

ARCONIC ARCHITECTURAL PRODUCTS TEST REPORT

SCOPE OF WORK

CAN/ULC S134, STANDARD METHOD OF FIRE TESTS OF EXTERIOR WALL ASSEMBLIES

REPORT NUMBER

G105154183SAT-003 R1

TEST DATE(S)

10/13/22

ISSUE DATE **[REVISED DATE]**

10/26/22 12/15/22

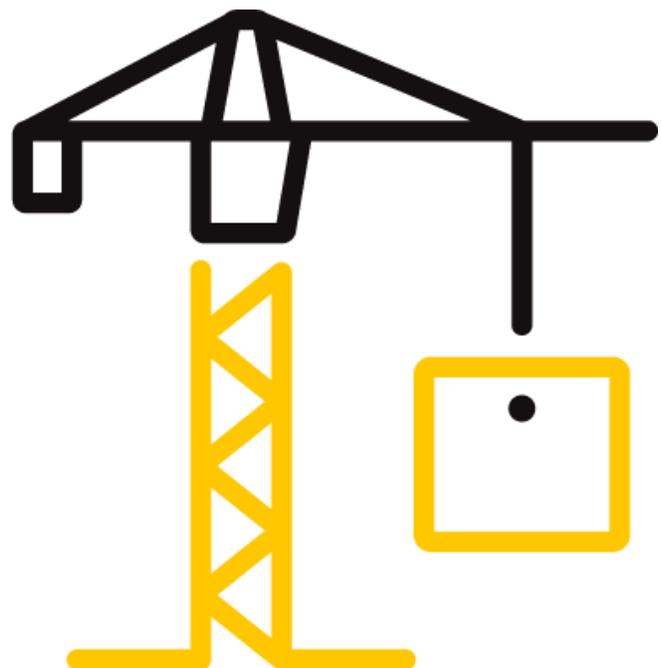
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DOCUMENT CONTROL NUMBER

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TEST REPORT FOR ARCONIC ARCHITECTURAL PRODUCTS

Report No.: G105154183SAT-003 R1

Date: 10/26/22

REPORT ISSUED TO

ARCONIC ARCHITECTURAL PRODUCTS

50 Industrial Drive
Eastman, GA 31023
USA

SECTION 1

SCOPE

Intertek Testing Services NA, Inc. dba Intertek Building & Construction (B&C) was contracted by Arconic Architectural Products, 50 Industrial Drive, Eastman, GA 31023, to perform testing in accordance with CAN/ULC-S134, *Standard Method of Fire Test of Exterior Wall Assemblies*, on their Reynobond® Aluminum Composite Panel assembly. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek Testing Services test facility in Elmendorf, Texas.

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.

Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens` (where required by Certification or Accreditation bodies), or other pertinent project documentation, will be retained for the entire test record retention period.

SECTION 2

SUMMARY OF TEST RESULTS

The assembly described and tested in this report **met** the Conditions of Acceptance of **CAN/ULC-S134, Standard Method of Fire Tests of Exterior Wall Assemblies, 2nd Edition, dated August 2013 (R2018)**. Construction of the full assembly is summarized in Section 8 of this test report.

For INTERTEK B&C:

COMPLETED BY:	Emmanuel Ogoe	REVIEWED BY:	Abel de Hoyos
TITLE:	Project Engineer – Building and Construction	TITLE:	Senior Project Manager – Fire Resistance
SIGNATURE:		SIGNATURE:	
DATE:	10/25/22	DATE:	10/26/22

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SECTION 3

TEST METHOD(S)

The specimen was evaluated in accordance with the following:

CAN/ULC-S134-2013, *Standard Method of Fire Test of Exterior Wall Assemblies; 2nd Edition, dated August 2013 (Reaffirmed 2018)*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test samples were provided by the client. The results outlined in this report apply to the sample as received. The specimens were witnessed during production and tagged prior to shipment on 08/22/2022, (Reference Intertek B&C Product preliminary sampling/Witnessing Report No. 105154183SAT-002, dated 08/22/2022). The wall assembly was installed on site at the Intertek lab in Elmendorf, Texas by John W. McDougall Co., Inc.

The test samples were received by the test facility on 10/06/22 and were given Intertek Sample IDs SAT2210061005-001 & SAT2210061005-002.

SECTION 5

EQUIPMENT

ASSET #	DESCRIPTION	MODEL	CAL DUE DATE
170199534	Stopwatch	Fisherbrand	03/23/23
HB9002195	DAQ Unit	Yokogawa	02/13/23
10361068	Thermo/Hygrometer	Omega	08/29/23
17332	Anemometer	Adafruit	09/20/23
17335	Anemometer	Adafruit	09/20/23
17336	Anemometer	Adafruit	09/20/23
215262	Radiometer	Medtherm	01/28/23
215263	Radiometer	Medtherm	01/28/23
189854	Radiometer	Medtherm	05/13/23
2642089	Gas Flow Transducer	Rosemount	10/29/22
461564	E-Type TC	Omega	11/01/22
1217181017	Gas Pressure Transducer	Omega	10/29/22

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SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Amanda Woodard	Arconic
Trey Jones	Arconic
Andres Olmos	Intertek B&C
Jonathan Werner	Intertek B&C
Emmanuel Ogoe	Intertek B&C

SECTION 7

TEST PROCEDURE

Testing was performed on 10/13/2022 in accordance with the CAN/ULC-S134 test method. Ambient conditions were 23.8°C and 50.3% relative humidity. Anemometers were used to verify ambient air velocity did not exceed 2 m/s as specified in the test method. Video recording, digital photographs, visual observations, and data collection were performed prior, during, and after testing was completed. All observations are recorded in the table located in Section 9.

In accordance with CAN/ULC-S134, once ambient conditions are met, the pilot burners are lit. The test then starts with the ignition of the burners. The burners proceed, controlled as specified in the test method, with a 5 min growth period, followed by a 15 min steady state period, followed by a 5 min ramp down period to zero.

Three water cooled heat flow transducers (0-100 kW/m²) were installed through the test specimen and the front wall of the test chamber 3.5 m above the top of the window opening; one within 0.2 m ± 0.05 m horizontally of the center line of the opening and one on each side and within 0.5 ± 0.1 m horizontally from the first. The transducers were installed so that their sensing faces were flush with the outer face of the test specimen. 24 GA (0.51 mm), Type K bare beaded thermocouples were used to monitor temperature of the specimen and were located approximately 89 mm to the right of the vertical center line and above the opening at 1.5 ± 0.05 m, 2.5 ± 0.05 m, 3.5 ± 0.05 m, 4.5 ± 0.05 m, 5.5 ± 0.05 m. At each of these levels, one thermocouple was installed on the outside face of the test specimen, one on the 2-in. mineral wool, and one on the VaproShield RevealFlashing SA weather barrier.

The assembly was instrumented with fifteen (15) thermocouples, at the prescribed heights, as follows:

- TCs 1-5: (Layer 1) Flush with exterior panels at 1.5 m, 2.5 m, 3.5 m, 4.5 m, and 5.5 m, respectively.
- TCs 6-10: (Layer 1) Flush with mineral wool at 1.5 m, 2.5 m, 3.5 m, 4.5 m, and 5.5 m, respectively.

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- TCs 11-15: (Layer 1) Flush with weather barrier at 1.5 m, 2.5 m, 3.5 m, 4.5 m, and 5.5 m, respectively.

SECTION 8

TEST SPECIMEN DESCRIPTION

The concrete base wall was sheathed with one-layer of 1/2 in. thick gypsum sheathing.

VaproShield RevealFlashing SA® Self-Adhered vapor barrier was applied to the surface of the gypsum sheathing. 16GA, 2 in. galvanized zee girts were then installed to the weather barrier using 1/4" x 2-1/4" long concrete fasteners, spaced at nominal 12 in. oc. 2 in. mineral wool insulation was then installed between the zee clips, having a density of 4.3 pcf. The 4mm Reynobond series 600 ACM panels were installed to the zee girts using 3 in. wide aluminium extrusions clips, spaced at nominal 36 in. oc, attached using #14 x 2-1/2 in. self-drilling screws.

The window opening jambs, sill and header were lined with .040 in. thick aluminum flashing, width of 4 in. This flashing was also used to seal the sides and top of the wall assembly. The header was also lined with 26GA steel flashing, width of 14 in. with 1 in. thick 6 pcf ceramic fiber blanket.

See Section 15 for detailed drawings of the test assembly.

SECTION 9

TEST OBSERVATIONS

FIRE-RESISTANCE TEST OBSERVATIONS	
Time (min:sec)	Observations
00:00	Test started at 8:55 am
03:30	Flame tips exiting window opening
04:47	Panels starting to warp
06:22	Flaming at header
07:00	Panel faces melting
08:30	Panels opened up
08:50	Pieces of flaming panels dropping
14:50	Flaming behind panels up to 3.5 meters above window opening
16:00	Flame height seen around 4 meters
23:47	Flaming seen around 3 meters
25:00	Gas off, flaming at third horizontal joint above window
51:00	All flaming out, observation period over

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SECTION 10
TEST RESULTS

The acceptance criteria in accordance with Clause 10.2 of the standard has the following requirements:

- Flaming on or in the wall assembly shall not spread more than 5 m above the opening in the test specimen.
- The average heat flux shall not be more than 35 kW/m² measured 3.5 m above the opening in the test specimen.

Data for the three radiometers installed at the 3.5 m height above the window is listed in the table below. The maximum flame spread observed above the window opening was **4 m**. The maximum average heat flux determined as required by the standard was **23.8 kW/m²**.

Time (min)	Left Radiometer 1 min Avg. (kW/m ²)	Right Radiometer 1 min Avg. (kW/m ²)	Center Radiometer 1 min Avg. (kW/m ²)	Visual Flame Height (meters)
0:00	-1.52	-1.71	-1.62	0
1:00	-1.62	-1.26	-1.68	0
2:00	-1.43	-1.44	-1.63	0
3:00	-1.33	-2.01	-1.19	0.5
4:00	0.31	0.90	2.86	1
5:00	0.94	2.21	5.34	1
6:00	2.31	3.44	6.54	2
7:00	3.22	5.08	8.40	2
8:00	3.35	5.70	9.39	2
9:00	4.82	8.61	12.53	2
10:00	5.81	8.15	12.70	3
11:00	5.17	13.99	14.38	3
12:00	5.92	16.79	16.20	2.5
13:00	6.15	14.63	14.70	2.5
14:00	5.96	16.83	23.46	3.5
15:00	6.93	16.57	18.52	3.5
16:00	8.41	23.80	20.63	4
17:00	11.58	18.68	18.94	3
18:00	8.58	21.09	16.51	3
19:00	6.60	17.85	13.42	2.5
20:00	5.07	18.74	13.88	2.5
21:00	5.86	21.97	16.26	2

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TEST RESULTS CONTINUED				
22:00	4.74	14.82	13.38	1
23:00	3.13	10.97	8.09	1
24:00	2.03	9.49	5.00	2.5
25:00	1.58	7.08	4.12	2.5
26:00	0.16	4.95	3.23	2.5
27:00	-0.51	3.15	2.37	2.5
28:00	-1.26	2.33	1.92	2.5
29:00	-1.05	1.29	2.00	2.5
30:00	-1.17	1.09	1.34	2.5
31:00	-0.83	0.99	1.70	2.5
32:00	-0.64	0.84	1.44	2.5
33:00	-0.58	0.77	1.36	2.5
34:00	-1.06	0.66	0.96	2.5
35:00	-1.39	0.55	0.70	2.5
36:00	-1.57	0.21	0.82	2.5
37:00	-1.05	0.31	0.44	2.5
38:00	-0.93	0.07	0.35	2.5
39:00	-0.67	-0.07	-0.16	2.5
40:00	-0.92	-0.24	0.12	2.5
41:00	-0.91	-0.22	-0.22	2.5
42:00	-0.75	-0.21	-0.41	2.5
43:00	-1.57	-0.36	-0.51	2.5
44:00	-0.89	-0.35	-0.45	2.5
45:00	-1.27	-0.57	-0.52	2.5
46:00	-1.11	-0.59	-0.84	2.5
47:00	-0.77	-0.55	-0.85	2.5
48:00	-1.02	-0.67	-0.99	2.5
49:00	-1.06	-0.75	-0.95	2.5
50:00	-1.34	-0.85	-0.78	2.5
51:00	-1.21	-0.79	-0.84	0
52:00	-1.41	-0.73	-0.85	0
53:00	-1.34	-0.81	-0.91	0



Total Quality. Assured.

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SECTION 11

CONCLUSION

The Aluminum Composite Panel Assembly as described in this report **met** the conditions of acceptance outlined in **CAN/ULC S134-2013**, Standard Method of Fire Test of Exterior Wall Assemblies 2nd Edition, dated August 2013 (Reaffirmed 2018).

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SECTION 12

PHOTOGRAPHS



Photo No. 1
Materials received



Photo No. 2
Mineral wool used

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Photo No. 3
Sampling markings



Photo No. 4
Weather barrier installed

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Photo No. 5
Weather barrier used



Photo No. 6
Installing Zee girts

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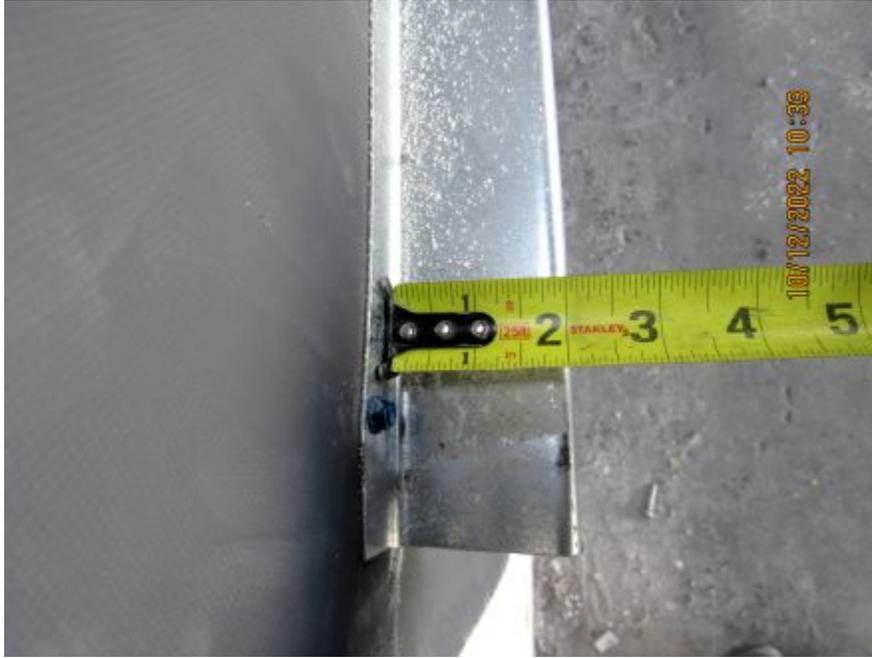


Photo No. 7
Zee girt depth



Photo No. 8
Zee girt lip height

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Photo No. 9
Zee girt spacing



Photo No. 10
Panel clips installed onto panels

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Photo No. 11
Mineral wool installed



Photo No. 12
Thermocouple installed on mineral wool

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Photo No. 13
Panel installation



Photo No. 14
Assembly completed

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Photo No. 15
Window opening pre-test



Photo No. 16
Pilot burner ignition, start of test

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Photo No. 17
Gas increasing



Photo No. 18
Flame tips exiting window opening

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Photo No. 19
Flame tips at 1 meter



Photo No. 20
Flaming at window header

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Photo No. 21
Flame increased to 2.5 meters



Photo No. 22
Flaming behind panels

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Photo No. 23
Pieces of flaming panels dropping



Photo No. 24
Flame height at 4 meters

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Photo No. 25
End of test, residual flaming at 2.5 meters



Photo No. 26
Post-test

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Photo No. 27
Window opening post-test



Photo No. 28
Mineral wool above window opening post-test

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Photo No. 29
Weather barrier damage post-test



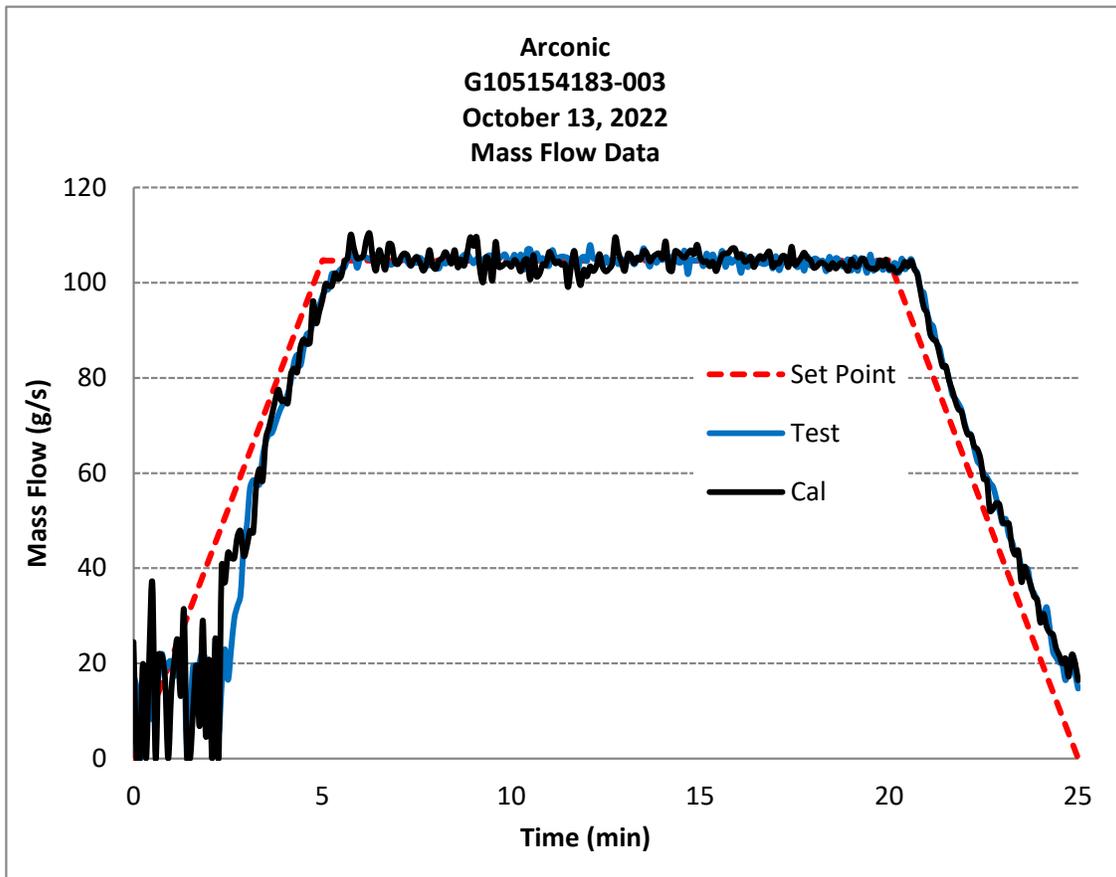
Photo No. 30
Wall assembly post-test

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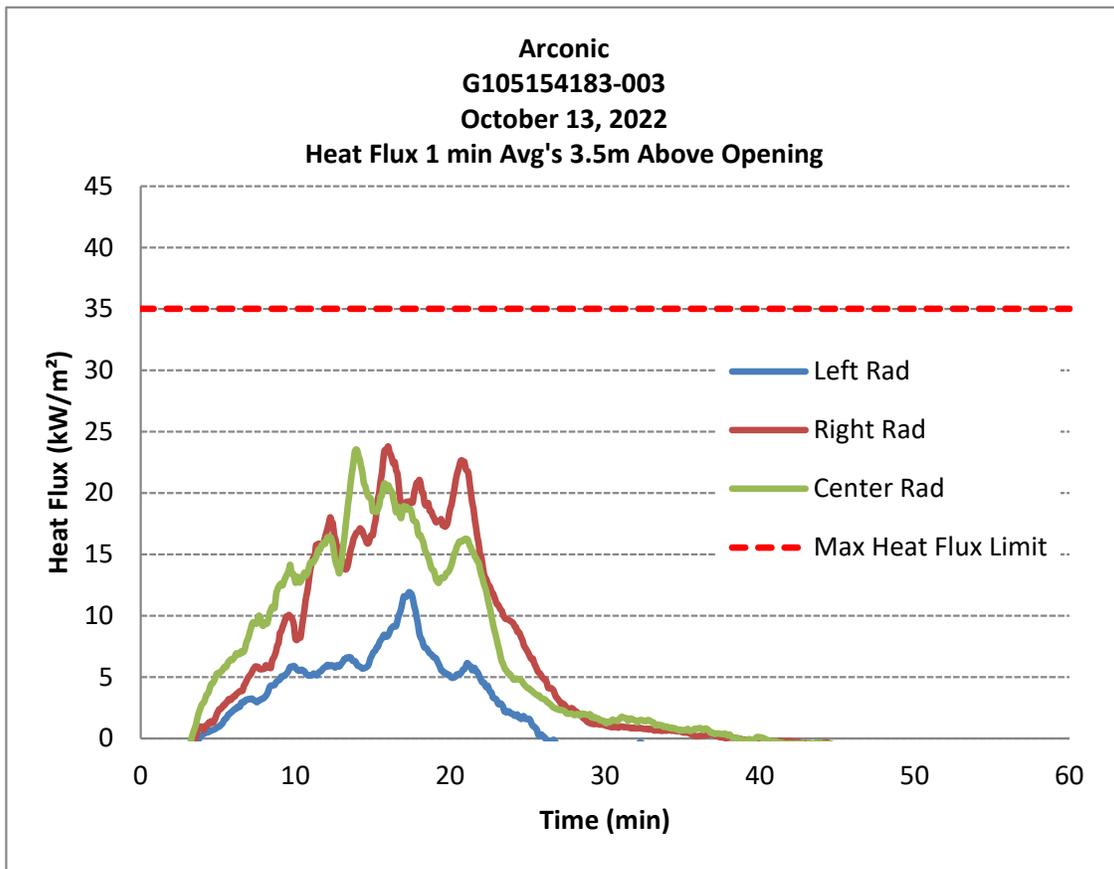
SECTION 13 GRAPHS



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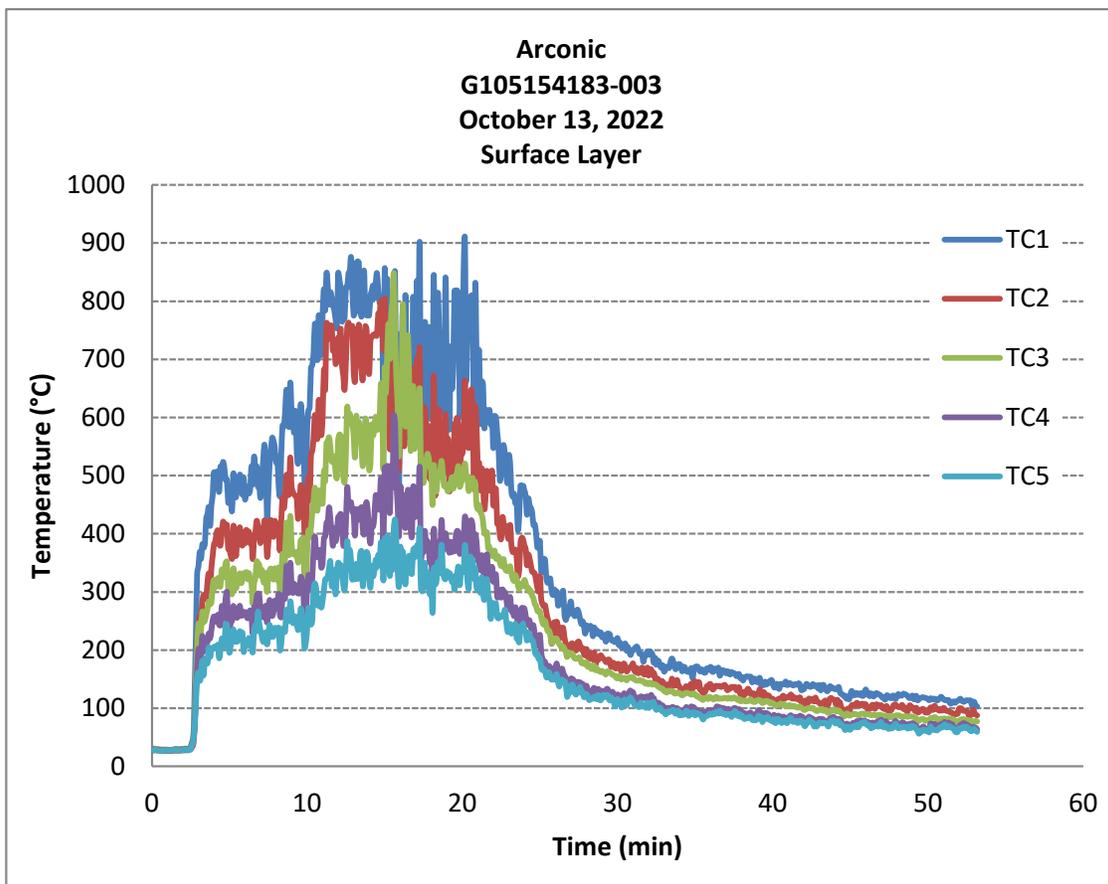
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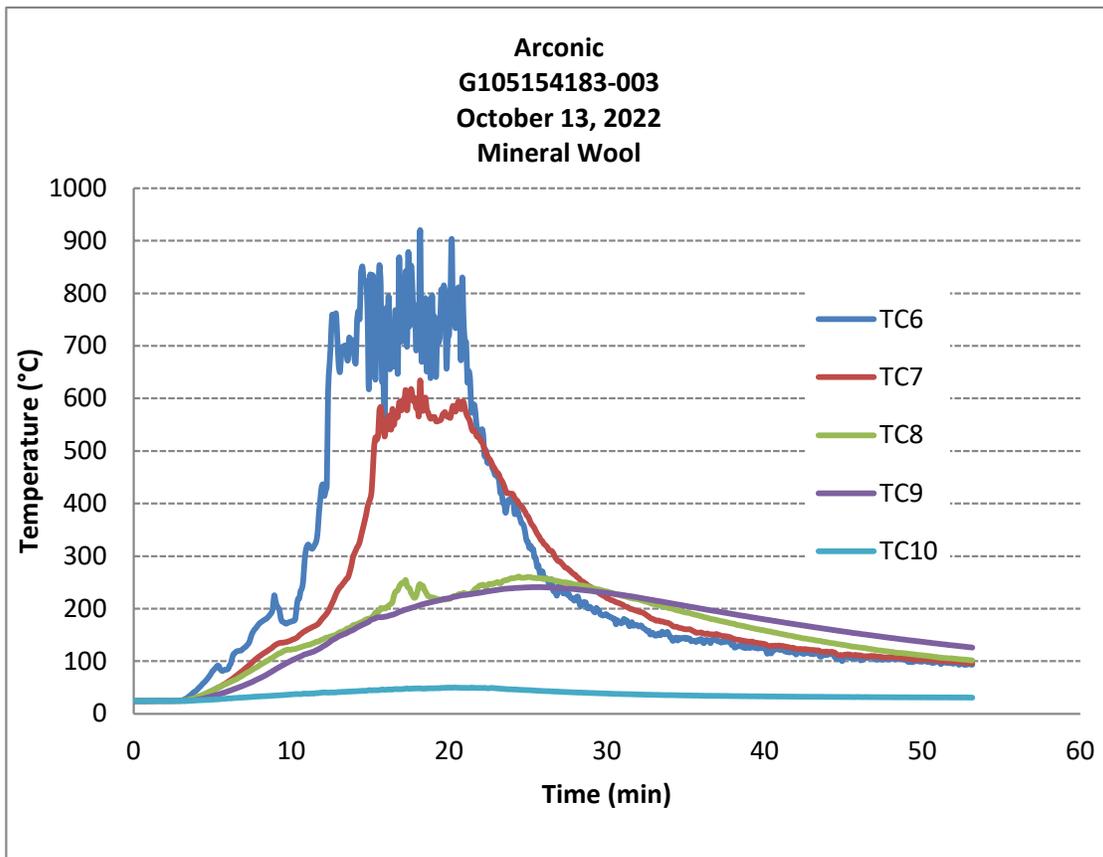
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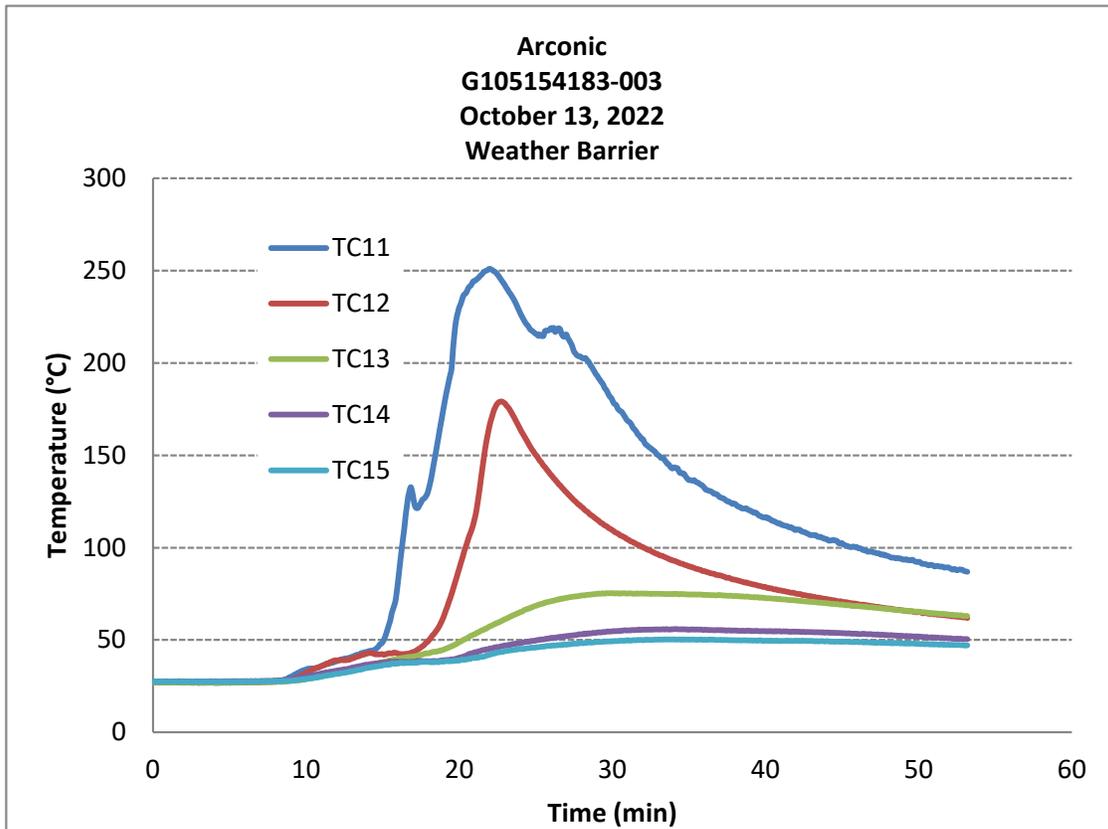
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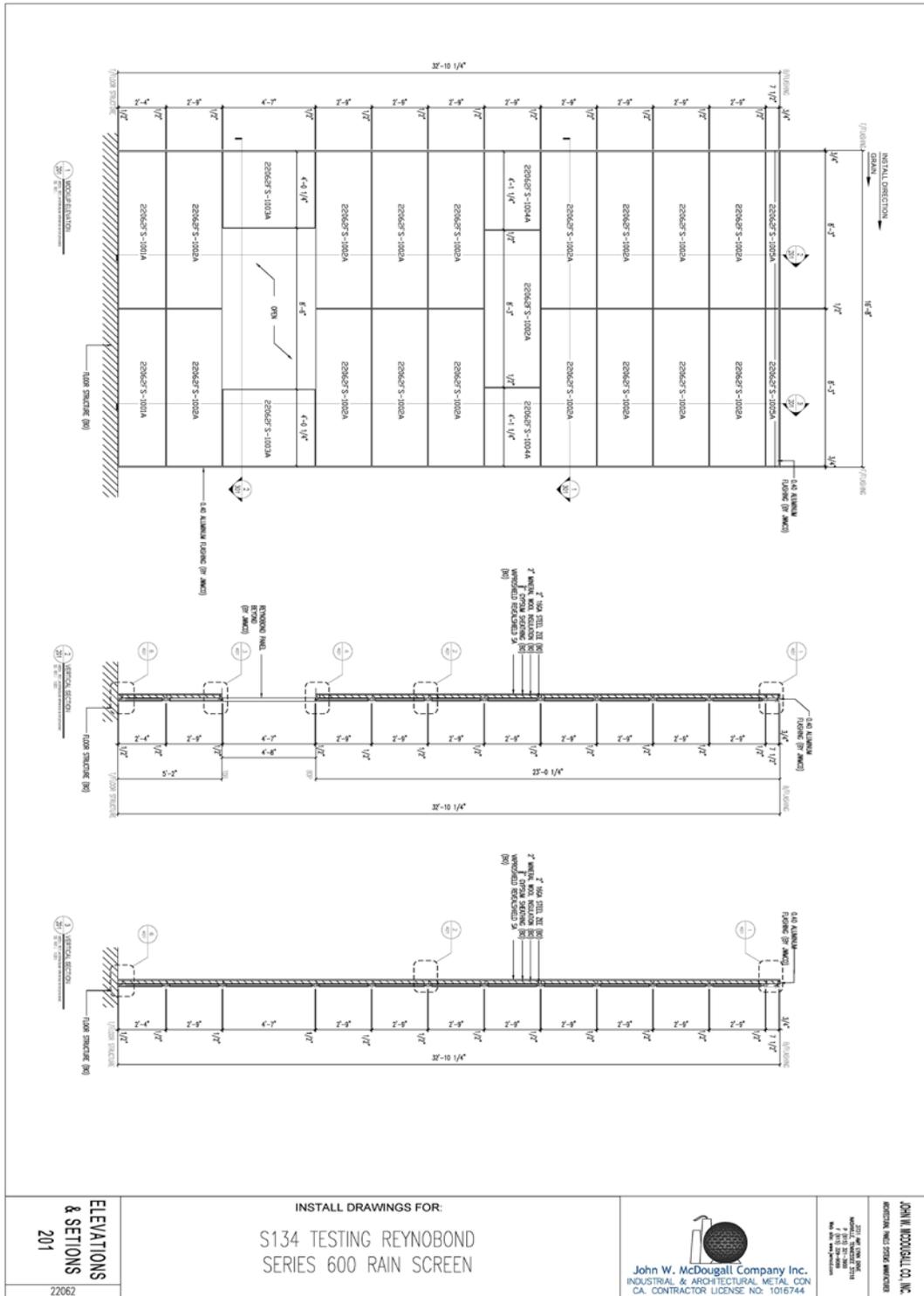
SECTION 14 DRAWINGS

The "As-Built" drawings for the Reynobond Series 600 Rain Screen ACM System CAN/ULC S134 test; Sheet Nos. 1-5 and dated October 24, 2022; which follow have been reviewed by Intertek B&C and are representative of the project reported herein. Project 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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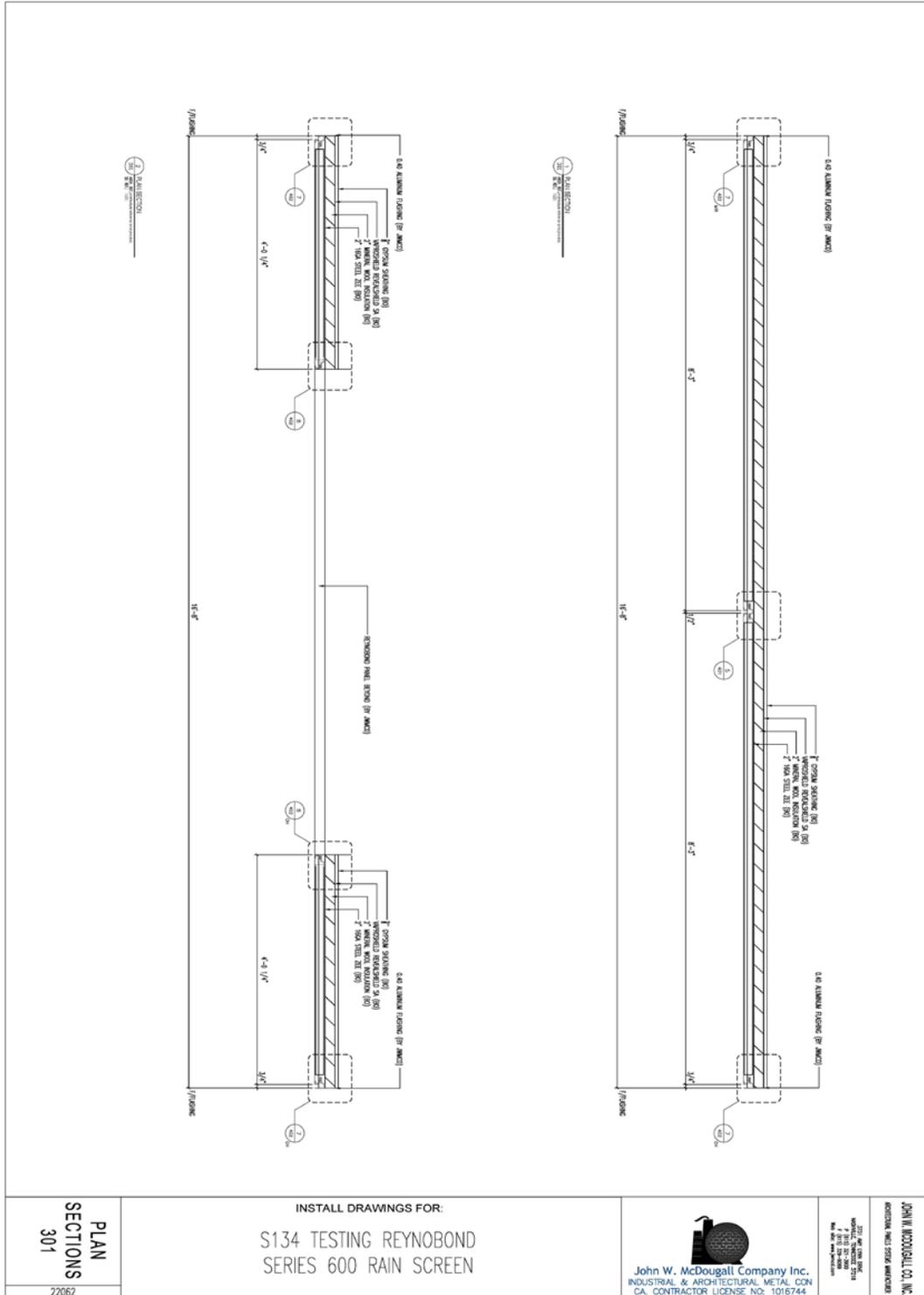
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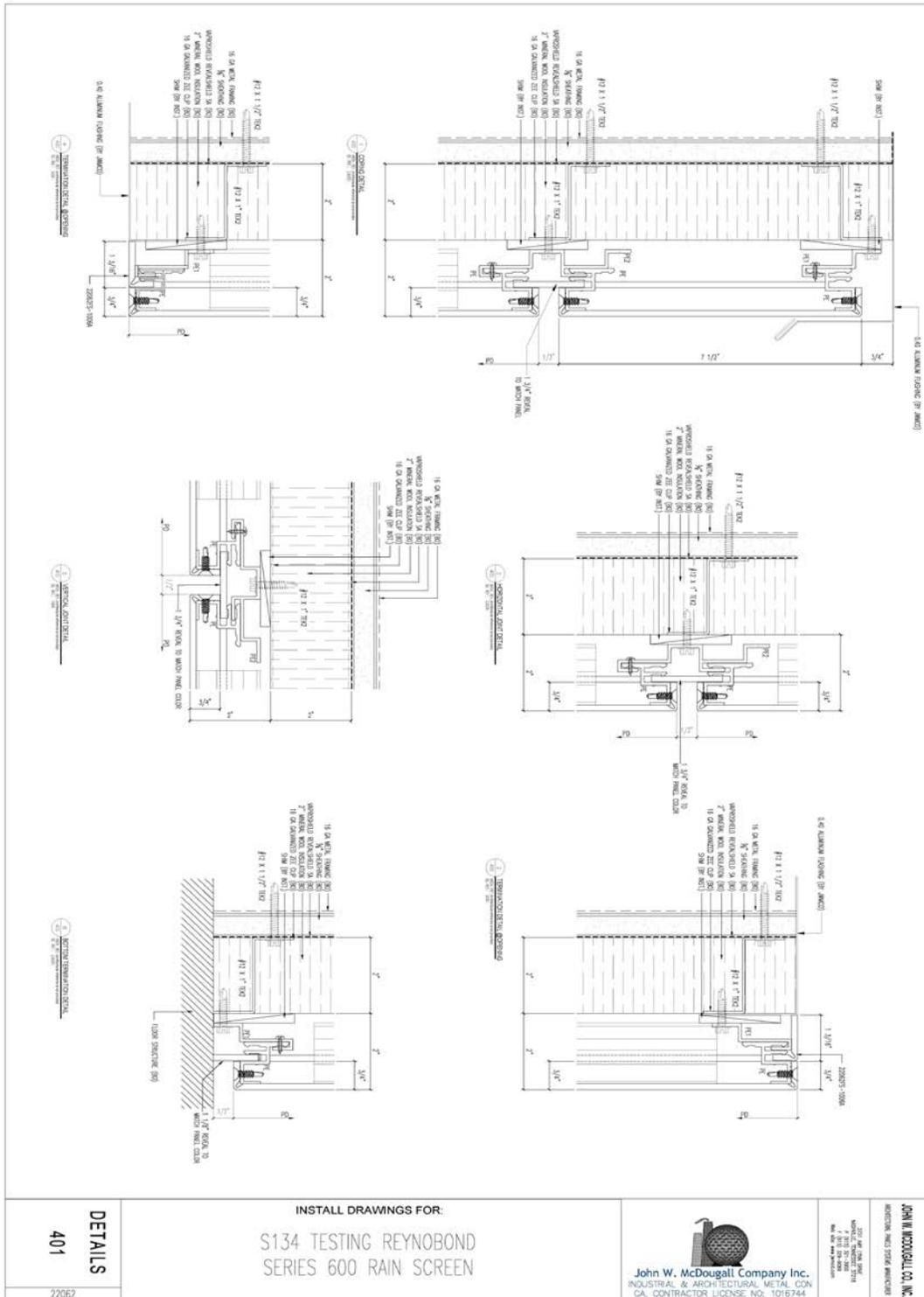
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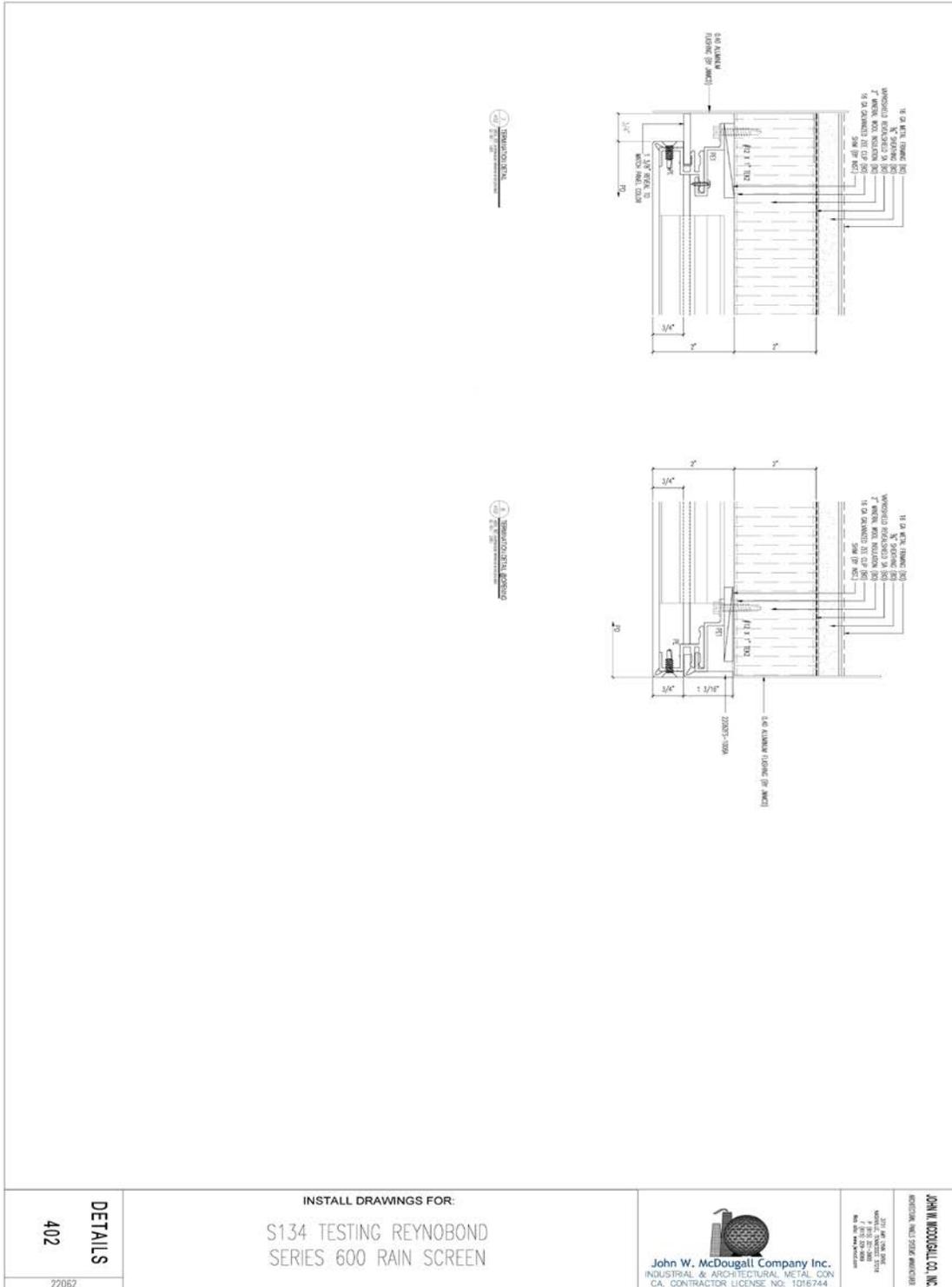
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SECTION 15

REVISION LOG

REVISION #	DATE	SECTION	REVISION
0	10/26/22	N/A	Original Report Issue
1	12/15/22	14	Revised Construction Drawings E.O. 
