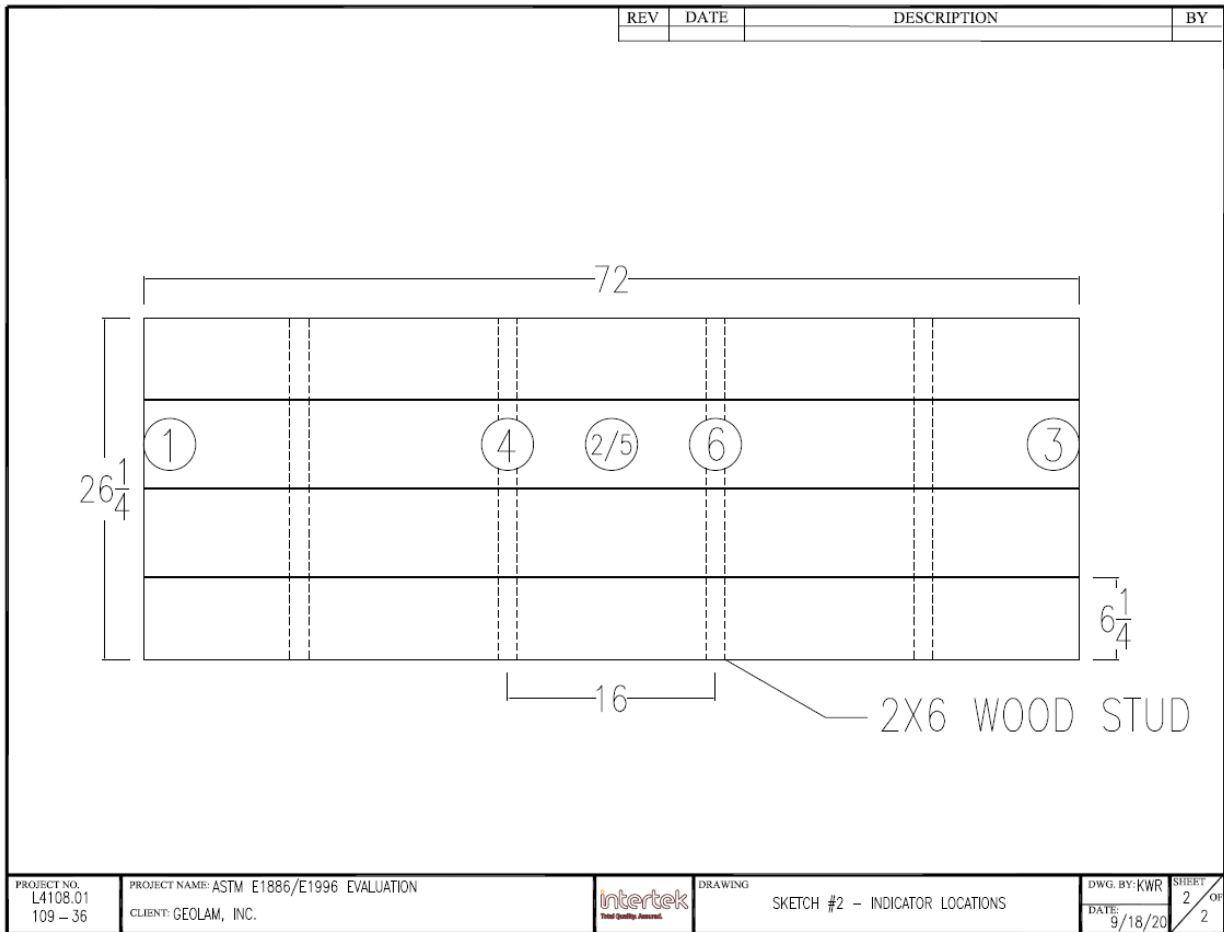




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### SECTION 9

### PHOTOGRAPH



**Photo No. 1**  
**Test Specimen Prior to Testing**



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130 Derry Court  
York, Pennsylvania 17406

Telephone: 717-764-7700  
Facsimile: 717-764-4129  
[www.intertek.com/building](http://www.intertek.com/building)

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### SECTION 10 DRAWINGS

The test specimen drawings were not supplied by the client.

### SECTION 11 REVISION LOG

| REVISION # | DATE     | PAGES | REVISION              |
|------------|----------|-------|-----------------------|
| 0          | 02/24/21 | N/A   | Original Report Issue |