



MIAMI-DADE COUNTY PERFORMANCE TEST REPORT

Report No.: G0518.01-801-44

Rendered to:

Pacific Bedrock Industrial Co. Ltd.
Flat B, 6F, Teda Building, 87 Wing Lok Street,
Sheung Wan, Hong Kong
and
TerraCore Panels, LLC
2030 Irving Blvd
Dallas, TX 75207

PRODUCT TYPE: Stone Veneer honeycomb panel
Manufactured By ALLCOMB®

SERIES/MODEL: TerraCORE panels manufactured by ALLCOMB®
Granite honeycomb panel
Marble honeycomb panel
Limestone honeycomb panel
Sandstone honeycomb panel

This report contains in its entirety:

Cover Page: 1 page
Report Body: 24 pages
Sketch(es): 2 pages
Photograph(s): 2 pages
Drawing(s): 2 pages

Test Start Date:	01/04/17
Test End Date:	04/10/17
Report Date:	04/26/17
Revision Date:	05/18/17
Test Record Retention End Date:	04/10/27
Miami-Dade County Notification No.:	ATI 10107

1.0 Client Identification:

- 1.1 Report Issued To:** Pacific Bedrock Industrial Co., Ltd.
Flat B, 6F, Teda Building, 87 Wing Lok Street,
Sheung Wan, Hong Kong
- 1.2 Contact Person:** Ron Goldsmith
- 1.3 Report Issued To:** TerraCORE Panels, LLC.
2030 Irving Blvd
Dallas, TX 75207
- 1.4 Contact Person:** Thomas Chambers

2.0 Laboratory Identification:

- 2.1 Test Laboratory:** Architectural Testing, Inc., an Intertek company ("Intertek-ATI")
1909 10th Street Suite 100
Plano, Texas 75074
- 2.2 Phone Number:** 469-814-0687

3.0 Project Summary:

- 3.1 Introduction:** Intertek-ATI was contracted by Pacific Bedrock Industrial Co. Ltd. to conduct ASTM E283, ASTM E331, ASTM E330, ASTM E1886, ASTM E1996, TAS 201, TAS 202, and TAS 203 testing in accordance with Florida Building Code for Miami-Dade County requirements. . The five specimen(s) tested met the performance requirements set forth in the protocols. The results are summarized in Table 1.

Table 1 Summary of Test Results

Specimen #	Test Protocol	Design Pressure
1	TAS 202, ASTM E283, ASTM E331, ASTM E330 TAS 201 / 203, ASTM E1996 (Large Missile)	+100 / -100psf +20psf water
2	TAS 202, ASTM E330 TAS 201 / 203, ASTM E1996 (Large Missile)	+100 / -100psf
3	TAS 202, ASTM E330 TAS 201 / 203, ASTM E1996 (Large Missile)	+100 / -100psf
4	TAS 202, ASTM E330 TAS 201 / 203, ASTM E1996 (Large Missile)	+100 / -100psf
5	TAS 202, ASTM E330 TAS 201 / 203, ASTM E1996 (Large Missile)	+100 / -100psf

3.2 Product Type: Stone Veneer honeycomb panel Manufactured By ALLCOMB®

3.3 Series/Model: TerraCORE panels manufactured by ALLCOMB®

Specimens 1-2: Limestone veneer panel

Specimen 3: Granite veneer panel

Specimen 4: Marble veneer panel

Specimen 5: Sandstone veneer panel

3.4 Miami-Dade County Notification No.: ATI 010107

3.5 Laboratory Certification No.: 12-1024.05

3.6 Test Date(s): 01/04/17 – 04/10/17

3.7 Test Record Retention End Date: 04/10/27

3.8 Test Location: Intertek-ATI test facility in Plano, Texas.

3.0 Project Summary: (Continued)

3.9 Test Specimen Source: The test specimen(s) were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek-ATI for a minimum of ten years from the test completion date.

3.10 Drawing Reference: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek-ATI per the drawings located in Appendix B. Any deviations are documented herein and on the drawings.

3.11 List of Official Observers:

<u>Name</u>	<u>Company</u>
Andy Cost	Intertek-ATI
James Huff	Intertek-ATI

4.0 Test Protocol(s):

TAS 201-94, *Impact Test Procedures*

TAS 202-94, *Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure*

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*

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

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

ASTM E331-00 (2009), *Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E1886-13a, *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 E1996-14a, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

5.0 Test Specimen Description:

5.1 Product Sizes: Table 2 provides product sizes for the overall test specimen(s) and operable components.

Table 2 Overall Specimen and Operable Component Sizes

Overall Area: 96 ft ²	Width (in.)	Height (in.)
Specimen 1 Overall size	144	96
Specimen 1 Horizontal Panels (x2)	96	48
Specimen 1 Vertical Panel	48	96
Specimen 2 Horizontal Panel	96	48
Specimen 3 Horizontal Panel	96	48
Specimen 4 Horizontal Panel	96	48
Specimen 5 Horizontal Panel	96	48

5.2 Member Details:

5.2.1 Framing Construction: The test frame was fabricated utilizing the members listed in Table 3.

Table 3 Frame Member Details

Frame Member	Part #	Material	Description
Vertical Studs	600S162-54	0.054" Thick Galvanized Steel	Located 6" from each end and 24" on center thereafter
Horizontal Tracks	600T125-54	0.054" Thick Galvanized Steel	At top and bottom

5.2.2 Text Frame Joint Construction: The test frame joints were constructed as described in Table 4.

Table 4 Frame Joint Construction Details

Location	Joinery Type	Details
All Joints	#8 x 1" self-tapping	The studs were secured to the tracks with one #8 x 1" self-tapping screw at the interior and at the exterior at both ends (4 total)

5.0 Test Specimen Description: (Continued)

5.2.3 Panel Construction: The panel was fabricated utilizing the members listed in Table 5.

Table 5 Panel Member Details

Panel Member	Part #	Material	Description
Specimen 1, 2	Veneer	Limestone	¼" thick veneer
Specimen 3	Veneer	Granite	¼" thick veneer
Specimen 4	Veneer	Marble	¼" thick veneer
Specimen 5	Veneer	Sandstone	¼" thick veneer
All Specimens	Veneer Backing	Fiberglass	0.030" thick
All Specimens	Honeycomb	Aluminum	0.645" thick
All Specimens	Honeycomb Backing	Aluminum	0.050" thick
All Specimens	Clip	Aluminum	0.138" thick

5.2.4 Panel Construction: The panel consisted of a natural stone veneer secured with adhesive to a fiberglass intermediate layer which was secured with adhesive to an aluminum honeycomb core. This honeycomb core is also adhered to an aluminum backing plate. Mounting anchors were secured to the backing plates with four 0.185" diameter rivets. A 1/8" wide vertical and horizontal joint was incorporated into specimen 1. The sealant joint consisted of backer rod and Fuller Firesound sealant.

5.3 Installation: Table 6 provides details of the test specimen installation into the LVL test buck. The rough opening allowed for a 1/2" shim space. The exterior perimeter of the test specimen was sealed to the buck with silicone sealant.

Table 6 Installation Details

Location	Anchor Description	Anchor Location
Steel Stud Wall	Anchor rail secured to the stud wall with two 1/4"x2" self-tapping screws at each stud.	4-1/4", 19-5/8", and 45-1/2" from the bottom of each panel
Panel backing	Anchor clip secured to the panel backing with four 0.185" Diameter rivets at each location.	1-5/8", 21-9/16", and 42-7/8" from the top of each panel. Located 4-1/2" and 29" from each end.

6.0 Test Results: The temperature during TAS 202 testing was 70°F. Results are tabulated as follows:

6.1 Protocol TAS 202-94, Static Air Pressure

Table 7 7 provides the results for the air infiltration test.

Specimen 1: Limestone 12x8

Table 7 Test Specimen #1 ASTM E283, TAS 202, Air Infiltration Test Results

Test Pressure	Results
Air Infiltration at 1.57 psf (25 mph)	< 0.01 cfm/ft ²
Air Infiltration at 6.24 psf (50 mph)	<0.01 cfm/ft ²

Table 8 provides the results for positive and negative uniform static load test at a duration of 30 seconds.

Specimen 1

Table 8 Test Specimen #1 ASTM E330, TAS 202, Preload and Design Load Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+75.0 50% of Test Pressure	1	0.28	N/A	0.02	N/A
	2	0.42	N/A	0.03	N/A
	3	0.13	N/A	0.01	N/A
+100.0 Design Pressure	1	0.35	N/A	0.04	N/A
	2	0.50	N/A	0.05	N/A
	3	0.16	N/A	0.02	N/A
-75.0 50% of Test Pressure	1	0.43	N/A	0.21	N/A
	2	0.58	N/A	0.18	N/A
	3	0.28	N/A	0.12	N/A
-100.0 Design Pressure	1	0.52	N/A	0.24	N/A
	2	0.75	N/A	0.21	N/A
	3	0.40	N/A	0.14	N/A

6.0 Test Results: (Continued)

6.1 Protocol TAS 202-94, *Static Air Pressure*

Table 9 provides the results for the water penetration test.

Specimen 1

Table 9 Test Specimen #1 ASTM E331, TAS 202, Water Penetration Test Results

Title of Test	Pressure	Results
Water Penetration 15% of Positive Design Pressure	20.00 psf	Pass

Table 10 provides the results for the structural overload test.

Specimen 1

Table 10 Test Specimen #1 ASTM E330, TAS 202, Structural Overload Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+150.0 Test Pressure	1	0.44	N/A	0.07	N/A
	2	0.64	N/A	0.08	N/A
	3	0.23	N/A	0.03	N/A
-150.0 Test Pressure	1	0.64	N/A	0.31	N/A
	2	1.01	N/A	0.28	N/A
	3	0.72	N/A	0.22	N/A

6.0 Test Results: (Continued)

Specimen 2: Limestone 8x4

Table 11 Test Specimen #2 ASTM E330, TAS 202, Preload and Design Load Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+75.0 50% of Test Pressure	1	0.16	N/A	0.01	N/A
	2	0.19	N/A	0.01	N/A
	3	0.23	N/A	0.02	N/A
+100.0 Design Pressure	1	0.19	N/A	0.02	N/A
	2	0.24	N/A	0.02	N/A
	3	0.28	N/A	0.03	N/A
-75.0 50% of Test Pressure	1	0.14	N/A	0.02	N/A
	2	0.18	N/A	0.01	N/A
	3	0.19	N/A	0.01	N/A
-100.0 Design Pressure	1	0.20	N/A	0.03	N/A
	2	0.28	N/A	0.03	N/A
	3	0.25	N/A	0.03	N/A
+150.0 Test Pressure	1	0.24	N/A	0.03	N/A
	2	0.33	N/A	0.02	N/A
	3	0.36	N/A	0.04	N/A
-150.0 Test Pressure	1	0.38	N/A	0.06	N/A
	2	0.44	N/A	0.06	N/A
	3	0.40	N/A	0.05	N/A

6.0 Test Results: (Continued)

Specimen 3: Granite 8x4

Table 12 Test Specimen #3 ASTM E330, TAS 202, Preload and Design Load Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+75.0 50% of Test Pressure	1	0.16	N/A	0.02	N/A
	2	0.20	N/A	0.02	N/A
	3	0.12	N/A	0.01	N/A
+100.0 Design Pressure	1	0.21	N/A	0.04	N/A
	2	0.23	N/A	0.03	N/A
	3	0.14	N/A	0.02	N/A
-75.0 50% of Test Pressure	1	0.14	N/A	0.01	N/A
	2	0.16	N/A	0.01	N/A
	3	0.10	N/A	0.01	N/A
-100.0 Design Pressure	1	0.18	N/A	0.01	N/A
	2	0.20	N/A	0.01	N/A
	3	0.12	N/A	0.01	N/A
+150.0 Test Pressure	1	0.27	N/A	0.06	N/A
	2	0.31	N/A	0.06	N/A
	3	0.20	N/A	0.04	N/A
-150.0 Test Pressure	1	0.20	N/A	0.01	N/A
	2	0.22	N/A	0.01	N/A
	3	0.12	N/A	0.01	N/A

6.0 Test Results: (Continued)

Specimen 4: Marble 8x4

Table 13 Test Specimen #4 ASTM E330, TAS 202, Preload and Design Load Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+75.0 50% of Test Pressure	1	0.18	N/A	0.01	N/A
	2	0.18	N/A	0.01	N/A
	3	0.10	N/A	0.01	N/A
+100.0 Design Pressure	1	0.22	N/A	0.02	N/A
	2	0.22	N/A	0.02	N/A
	3	0.12	N/A	0.02	N/A
-75.0 50% of Test Pressure	1	0.18	N/A	0.01	N/A
	2	0.18	N/A	0.01	N/A
	3	0.12	N/A	0.01	N/A
-100.0 Design Pressure	1	0.23	N/A	0.01	N/A
	2	0.23	N/A	0.01	N/A
	3	0.16	N/A	0.01	N/A
+150.0 Test Pressure	1	0.31	N/A	0.04	N/A
	2	0.32	N/A	0.04	N/A
	3	0.20	N/A	0.03	N/A
-150.0 Test Pressure	1	0.28	N/A	0.02	N/A
	2	0.28	N/A	0.02	N/A
	3	0.22	N/A	0.01	N/A

6.0 Test Results: (Continued)

Specimen 5: Sandstone 8x4

Table 14 Test Specimen #5 ASTM E330, TAS 202, Preload and Design Load Test Results

Load (psf)	Indicator Location	Deflection (in.)		Permanent Set (in.)	
		Measured	Allowed	Measured	Allowed
+75.0 50% of Test Pressure	1	0.08	N/A	0.01	N/A
	2	0.19	N/A	0.02	N/A
	3	0.19	N/A	0.03	N/A
+100.0 Design Pressure	1	0.10	N/A	0.01	N/A
	2	0.22	N/A	0.03	N/A
	3	0.22	N/A	0.04	N/A
-75.0 50% of Test Pressure	1	0.09	N/A	0.01	N/A
	2	0.19	N/A	0.02	N/A
	3	0.20	N/A	0.04	N/A
-100.0 Design Pressure	1	0.11	N/A	0.01	N/A
	2	0.24	N/A	0.04	N/A
	3	0.25	N/A	0.05	N/A
+150.0 Test Pressure	1	0.22	N/A	0.02	N/A
	2	0.30	N/A	0.04	N/A
	3	0.31	N/A	0.06	N/A
-150.0 Test Pressure	1	0.16	N/A	0.01	N/A
	2	0.32	N/A	0.04	N/A
	3	0.32	N/A	0.05	N/A

Note: See Intertek-ATI Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

Conclusion: Intertek-ATI observed no signs of failure in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202.

6.0 Test Results: (Continued)

6.2 Protocol TAS 201-94, Large Missile Impact Procedures

Tables 15, 16, 17, 18, and 19 provide the results for the large missile impact test.

Specimen 1: Limestone 12x8

Table 15 Test Specimen #1 ASTM E1996, TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)	Pass/Fail	Comments
1	9.25	96	50	Pass	No Rupture
2	9.25	96	50	Pass	No Rupture
3	9.25	96	50	Pass	No Rupture
4	9.25	96	50	Pass	No Rupture
5	9.25	96	50	Pass	No Rupture
6	9.25	96	50	Pass	No Rupture
7	9.25	96	50	Pass	No Rupture
8	9.25	96	50	Pass	No Rupture
9	9.25	96	50	Pass	No Rupture
10	9.25	96	50	Pass	No Rupture

Specimen 2: Limestone 8x4

Table 16 Test Specimen #2 ASTM E1996, TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)	Pass/Fail	Comments
1	9.25	96	50	Pass	No Rupture
2	9.25	96	50	Pass	No Rupture
3	9.25	96	50	Pass	No Rupture

Specimen 3: Granite 8x4

Table 17 Test Specimen #3 ASTM E1996, TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)	Pass/Fail	Comments
1	9.25	96	50	Pass	No Rupture
2	9.25	96	50	Pass	No Rupture
3	9.25	96	50	Pass	No Rupture

6.0 Test Results: (Continued)

Specimen 4: Marble 8x4

Table 18 Test Specimen #4 ASTM E1996, TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)	Pass/Fail	Comments
1	9.25	96	50	Pass	No Rupture
2	9.25	96	50	Pass	No Rupture
3	9.25	96	50	Pass	No Rupture

Specimen 5: Sandstone 8x4

Table 19 Test Specimen #5 ASTM E1996, TAS 201, Large Missile Impact Test Results

Impact #	Missile Weight (lbs.)	Missile Length (in.)	Missile Velocity (ft./sec.)	Pass/Fail	Comments
1	9.25	96	50	Pass	No Rupture
2	9.25	96	50	Pass	No Rupture
3	9.25	96	50	Pass	No Rupture

Note: See Intertek-ATI Sketch #2 for impact locations.

Conclusion: The large missiles impacted each intended target and Intertek-ATI carefully inspected each impact location. Intertek-ATI observed no signs of penetration, rupture, or opening after the large missile impact test; as such, each test specimen satisfies the large missile requirements of TAS 201.

6.0 Test Results: (Continued)

6.3 Protocol TAS 203-94, Cyclic Wind Pressure Loading

Tables 20 through 4 provide the results for the positive and negative cyclic load test.

Table 20 Test Specimen #1 Limestone 12x8 ASTM E1996, Cyclic Test Spectrum and Average Cycle Time

POSITIVE PRESSURE			
Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
20.0 to 50.0	3500	2.65	No Rupture or Penetration
0 to 60.0	300	2.97	No Rupture or Penetration
50.0 to 80.0	600	2.76	No Rupture or Penetration
30.0 to 100.0	100	3.00	No Rupture or Penetration
NEGATIVE PRESSURE			
Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
30.0 to 100.0	50	3.00	No Rupture or Penetration
50.0 to 80.0	1050	3.00	No Rupture or Penetration
0 to 60.0	50	3.00	No Rupture or Penetration
20.0 to 50.0	3350	2.63	No Rupture or Penetration

Result: Pass

Table 21 Test Specimen #1 Limestone 12x8 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+100 / -100 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		2.44	2.80	1
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.94	2.20	1
Number of Cycles		600	70	1

6.0 Test Results: (Continued)

Table 22 Test Specimen #1 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.34	0.01
2	0.51	0.01
3	0.16	0.01

Table 23 Test Specimen #1 TAS 203, Negative Cyclic Load test results

Indicator Location	Maximum Deflection	Permanent Set (in.)
1	0.49	0.21
2	0.82	0.29
3	0.68	0.24

Table 24 Test Specimen #2 Limestone 8x4 ASTM E1996, Cyclic Test Spectrum and Average Cycle Time

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
20.0 to 50.0	3500	1.78	No Rupture or Penetration
0 to 60.0	300	1.92	No Rupture or Penetration
50.0 to 80.0	600	1.82	No Rupture or Penetration
30.0 to 100.0	100	2.04	No Rupture or Penetration

TABLE 25

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
30.0 to 100.0	50	2.09	No Rupture or Penetration
50.0 to 80.0	1050	1.54	No Rupture or Penetration
0 to 60.0	50	1.70	No Rupture or Penetration
20.0 to 50.0	3350	1.61	No Rupture or Penetration

Result: Pass

6.0 Test Results: (Continued)

Table 26 Test Specimen #2 Limestone 8x4 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+100 / -100 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		2.30	2.40	1
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.80	1.80	1
Number of Cycles		600	70	1

Table 27 Test Specimen #2 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.25	0.01
2	0.33	0.01
3	0.37	0.03

Table 28 Test Specimen #2 TAS 203, Negative Cyclic Load test results

Indicator Location	Maximum Deflection	Permanent Set (in.)
1	0.38	0.09
2	0.44	0.06
3	0.40	0.06

6.0 Test Results: (Continued)

Table 29 Test Specimen #3 Granite 8x4 ASTM E1996, Cyclic Test Spectrum and Average Cycle Time

POSITIVE PRESSURE			
Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
20.0 to 50.0	3500	1.78	No Rupture or Penetration
0 to 60.0	300	1.74	No Rupture or Penetration
50.0 to 80.0	600	1.99	No Rupture or Penetration
30.0 to 100.0	100	2.14	No Rupture or Penetration

TABLE 30 **NEGATIVE PRESSURE**

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
30.0 to 100.0	50	2.38	No Rupture or Penetration
50.0 to 80.0	1050	2.00	No Rupture or Penetration
0 to 60.0	50	1.79	No Rupture or Penetration
20.0 to 50.0	3350	1.70	No Rupture or Penetration

Result: Pass

Table 31 Test Specimen #3 Granite 8x4 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+100 / -100 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.78	1.74	1
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.79	2.00	1
Number of Cycles		600	70	1

6.0 Test Results: (Continued)

Table 32 Test Specimen #3 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.25	0.04
2	0.29	0.04
3	0.17	0.01

Table 33 Test Specimen #3 TAS 203, Negative Cyclic Load test results

Indicator Location	Maximum Deflection	Permanent Set (in.)
1	0.20	0.02
2	0.23	0.02
3	0.18	0.01

Table 34 Test Specimen #4 Marble 8x4 ASTM E1996, Cyclic Test Spectrum and Average Cycle Time

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
20.0 to 50.0	3500	1.84	No Rupture or Penetration
0 to 60.0	300	2.01	No Rupture or Penetration
50.0 to 80.0	600	1.70	No Rupture or Penetration
30.0 to 100.0	100	2.37	No Rupture or Penetration

TABLE 35

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
30.0 to 100.0	50	2.05	No Rupture or Penetration
50.0 to 80.0	1050	2.43	No Rupture or Penetration
0 to 60.0	50	1.76	No Rupture or Penetration
20.0 to 50.0	3350	1.89	No Rupture or Penetration

Result: Pass

6.0 Test Results: (Continued)

Table 36 Test Specimen #4 Marble 8x4 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+100 / -100 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.84	2.01	1
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.89	1.76	1
Number of Cycles		600	70	1

Table 37 Test Specimen #4 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.37	0.12
2	0.35	0.12
3	0.23	0.10

Table 38 Test Specimen #4 TAS 203, Negative Cyclic Load test results

Indicator Location	Maximum Deflection	Permanent Set (in.)
1	0.19	0.01
2	0.22	0.01
3	0.18	0.01

6.0 Test Results: (Continued)

Table 39 Test Specimen #5 Sandstone 8x4 ASTM E1996, Cyclic Test Spectrum and Average Cycle Time

POSITIVE PRESSURE			
Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
20.0 to 50.0	3500	2.16	No Rupture or Penetration
0 to 60.0	300	2.34	No Rupture or Penetration
50.0 to 80.0	600	2.19	No Rupture or Penetration
30.0 to 100.0	100	2.86	No Rupture or Penetration

TABLE 40 **NEGATIVE PRESSURE**

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Observations
30.0 to 100.0	50	2.56	No Rupture or Penetration
50.0 to 80.0	1050	1.81	No Rupture or Penetration
0 to 60.0	50	2.31	No Rupture or Penetration
20.0 to 50.0	3350	1.71	No Rupture or Penetration

Result: Pass

Table 41 Test Specimen #5 Sandstone 8x4 TAS 203, Cyclic Test Spectrum and Average Cycle Time

Design Pressure	+100 / -100 psf	Stage		
		1	2	3
Positive Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		2.16	2.39	1
Number of Cycles		600	70	1
Stage		4	5	6
Negative Pressure Range (psf)		0 – 50.0	0 – 60.0	0 – 130.0
Average Cycle Time (sec.)		1.71	2.31	1
Number of Cycles		600	70	1

6.0 Test Results: (Continued)

Table 42 Test Specimen #5 TAS 203, Positive Cyclic Load Test Results

Indicator Location	Maximum Deflection (in.)	Permanent Set (in.)
1	0.13	0.01
2	0.30	0.03
3	0.07	0.04

Table 43 Test Specimen #5 TAS 203, Negative Cyclic Load test results

Indicator Location	Maximum Deflection	Permanent Set (in.)
1	0.41	0.01
2	0.48	0.01
3	0.29	0.01

Note: See Intertek-ATI Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

Conclusion: Intertek-ATI observed no signs of failure in any area of the test specimens during the cyclic load test; as such, the test specimens satisfy the cyclic load requirements of TAS 203.

7.0 Test 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,

8.0 Laboratory Compliance Statements: The following are provided as required by the protocols for the testing reported herein.

Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1625 of the Florida Building Code, Building.

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.

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For ARCHITECTURAL TESTING, INC.:

Andy Cost
Laboratory Manager

Tyler Westerling
Engineer

AC:cm

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix A: Sketches (3)

Appendix B: Photos (4)

Appendix C: Drawings (2)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
1	05/18/17	1, 3	Changed Product Type to: Stone Veneer honeycomb panel Manufactured By ALLCOMB®
	05/18/17	1, 2	Changed Order of Renders To: to show Pacific Bedrock first. Changed Pacific Bedrock address.
	05/18/17	1, 3	Changed Series/Model to: TerraCORE panels manufactured by ALLCOMB®



Test Report No.: G0518.01-801-44

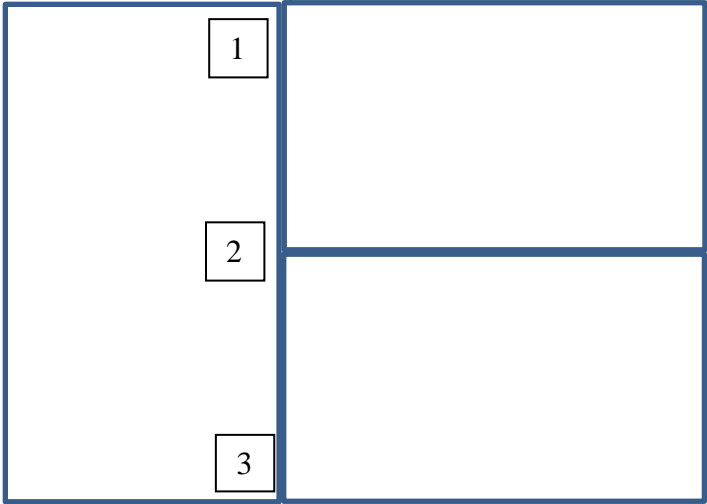
Report Date: 04/26/17

Revision 1: 05/18/17

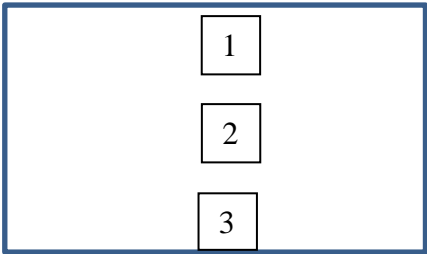
Appendix A

Sketches

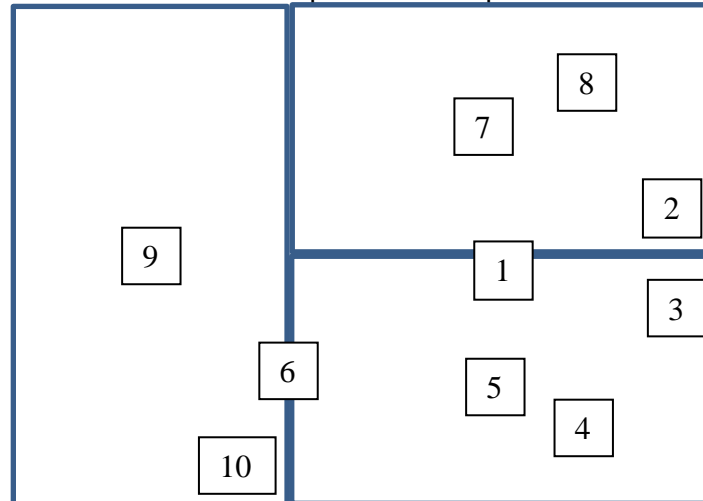
Specimen 1 Indicators



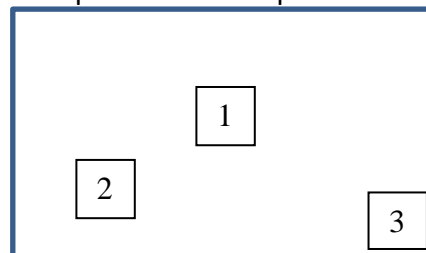
Specimen 2-5 Indicators



Specimen 1 Impacts



Specimen 2-5 Impacts





Test Report No.: G0518.01-801-44

Report Date: 04/26/17

Revision 1: 05/18/17

Appendix B

Photos



Photo 1
Specimen 1 Configuration Front



Photo 2
Specimen 1 Configuration Back

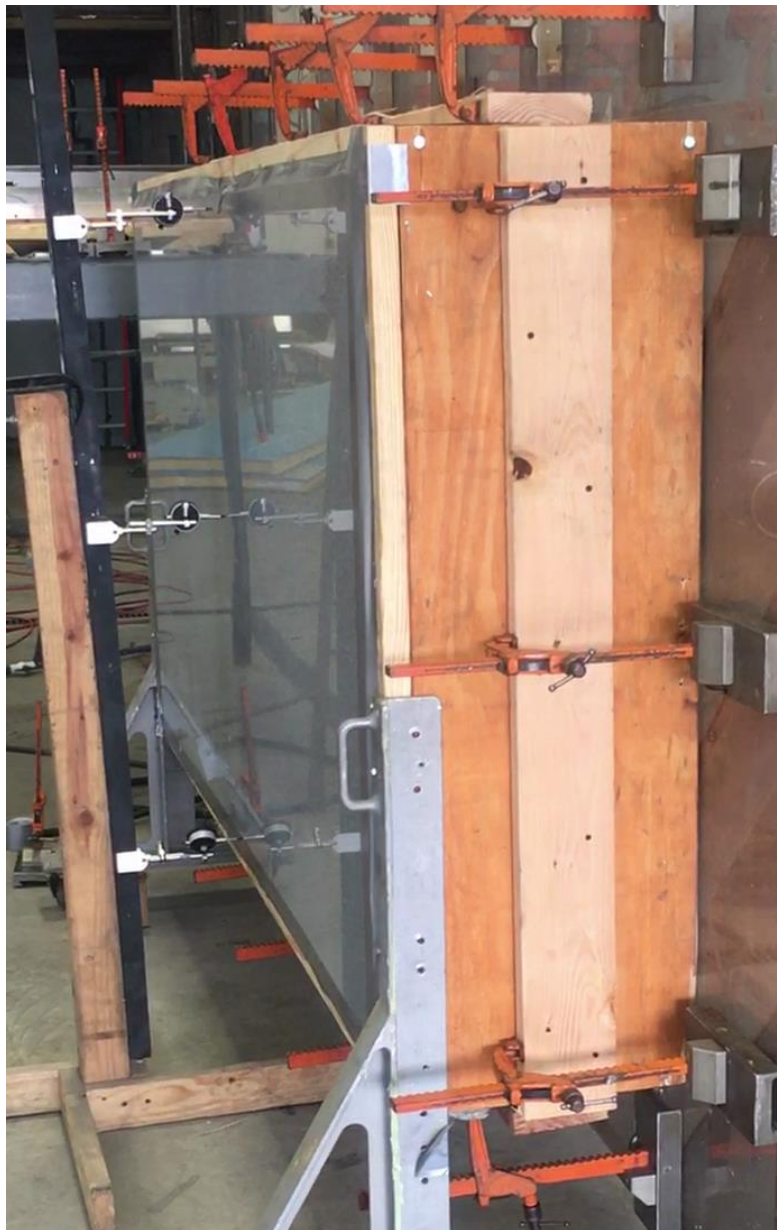


Photo 3
Specimens 2-5 configuration

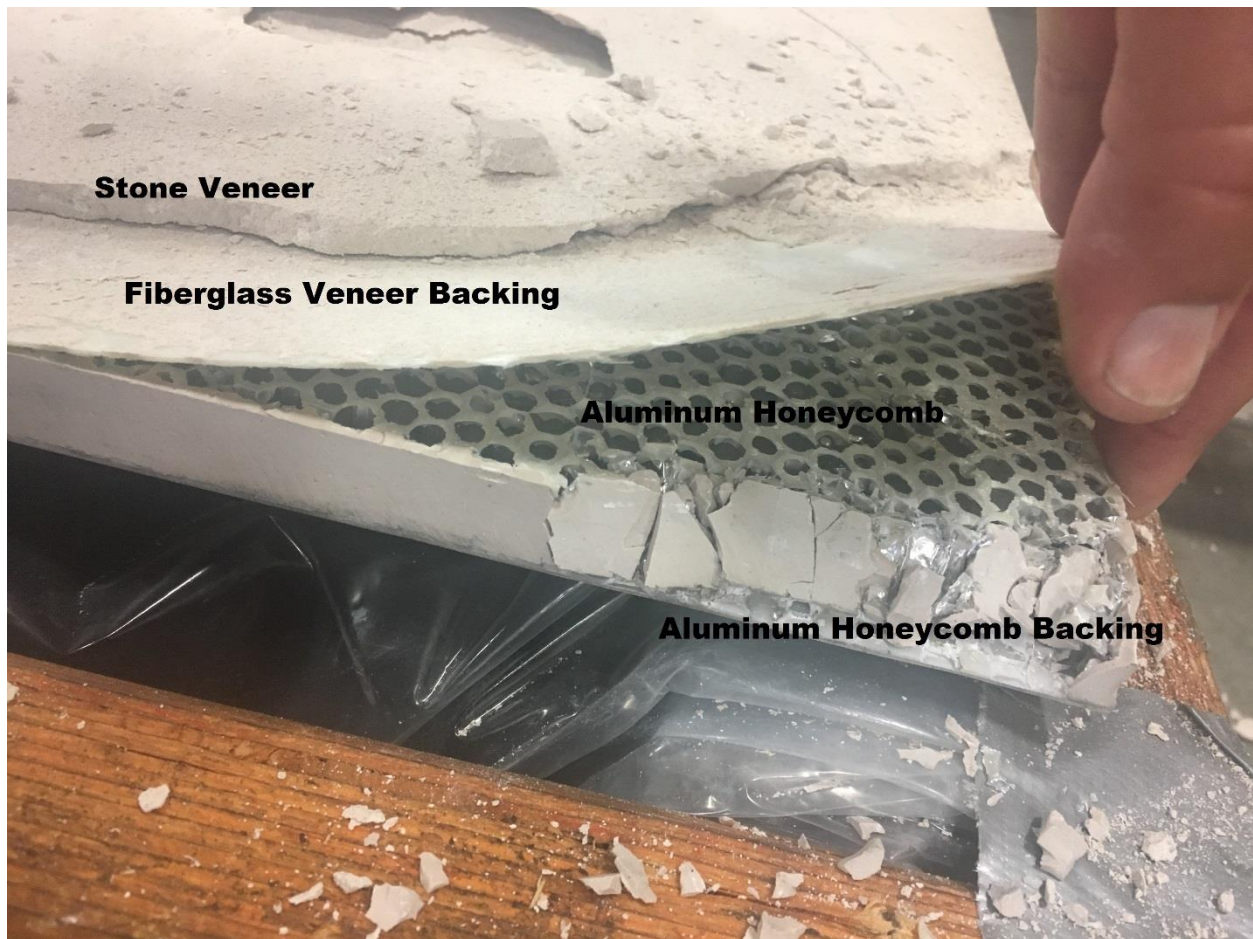


Photo 4
Panel Layers



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Revision 1: 05/18/17

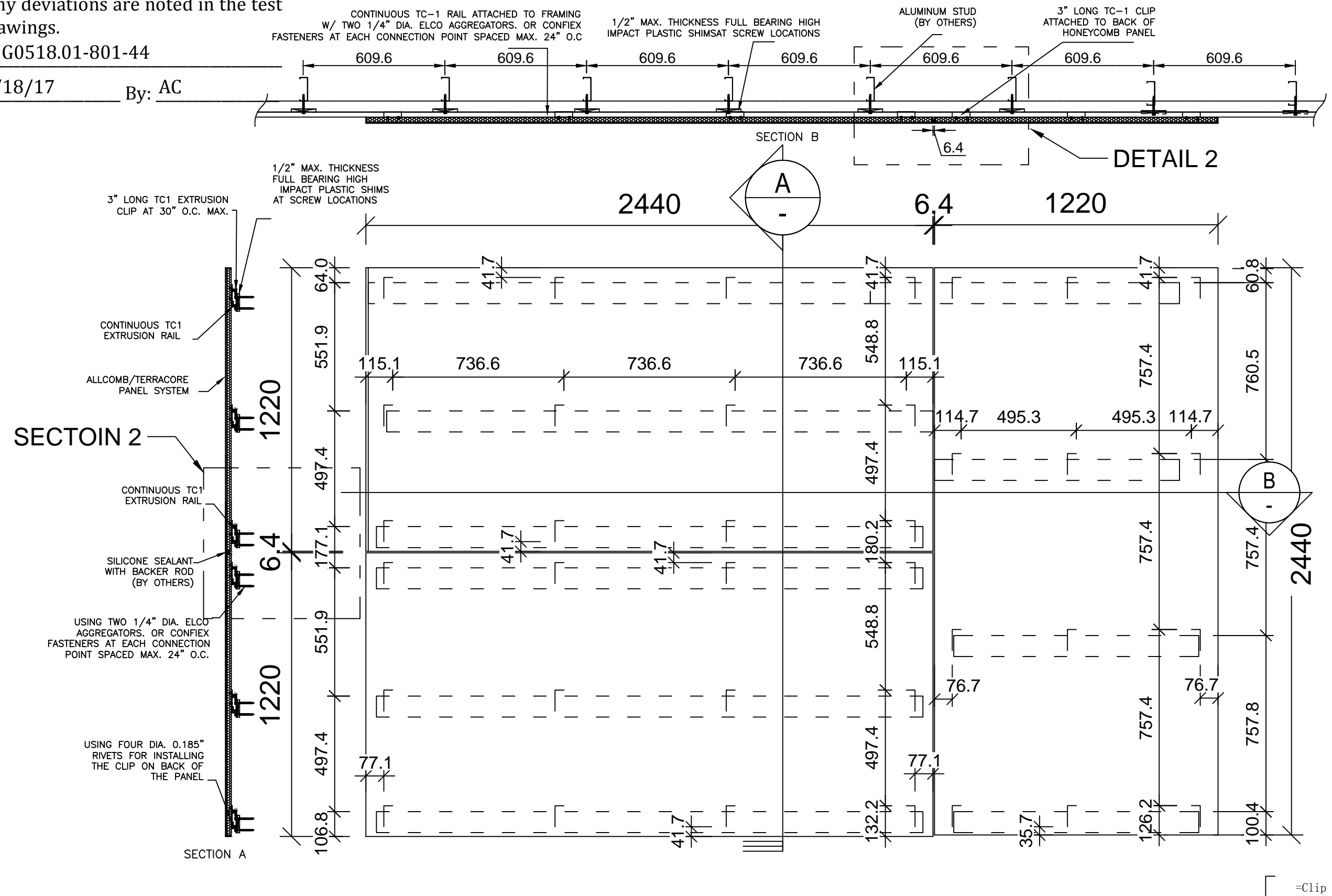
Appendix C

Drawing(s)

Test sample complies with details shown herein. Any deviations are noted in the test report drawings.

Report#: G0518.01-801-44

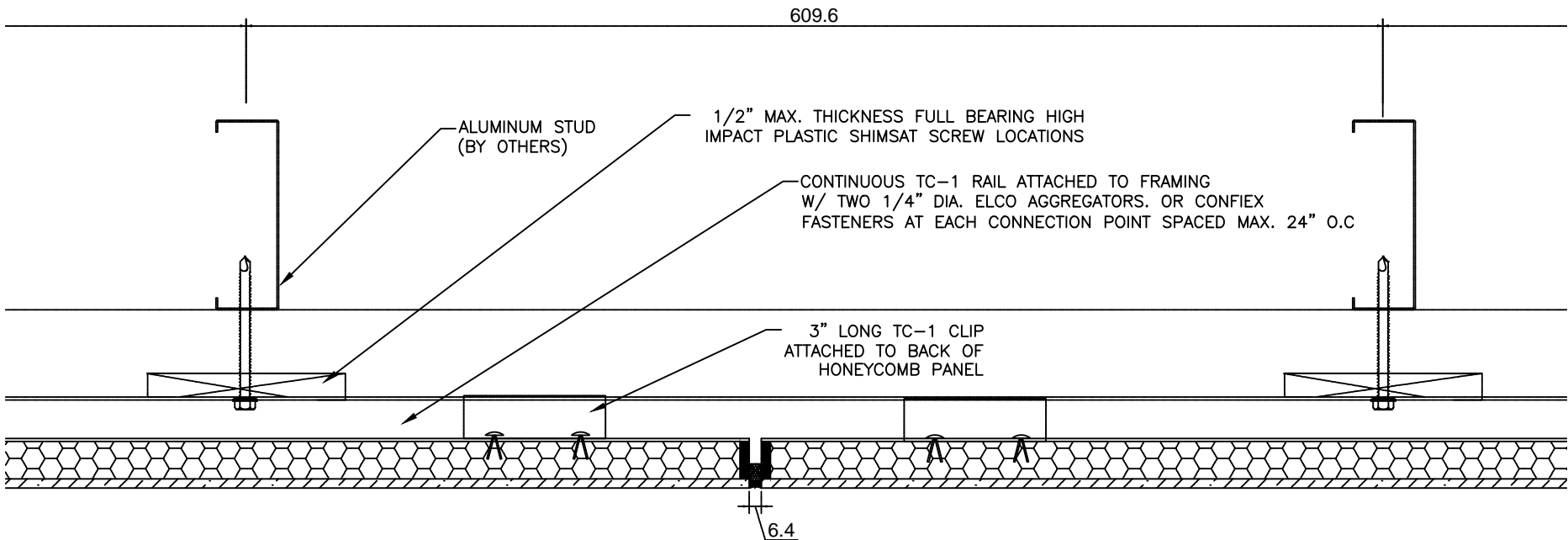
Date: 05/18/17 By: AC



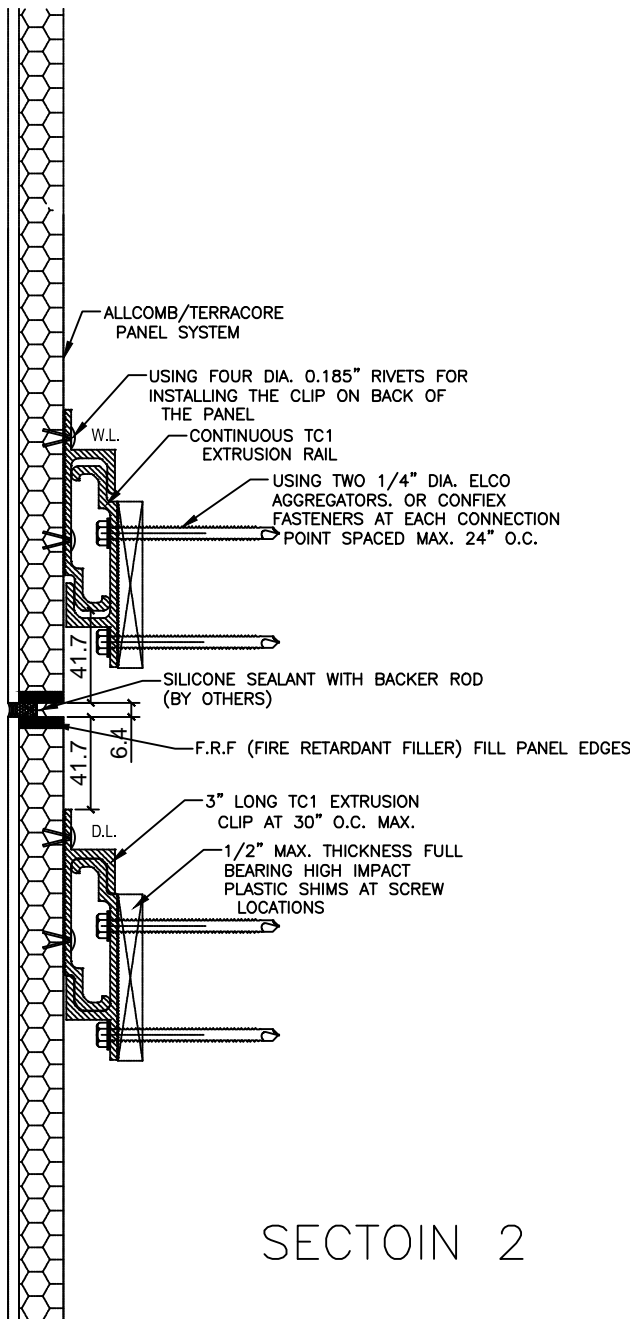
Test sample complies with details shown herein. Any deviations are noted in the test report drawings.

Report#: G0518.01-801-44

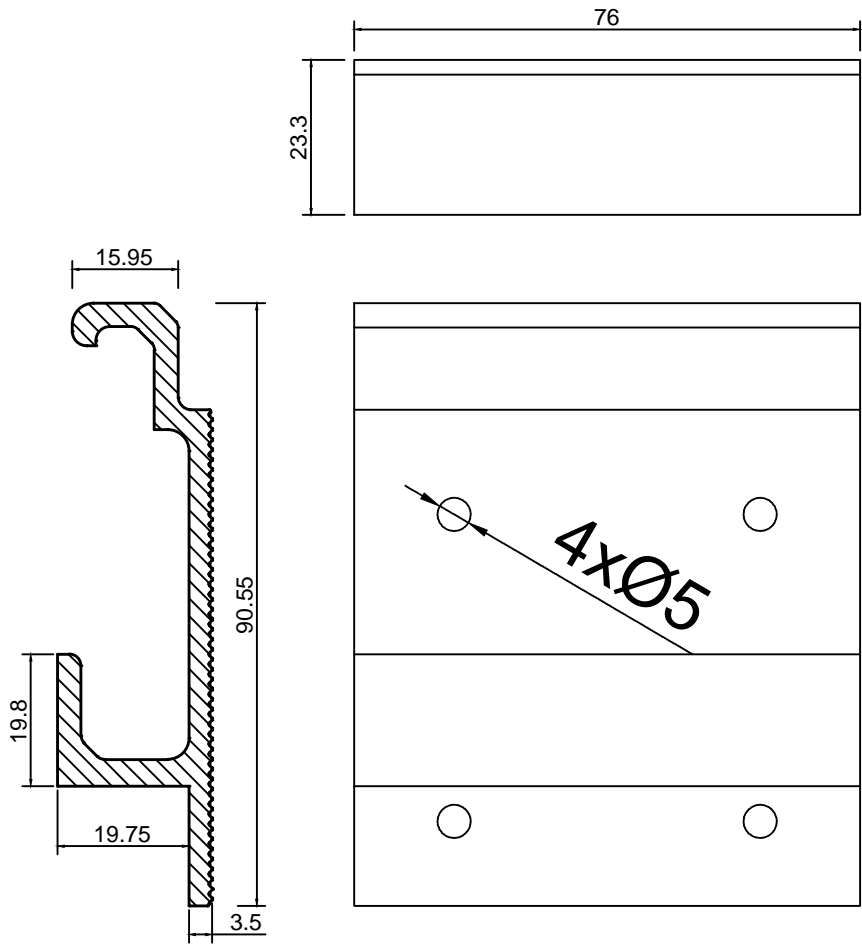
Date: 05/18/17 By: AC



DETAIL 2



SECTION 2



TC1 CLIP
SCALE 1:1

Drawing	CAN
Material	STONE HONEYCOMB PANEL
Page	P4
Date	2016-12-07
NO.	-
Project	Large Missile Test