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ACTS CONSTRUCTION, LLC

THERMAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ICF THERMAL TESTING WALL

REPORT NUMBER
M6276.01-116-46 R0

TEST DATE
09/04/21

ISSUE DATE
10/27/21

RECORD RETENTION END DATE
09/04/26

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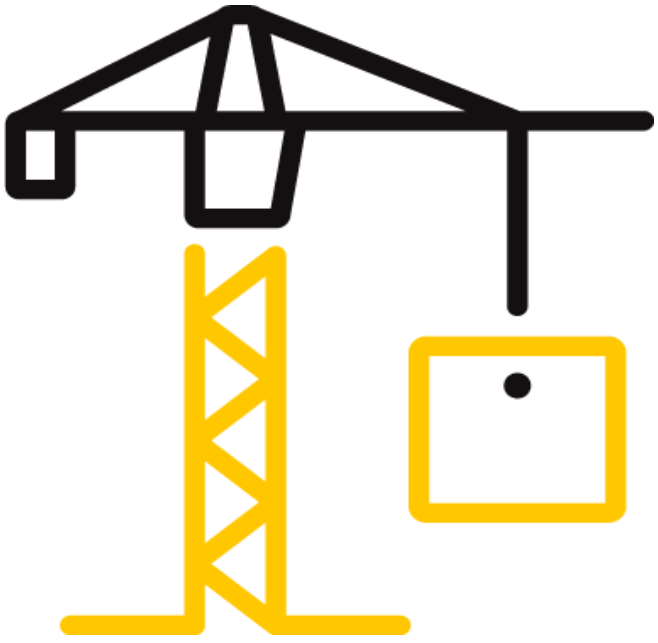

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TEST REPORT FOR ACTS CONSTRUCTION, LLC
Report No.: M6276.01-116-46 R0
Date: 10/27/21

REPORT ISSUED TO

ACTS CONSTRUCTION, LLC
7816 113th Ave.
Pleasant Prairie , Wisconsin 53158

SECTION 1

SCOPE

SERIES/MODEL: ICF Thermal Testing Wall
TYPE: Structural Concrete Insulated Panel System

Intertek Building & Construction (Intertek B&C) was contracted by Acts Construction, LLC to evaluate the thermal performance per ASTM C1363-2019. Results obtained are tested values and were secured by using the designated test method. Testing was conducted at Intertek B&C test facility in York, Pennsylvania.

SECTION 2

SUMMARY OF TEST RESULTS

Thermal Transmittance (U):	0.119	Btu/hr·ft^2·F
Thermal Resistance:	7.74	hr·ft^2·F/Btu

For INTERTEK B&C:

COMPLETED BY	Shon W. Einsig	**REVIEWED BY**	Ryan P. Moser
TITLE	Technician Team Leader, IIRC	**TITLE**	Senior Technician
SIGNATURE	Shon W. Einsig Digitally Signed by: Shon W. Einsig	**SIGNATURE**	Ryan P. Moser Digitally Signed by: Ryan P. Moser
DATE	10/27/21	**DATE**	10/27/21

SWE:pan

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SECTION 3
TEST SPECIMEN SUMMARY

SERIES/MODEL	ICF Thermal Testing Wall
TYPE	Structural Concrete Insulated Panel System
OVERALL SIZE	48" x 48"
TEST SAMPLE SUBMITTED BY	Client

SECTION 4
TEST METHOD

The specimens were evaluated in accordance with the following:

> **ASTM C1363-2019**, Standard Test Method for the Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus

SECTION 5
MATERIAL SOURCE/INSTALLATION

Test samples were provided by ACTS CONSTRUCTION, LLC. Representative samples of the test specimen will be retained by Intertek B&C for a minimum of five years from the test completion date.

Test Chamber Installation

The test sample was installed in a vertical orientation, the exterior of the specimen was exposed to the cold side.

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Shon W. Einsig	Intertek B&C
Ryan P. Moser	Intertek B&C

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SECTION 7
TEST SAMPLE DESCRIPTION

CONSTRUCTION	ICF Thermal Testing Wall
OVERALL SIZE	48" x 48"

Construction from Interior (Warm Side) to Exterior (Cold Side):	
ICF Thermal Panel:	2" EPS (expanded-polystyrene foam) foam panel
	7-1/4" center cavity (6 plastic cross-ties placed 4" from the ends and every 8" on center, with rebar #4 bar every 32" on center vertically and horizontally, and filled with concrete (2500 PSI wall mix with a 3/4" aggregate poured at a 6-1/2" slump).
	2" EPS (expanded-polystyrene foam) foam panel

**Stated per Client/Manufacturer*
N/A Non-Applicable

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SECTION 8
THERMAL TRANSMITTANCE (U-FACTOR): MEASURED TEST DATA

Heat Flows

1.	Total Measured Input into Metering Box (Qtotal)	140.25	Btu/hr
2.	Surround Panel Heat Flow (Qsp)	37.55	Btu/hr
3.	Surround Panel Thickness	15.00	inches
4.	Surround Panel Conductance	0.0131	Btu/hr·ft^2·F
5.	Metering Box Wall Heat Flow (Qmb)	6.23	Btu/hr
6.	EMF vs Heat Flow Equation (equivalent information)	-2,048.7100*EMF + 0.005	
7.	Flanking Loss Heat Flow (Qfl)	1.19	Btu/hr
8.	Net Specimen Heat Loss (Qs)	95.29	Btu/hr

Areas

1.	Test Specimen Projected Area (As)	16.00	ft^2
2.	Metering Box Opening Area (Amb)	75.11	ft^2
3.	Metering Box Baffle Area (Ab1)	70.84	ft^2
4.	Surround Panel Interior Exposed Area (Asp)	59.11	ft^2

Test Conditions

1.	Average Metering Room Air Temperature (th)	100.00	F
2.	Average Cold Side Air Temperature (tc)	50.01	F
3.	Average Guard/Environmental Air Temperature	100.00	F
4.	Metering Room Average Relative Humidity	6.96	%
5.	Metering Room Maximum Relative Humidity	7.49	%
6.	Metering Room Minimum Relative Humidity	6.45	%
7.	Measured Cold Side Wind Velocity (Perpendicular Flow)	10.32	mph
8.	Measured Warm Side Wind Velocity (Parallel Flow)	N/A	mph
9.	Measured Static Pressure Difference Across Test Specimen	0.00" ± 0.04"	H_2O

Average Surface Temperatures

1.	Metering Room Surround Panel	99.06	F
2.	Cold Side Surround Panel	50.70	F

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SECTION 9
THERMAL TRANSMITTANCE (U-FACTOR): CALCULATED TEST DATA

Results

1.	Thermal Conductance	0.13 Btu/hr·ft^2·F
2.	Thermal Resistance	7.74 hr·ft^2·F/Btu
3.	Overall Thermal Resistance (Ru)	8.39 hr·ft^2·F/Btu
4.	Warm Side Surface Resistance (Rh)	0.48 hr·ft^2·F/Btu
5.	Cold Side Surface Resistance (Rc)	0.17 hr·ft^2·F/Btu
6.	Warm Side Surface Conductance (hh)	2.09 Btu/hr·ft^2·F
7.	Cold Side Surface Conductance (hc)	5.75 Btu/hr·ft^2·F
8.	Thermal Transmittance of Test Specimen (U)	0.12 Btu/hr·ft^2·F

SECTION 10
TEST DURATION

1. The environmental systems were started at 8/19/2021 18:22:00 PM.
2. The test parameters were considered stable for two consecutive four hour test periods from 09/04/2021 00:29 to 09/04/2021 08:29.
3. The thermal performance test results were derived from 09/04/2021 04:29 to 09/04/2021 08:29.

ANSI/NCSL Z540-2-1997 type B uncertainty for this test was 4.37%.

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

The direction of heat transfer was from the interior (warm side) to the exterior (cold side) of the specimen. The ratings were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy. The data acquisition frequency is 5 minutes.

Required annual calibrations for the Intertek B&C, 'thermal test chamber' (ICN 000001) in York, Pennsylvania were last conducted in January 2021 in accordance with Intertek B&C calibration procedure. A CTS Calibration verification was performed August 2021. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed June 2021.

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SECTION 11
SURFACE TEMPERATURES

	WARM SIDE (F)	COLD SIDE (F)
1	96.69	51.13
2	97.05	50.98
3	96.90	50.92
4	97.15	51.03
5	96.72	51.11
6	97.19	51.00
7	97.35	51.12
8	97.76	51.05
9	97.49	51.05
AVERAGE	97.14	51.05

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SECTION 12
PHOTOGRAPHS

Photo #1, exterior of unit installed

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SECTION 12 CONT.

PHOTOGRAPHS

Photo #2, interior of unit installed

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SECTION 12 CONT.

PHOTOGRAPHS

Photo #3, unit being constructed

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SECTION 12 CONT.

PHOTOGRAPHS

Photo #4, unit being constructed, before concrete pour

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SECTION 12 CONT.

PHOTOGRAPHS

Photo #5, unit being constructed, before concrete pour

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SECTION 12 CONT.

PHOTOGRAPHS

Photo #6, exterior of test unit intalled and sealed with duct tape and caulke

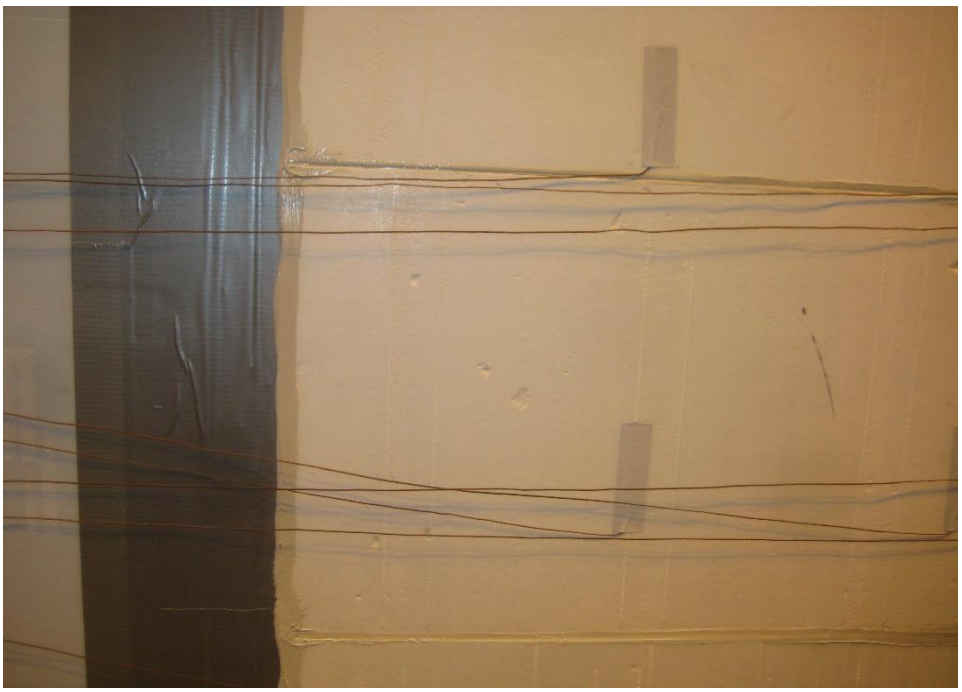

Photo #7, exterior of test unit intalled and sealed with duct tape and caulke

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SECTION 12 CONT.

PHOTOGRAPHS

Photo #8, interior of test unit intalled and sealed with duct tape and caulke

Photo #9, interior of test unit intalled and sealed with duct tape and caulke

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SECTION 14
REVISION LOG

REVISION #	DATE	PAGES	REVISION
.01 R0	10/27/21	N/A	Original Report Issue