

ARMOUR-H BUILDING BLOCKS LLC

FLORIDA BUILDING CODE TEST REPORT

SCOPE OF WORK

TAS 201, TAS 202, TAS 203, ASTM E330, ASTM E1886 AND ASTM E1996 TESTING ON
INSULATED COMPOSITE CONCRETE FORM BLOCK WALLS

REPORT NUMBER

R0892.01-450-44 R0

TEST DATE(S)

05/28/24 – 6/06/24

ISSUE DATE

06/17/24

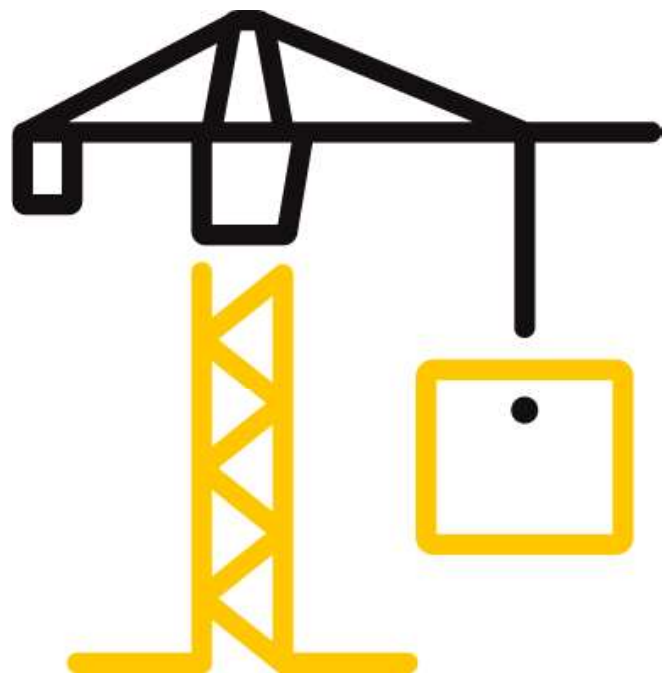
PAGES

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DOCUMENT CONTROL NUMBER

RT-R-AMER-Test-2816 (05/29/24)

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TEST REPORT FOR ARMOUR-H BUILDING BLOCKS LLC

Report No.: R0892.01-450-44 R0

Date: 06/17/24

REPORT ISSUED TO

ARMOUR-H BUILDING BLOCKS, LLC

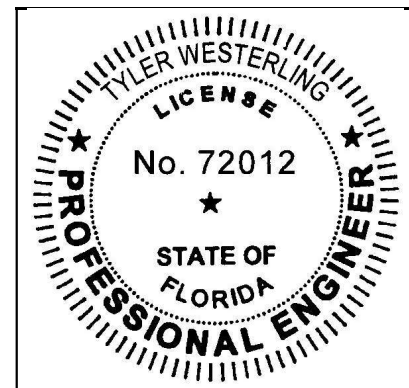
5463 Blue Heron Ln.

Wesley Chapel, FL 33543

SECTION 1

SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Armour-H Building Blocks, LLC to perform TAS 201, TAS 202, TAS 203, ASTM E330, ASTM E1886 and ASTM E1996 testing in accordance with Florida Building Code for High Velocity Hurricane Zone requirements on their Insulated Composite Concrete Form Block Walls. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at the Intertek B&C test facility in West Palm Beach, FL. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.



For INTERTEK B&C:

COMPLETED BY: Melissa Nuttall, FMPC
TITLE: Senior Project Manager
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Digitally Signed by: Melissa Nuttall
DATE: 06/17/24

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REVIEWED BY: Tyler Westerling, P.E.
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DATE: 06/17/24

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SECTION 2

SUMMARY OF TEST RESULTS

The specimen(s) tested met the performance requirements set forth in the protocols.

SPEC.	TEST PROTOCOL	DESIGN PRESSURE
1	TAS 202 – Structural Loads Only and ASTM E330	+30 / -30 psf
1-3	TAS 201/203 (Large Missile) and ASTM E1886/E1996 (Level D, Wind Zone 4)	+30 / -30 psf

SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

TAS 201-94, *Impact Test Procedures*

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

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

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 E1996-20, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

The specimens were evaluated in general accordance with the following:

TAS 202-94, *Criteria for Testing Impact & Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure*. Only structural loads were performed.

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimens were 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 specimens were installed into a steel test buck. Installation of the tested product was performed by the client.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Head, Sill, Jamb	#4 Rebar Welded to Frame	Head to Sill, 3" from each end and 18" on center Jamb to jamb, 10" from each end and 16" on center.

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SECTION 5

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: 1" dial indicators

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Seth Allen	Intertek B&C
Cesar Prieto	Intertek B&C

SECTION 7

TEST SPECIMEN DESCRIPTION

Product Type: Block Walls

Series/Model: Insulated Composite Concrete Form (ICCF)

COMPONENTS	DETAILS	ATTACHMENT METHOD
11" H-Block	The 18" wide x 11" deep x 16" high blocks are constructed from recycled expanded polystyrene (EPS) with a 6" wide x 5" deep x 10" high cement core.	The blocks were filled with grout and reinforced with #4 rebar at 18" on center vertically and 16" on center horizontally that was welded to the frame.

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SECTION 8

TEST RESULTS

Protocol TAS 202-94, Static Air Pressure

Test Date(s): 05/31/24

The temperature during testing was 92°F. The results are tabulated as follows:

Test Specimen #1: Preload and Design Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+22.0 50% of Test Pressure	2	<0.01	N/A	<0.01	N/A
	5	<0.01	N/A	<0.01	N/A
+30.0 Design Pressure	2	<0.01	0.27	<0.01	N/A
	5	<0.01	0.53	<0.01	N/A
+45.0 Test Pressure	2	<0.01	N/A	<0.01	0.10
	5	<0.01	N/A	<0.01	0.19
-22.0 50% of Test Pressure	2	<0.01	N/A	<0.01	N/A
	5	<0.01	N/A	<0.01	N/A
-30.0 Design Pressure	2	<0.01	0.27	<0.01	N/A
	5	<0.01	0.53	<0.01	N/A
-45.0 Test Pressure	2	0.01	N/A	<0.01	0.10
	5	<0.01	N/A	<0.01	0.19

Note 1: Positive and negative uniform static load test loads were held for 30 seconds.

Note 2: Tape and film were to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Note 3: See Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

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Protocol TAS 201-94, Large Missile Impact Procedures

Test Date(s): 05/28/24 through 06/05/24

The temperature during testing was 85°F - 92°F. The results are tabulated as follows:

Test Specimen #1

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.23	96.0	49.84
2			49.54
3			50.54
4			51.33

Note 4: See Sketch #2 for impact locations.

Test Specimen #2

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.24	96.0	50.76
2			50.84
3			49.97
4			50.14

Note 5: See Sketch #3 for impact locations.

Test Specimen #3

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
1	9.25	92.0	51.09
2			49.93
3			51.09
4			51.01

Note 6: See Sketch #4 for impact locations.

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Protocol TAS 203-94, Cyclic Wind Pressure Loading
Test Date(s): 05/28/24 through 06/06/24

The temperature during testing was 85°F - 92°F. The results are tabulated as follows:

Test Specimen #1: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+30.0 / -30.0 psf	1	2	3
POSITIVE PRESSURE RANGE (psf)	0 – 15.0	0 – 18.0	0 – 39.0
AVERAGE CYCLE TIME (sec.)	2.0	2.1	1.0
NUMBER OF CYCLES	600	70	1
	4	5	6
NEGATIVE PRESSURE RANGE (psf)	0 – 15.0	0 – 18.0	0 – 39.0
AVERAGE CYCLE TIME (sec.)	2.0	2.0	1.0
NUMBER OF CYCLES	600	70	1

Test Specimen #2: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+30.0 / -30.0 psf	1	2	3
POSITIVE PRESSURE RANGE (psf)	0 – 15.0	0 – 18.0	0 – 39.0
AVERAGE CYCLE TIME (sec.)	2.7	2.7	1.0
NUMBER OF CYCLES	600	70	1
	4	5	6
NEGATIVE PRESSURE RANGE (psf)	0 – 15.0	0 – 18.0	0 – 39.0
AVERAGE CYCLE TIME (sec.)	2.8	2.9	1.0
NUMBER OF CYCLES	600	70	1

Test Specimen #3: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE		
+30.0 / -30.0 psf	1	2	3
POSITIVE PRESSURE RANGE (psf)	0 – 15.0	0 – 18.0	0 – 39.0
AVERAGE CYCLE TIME (sec.)	2.4	2.5	1.0
NUMBER OF CYCLES	600	70	1
	4	5	6
NEGATIVE PRESSURE RANGE (psf)	0 – 15.0	0 – 18.0	0 – 39.0
AVERAGE CYCLE TIME (sec.)	2.5	2.5	1.0
NUMBER OF CYCLES	600	70	1

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SECTION 9**CONCLUSIONS**

The large missiles impacted each intended target. Each impact location was carefully inspected. No signs of penetration, rupture, or opening after the large missile impact test were observed; as such, each test specimen satisfies the large missile requirements of TAS 201. Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

No signs of failure were observed in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202. Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

No signs of failure were observed 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. Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1625 of the Florida Building Code, Building.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule, also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

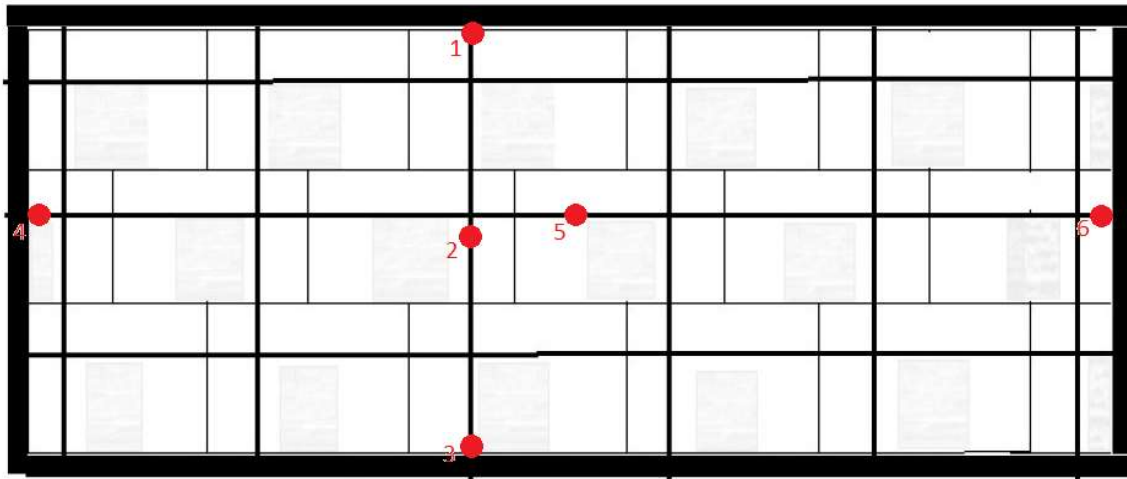
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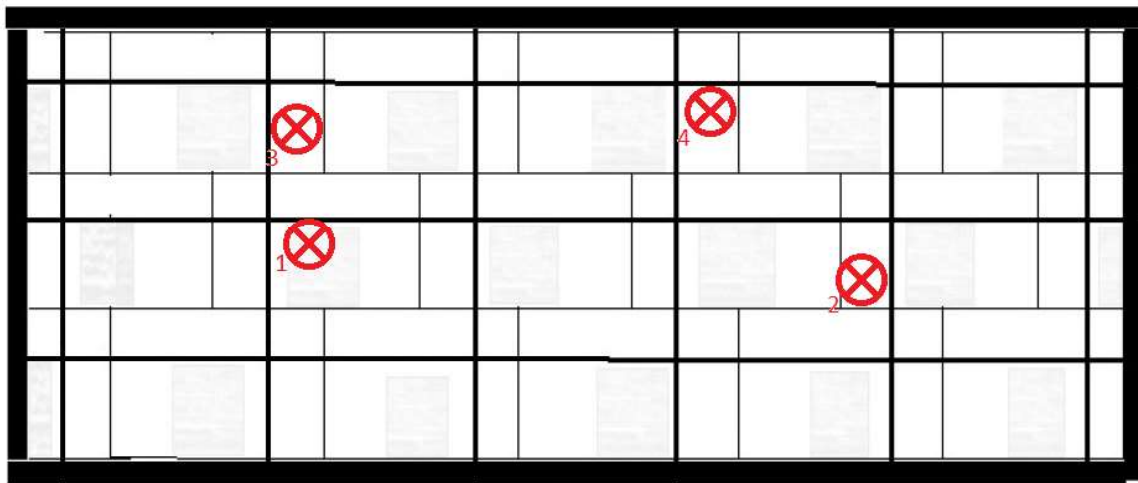
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SKETCH(ES)



Sketch No. 1
TAS 202 Indicator Locations

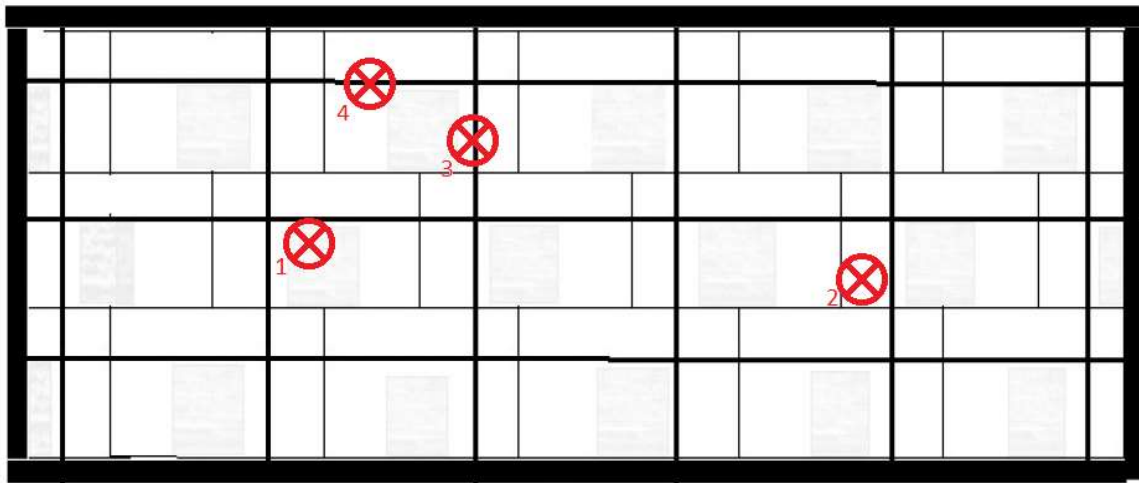


Sketch No. 2
TAS 201 Impact Locations - Specimen 1

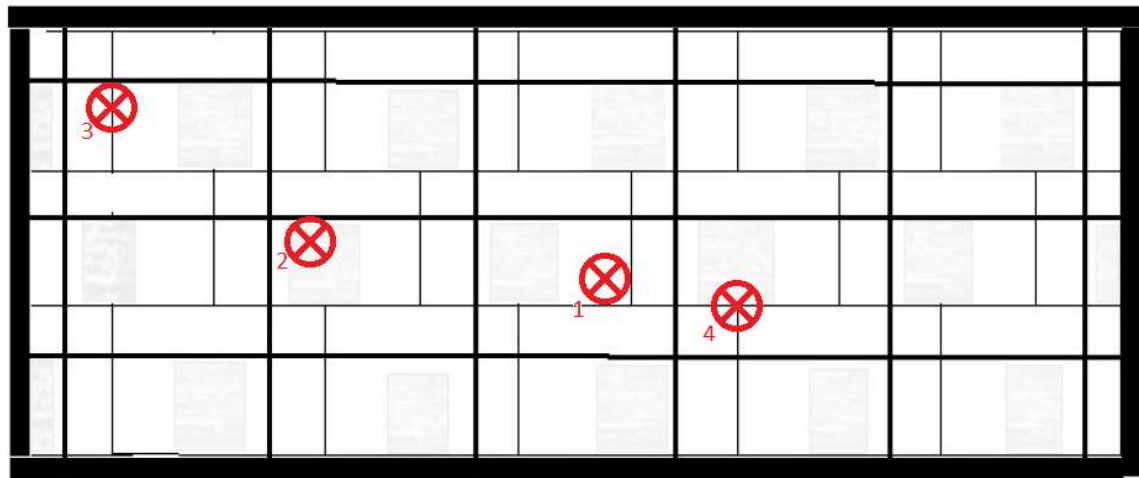
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Sketch No. 3
TAS 201 Impact Locations - Specimen 2



Sketch No. 4
TAS 201 Impact Locations - Specimen 3

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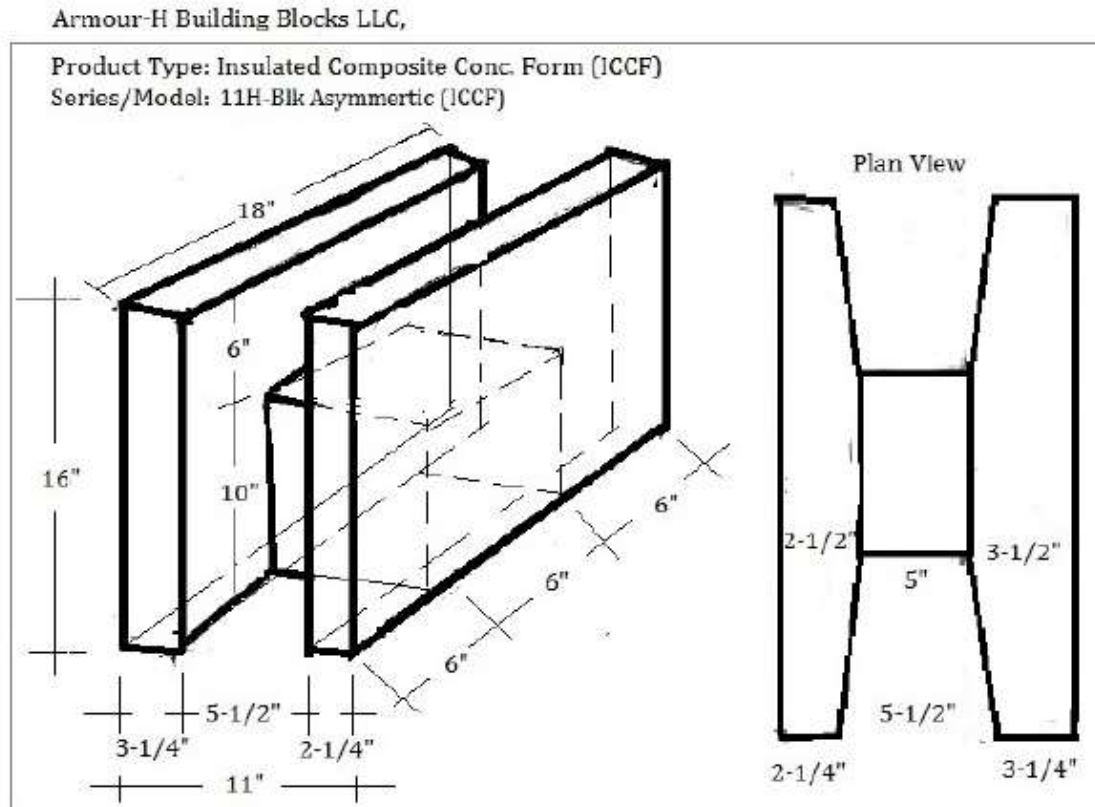
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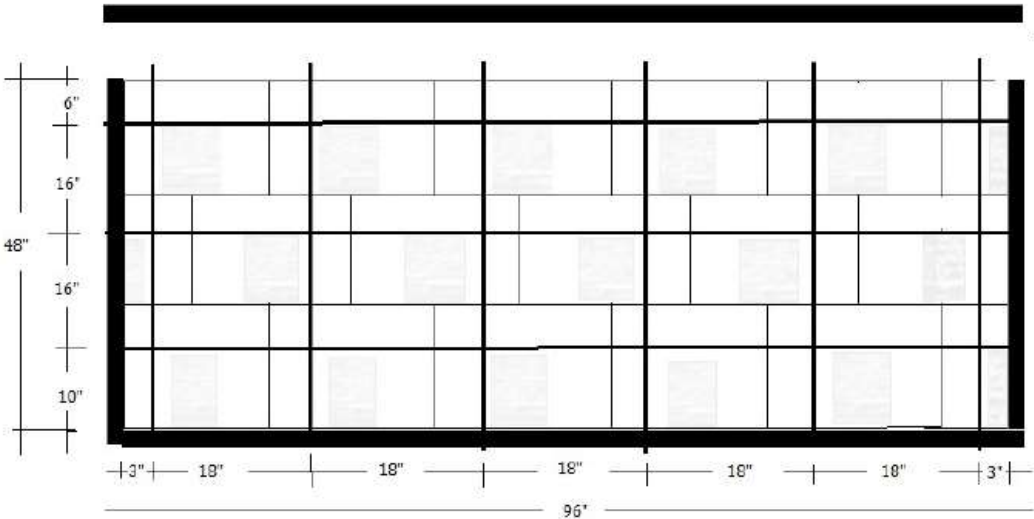
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DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



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Test Panel	Material	Description
11"H-Block	Recycled Expanded Polystyrene (EPS) and Cement	18"x16"x11"thick ICCF blocks, grout filled core, reinforced with #4 rebar at 18" O.C. vertically and #4 at 16" O.C. horizontally



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REVISION LOG

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