

STAC, S.L. FIRE TEST REPORT

SCOPE OF WORK

CAN/ULC S134, STANDARD METHOD OF FIRE TESTS OF EXTERIOR WALL ASSEMBLIES CONTAINING PANNEAUX 3D ACM PANELS WITH 4 MM FR BY STACBOND

REPORT NUMBER

103816489SAT-003

TEST DATE

06/14/19

ISSUE DATE [REVISED DATE]

06/17/19 N/A

RECORD RETENTION END DATE

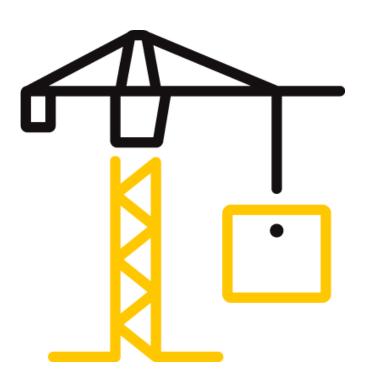
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PAGES

35

DOCUMENT CONTROL NUMBER

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TEST REPORT FOR STAC, S.L.

Report No.: 103816489SAT-003

Date: 06/17/19

REPORT ISSUED TO

STAC S.L.

Poligono Industrial Picusa S/N 15900 Padron A Coruna SPAIN

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by STAC S.L., Poligono Industrial Picusa S/N, 15900 Padron, A Coruna, SPAIN to evaluate resistance to flame propagation in accordance with CAN/ULC-S134, Standard Method of Fire Test of Exterior Wall Assemblies, 2nd Edition, dated August 2013, on Panneaux 3D ACM Panels with 4 mm StacBond FR. Testing was conducted at the Intertek B&C test facility in Elmendorf, Texas, USA. Results obtained are tested values and were secured by using the designated test method.

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

SECTION 2

SUMMARY OF TEST RESULTS

Wall System: Exterior Wall Assembly

Combustible Components: Panneaux 3D ACM Panels with 4 mm StacBond FR

CAN/ULC S134 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**, **2**nd **Edition**, **dated August 2013**. Construction of the full assembly is summarized in Section 9 of this test report.

For INTERTEK B&C:

COMPLETED BY:

Abel de Hoyos

Senior Project Manager –

Fire Resistance

SIGNATURE: 06/21/19

REVIEWED BY: Herbert W. Stansberry II
Program Manager,
Building & Construction

SIGNATURE: 06

06/24/19

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SECTION 3

TEST METHOD(S)

The assembly was evaluated in accordance with the following:

CAN/ULC-S134, Standard Method of Fire Test of Exterior Wall Assemblies, 2nd Edition, dated August 2013

SECTION 4

MATERIAL SOURCE/INSTALLATION

Samples were selected by Intertek representative Juan M. Flores on 03/11/19 and 03/12/2019 at the STAC S.L. manufacturing facility located at Poligono Industrial La Rozada, Parcela 2, Calle Isaac Prado Bodelon, 24516 Toral De Los Vados, Parandones, Leon, SPAIN. The samples were received at the Evaluation Center on 06/03/19 and were assigned Intertek Sample ID No. SAT1906031657-001. The samples contained the mark of the inspector.

The subject test specimens are traceable samples selected from the manufacturer's facility. Intertek selected the specimens and has verified their composition, manufacturing techniques and quality assurance procedures

SECTION 5

CALIBRATED INSTRUMENTATION USED FOR TESTING

| Description | Serial No. | Calibration Due Date |
|-------------------------|------------|-------------------------|
| Stopwatch | 170558059 | 08/02/19 |
| DAQ Unit | HB9002195 | 08/03/19 |
| Thermo/Hygrometer | 170747548 | 10/16/19 |
| Anemometer | 17339 | 10/04/19 |
| Anemometer | 17338 | 10/04/19 |
| Anemometer | 17337 | 10/04/19 |
| Anemometer | 173310 | 10/04/19 |
| Radiometer | 206351 | 10/04/19 |
| Radiometer | 189853 | 10/04/19 |
| Radiometer | 189854 | 10/04/19 |
| Gas Flow Transducer | 2642089 | 10/04/19 |
| E-Type TC | 461564 | 10/04/19 |
| Gas Pressure Transducer | 1026161022 | 10/04/19 |



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SECTION 6

LIST OF OFFICIAL OBSERVERS

| NAME | COMPANY |
|------------------|--------------|
| Marcos Garcia | STAC, S.L. |
| Anxo Faya Regars | STAC, S.L. |
| Emmanuel Ogoe | Intertek B&C |
| Juan M. Flores | Intertek B&C |
| Chris Owen | Intertek B&C |
| Abel de Hoyos | Intertek B&C |

SECTION 7

TEST PROCEDURE

Testing was performed on 06/14/2019 in accordance with the CAN/ULC S134 test method. Ambient conditions were 30°C and 58% 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. The test was performed at 11:00 AM. All observations are recorded in the table located in Section 8.

In accordance with CAN/ULC \$134, 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 \pm 0.05 m horizontally of the center line of the opening and one on each side and within 0.5 \pm 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. Two (2) layers of 24 GA (0.51 mm), Type K bare beaded thermocouples were used to monitor temperature of the specimen and were located on the vertical center line and above the opening at 1.5 \pm 0.05 m, 2.5 \pm 0.05 m, 3.5 \pm 0.05 m, 4.5 \pm 0.05 m. At each of these levels, one thermocouple was installed on the interface between the weather barrier and the air cavity behind the panels and at the outer layer of the specimen.

The output of the transducers and thermocouples were monitored by a National Instruments CDAQ-9188 Data Acquisition Unit. The data acquisition system was programmed to scan and save



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data every 5 seconds. Following the test, the files were imported into MS Excel for graphical display. The graphical display data can be found in Section 13.

SECTION 8

TEST OBSERVATIONS

| FIRE-RESIST | FIRE-RESISTANCE TEST OBSERVATIONS | | | |
|-------------|---|--|--|--|
| Time | Observations | | | |
| (Min:Sec) | | | | |
| Pre-test | Nothing to note | | | |
| 00:00 | Test started at 11:00 A.M. | | | |
| 03:20 | Flames tips coming out of burn room opening | | | |
| 04:30 | Soot deposits collecting on panels directly above opening | | | |
| 06:00 | Flame tips at 2 m | | | |
| 06:10 | Panels directly above opening beginning to warp | | | |
| 07:10 | Intermittent flaming on right side panel above opening | | | |
| 08:00 | Flame tips at 2.5 m | | | |
| 10:00 | Flaming on left side panel above opening, flame tips at 2.5 m | | | |
| 10:50 | Flaming at center of widow header | | | |
| 12:00 | Flaming droplets falling | | | |
| 13:00 | Flame tips at 3 m | | | |
| 14:00 | Sustained flaming at 1 m | | | |
| 15:30 | Sustained flaming at 2 m, flame tips at 3 m | | | |
| 17:00 | Sustained flaming at 2.5 m | | | |
| 22:00 | Flaming localized to above window header | | | |
| 25:00 | Gas off, sustained flaming at window header | | | |
| 26:40 | Visible sustained flaming self-extinguished | | | |
| 27:40 | Small flaming behind right panel above opening | | | |
| 53:00 | Small flaming behind right panel self-extinguished | | | |
| 60:00 | End of test. | | | |

SECTION 9

TEST SPECIMEN DESCRIPTION

The Panneaux 3D ACM Panels with 4 mm StacBond FR consisted of sub construction, sheathing, staple applied air and moisture barrier, flashing and the ACM panels.

<u>Exposed side sheathing</u> – 4 ft. by 10 ft. by 5/8 in. thick, Type X Gypsum installed with the long dimension perpendicular to the CMU block wall.

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<u>Air Barrier</u> – Vapro Shield® WrapShield® IT breathable air barrier. The installation was completed

on 06/10/19.

<u>ACM Panels and Wall Brackets</u> – Pre-assembled panels incorporating aluminium extrusions, aluminium stiffeners and pre-attached wall bracket. Refer to Section 14 of this report for further details.

The assembly was completed on 06/13/19.

SECTION 10

TEST RESULTS

| Time | Left Radiometer | Right Radiometer | Center Radiometer | Visual Flame Height |
|-------|-----------------|------------------|-------------------|---------------------|
| (min) | (1 min. Avg.) | (1 min. Avg.) | (1 min. Avg.) | (in meters) |
| 0:00 | -1.19 | -0.97 | -1.73 | 0 |
| 1:00 | -0.96 | -0.95 | -0.45 | 0 |
| 2:00 | -0.80 | -0.69 | -0.46 | 0 |
| 3:00 | -0.50 | -0.17 | -0.05 | .5 m |
| 4:00 | 0.46 | 0.14 | 2.71 | 1 m |
| 5:00 | 0.91 | -0.16 | 3.95 | 1 m |
| 6:00 | 0.86 | -0.11 | 2.88 | 2 m |
| 7:00 | 0.97 | 0.13 | 1.52 | 2 m |
| 8:00 | 2.14 | 1.75 | 2.99 | 2.5 m |
| 9:00 | 2.05 | 2.41 | 4.07 | 2.5 m |
| 10:00 | 1.93 | 3.05 | 4.34 | 2.5 m |
| 11:00 | 2.05 | 4.06 | 4.75 | 2.5 m |
| 12:00 | 2.25 | 4.19 | 4.70 | 2.5 m |
| 13:00 | 2.92 | 4.74 | 6.71 | 3 m |
| 14:00 | 3.24 | 5.18 | 7.39 | Flaming at 1 m |
| 15:00 | 3.05 | 5.88 | 5.27 | 1 m |
| 16:00 | 3.33 | 5.67 | 8.22 | Flaming at 2 m |
| 17:00 | 3.69 | 4.88 | 8.26 | 2.5 m |
| 18:00 | 3.02 | 4.67 | 8.65 | 2.5 m |
| 19:00 | 2.77 | 5.22 | 8.82 | 2.5 m |
| 20:00 | 2.68 | 5.80 | 7.46 | 2.5 m |
| 21:00 | 2.75 | 6.28 | 8.24 | 2.5 m |
| 22:00 | 2.15 | 5.95 | 5.88 | 2.5 m |
| 23:00 | 1.97 | 4.87 | 6.33 | 2.5 m |
| 24:00 | 1.85 | 4.12 | 6.93 | 2.5 m |

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| Time | Left Radiometer | Right Radiometer | Center Radiometer | Visual Flame Height |
|-------|-----------------|------------------|-------------------|-----------------------|
| (min) | (1 min. Avg.) | (1 min. Avg.) | (1 min. Avg.) | (in meters) |
| 25:00 | 1.42 | 4.08 | 7.90 | Flaming at header |
| 26:00 | 2.01 | 5.07 | 1.79 | Flaming at header |
| 27:00 | 1.17 | 4.27 | 5.71 | Visible flaming out |
| 28:00 | 1.60 | 3.19 | -0.14 | Flaming behind panel |
| 29:00 | 1.01 | 4.24 | 0.19 | 1 m |
| 30:00 | 0.13 | 3.92 | 1.14 | 1 m |
| 31:00 | -0.02 | 3.58 | 2.10 | 1 m |
| 32:00 | -0.44 | 3.26 | 5.72 | 1 m |
| 33:00 | 0.78 | 2.92 | -1.67 | 1 m |
| 34:00 | 0.43 | 2.19 | -7.72 | 1 m |
| 35:00 | -0.10 | 2.03 | -5.88 | 1 m |
| 36:00 | 0.40 | 1.85 | 4.14 | 1 m |
| 37:00 | -1.23 | 1.74 | -2.25 | 1 m |
| 38:00 | 1.20 | 1.53 | -1.09 | 1 m |
| 39:00 | -0.29 | 1.44 | -7.23 | 1 m |
| 40:00 | 0.39 | 1.33 | 0.81 | 1 m |
| 41:00 | 0.03 | 1.15 | 1.23 | 1 m |
| 42:00 | 0.05 | 1.20 | 0.78 | 1 m |
| 43:00 | -0.01 | 1.11 | 0.77 | 1 m |
| 44:00 | 0.17 | 1.10 | 1.26 | 1 m |
| 45:00 | 0.13 | 1.07 | 2.01 | 1 m |
| 46:00 | -0.18 | 1.11 | 1.64 | 1 m |
| 47:00 | -0.21 | 1.03 | 1.22 | 1 m |
| 48:00 | 0.42 | 1.09 | 1.98 | 1 m |
| 49:00 | -0.42 | 0.96 | 1.31 | 1 m |
| 50:00 | -0.28 | 1.05 | 0.81 | 1 m |
| 51:00 | -0.40 | 0.97 | 0.41 | 1 m |
| 52:00 | -0.18 | 0.86 | 0.85 | 1 m |
| 53:00 | 0.02 | 0.83 | 1.19 | Sustained Flaming out |
| 54:00 | -0.18 | 0.79 | 0.23 | |
| 55:00 | -0.31 | 0.65 | 1.47 | |
| 56:00 | -0.36 | 0.53 | 0.36 | |
| 57:00 | -0.30 | 0.44 | 0.84 | |
| 58:00 | -0.22 | 0.48 | 0.71 | |
| 59:00 | -0.52 | 0.39 | 0.08 | |
| 60:00 | -0.34 | 0.31 | 0.69 | |



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SECTION 11

CONCLUSION

The STAC, S.L. exterior wall assembly containing, Panneaux 3D ACM Panels with 4 mm StacBond FR met the conditions of acceptance outlined in CAN/ULC-S134, Standard Method of Fire Test of Exterior Wall Assemblies, 2nd Edition, dated August 2013.

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SECTION 12

PHOTOGRAPHS



Photo No. 1
Application of Weather Barrier



Photo No. 2
Vapro Shield® WrapShield® IT Breathable Air Barrier



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Photo No. 3 Vapro Shield® Vapro Tape™

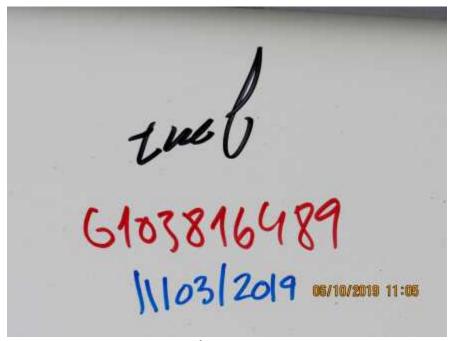


Photo No. 4
Inspector's Signature, Project Number and Date



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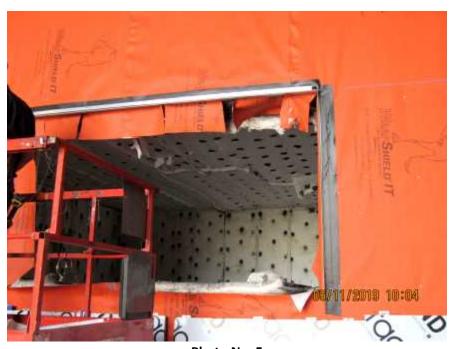


Photo No. 5
Installation of J-Trim around Opening



Photo No. 6
Installation of Vapro Shield® Vapro Tape™



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Photo No. 7
Installation of Panels



Photo No. 8
Completed Assembly



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Photo No. 9 Beginning of Test



Photo No. 10 Flames Coming Out of Opening



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Photo No. 11 View During Test



Photo No. 12
View During Test, Flaming Residue on Ground



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Photo No. 13 Flaming Above Header



Photo No. 14 Flaming Above Header



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Photo No. 15
Sustained Flaming After End of Test



Photo No. 16
Post Test View of Panels



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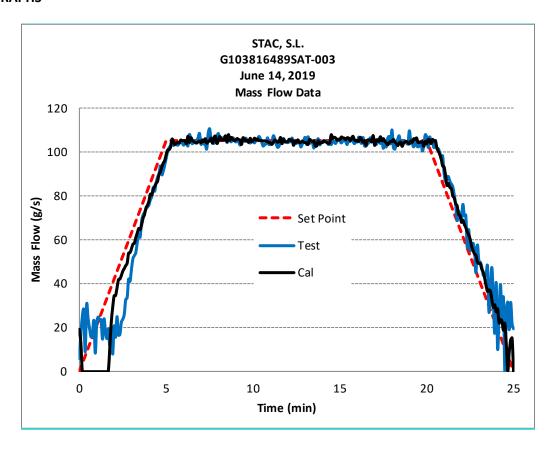
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GRAPHS

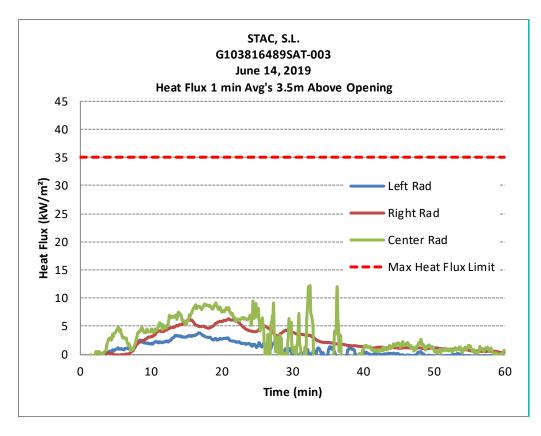




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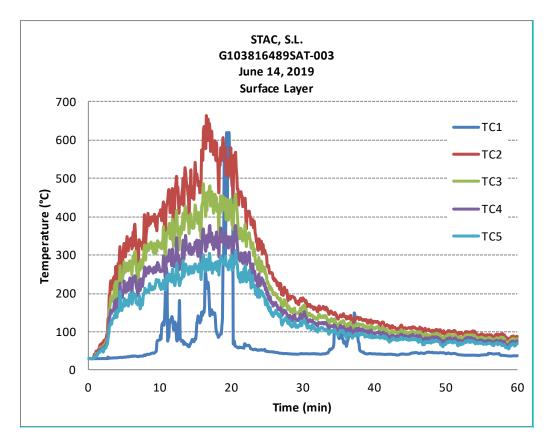




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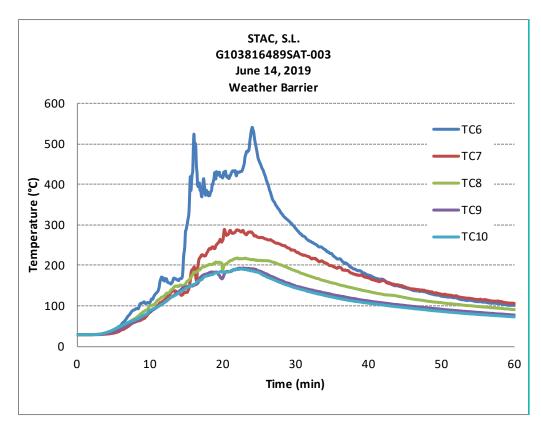




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SECTION 14

DRAWINGS

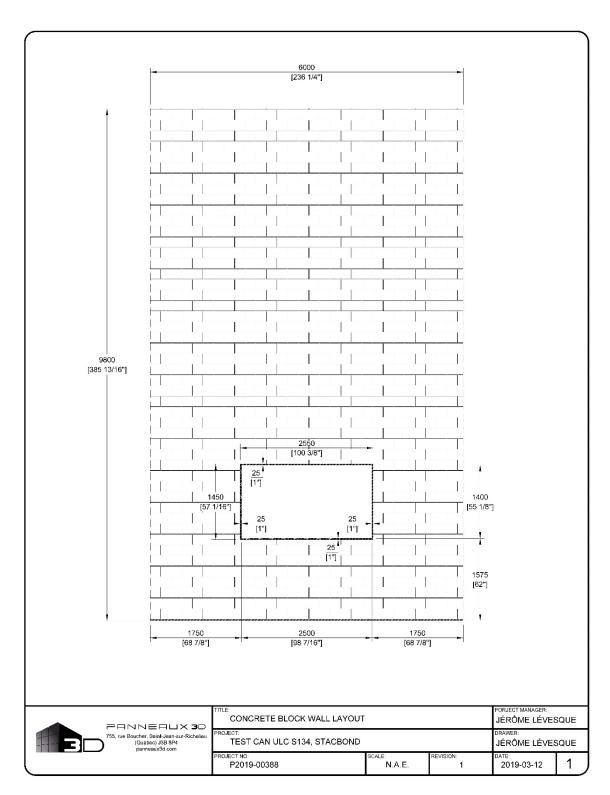
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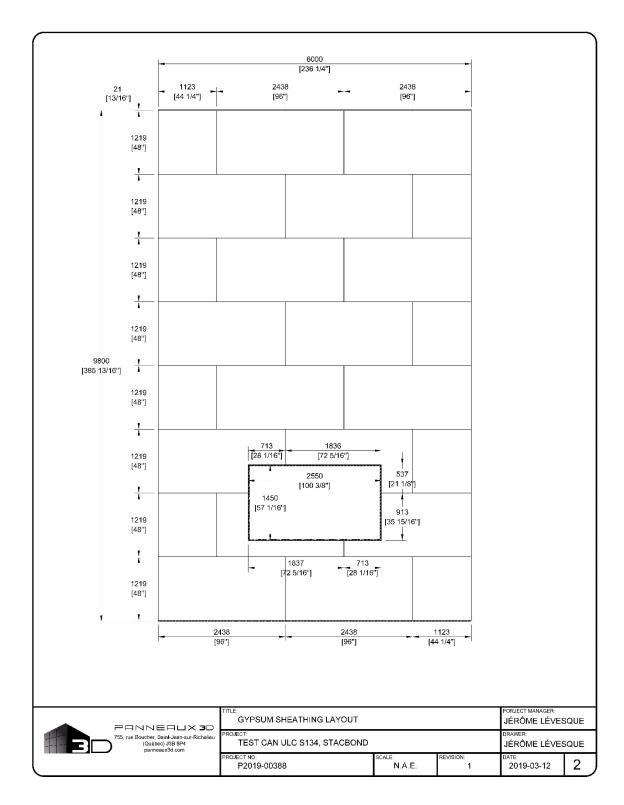




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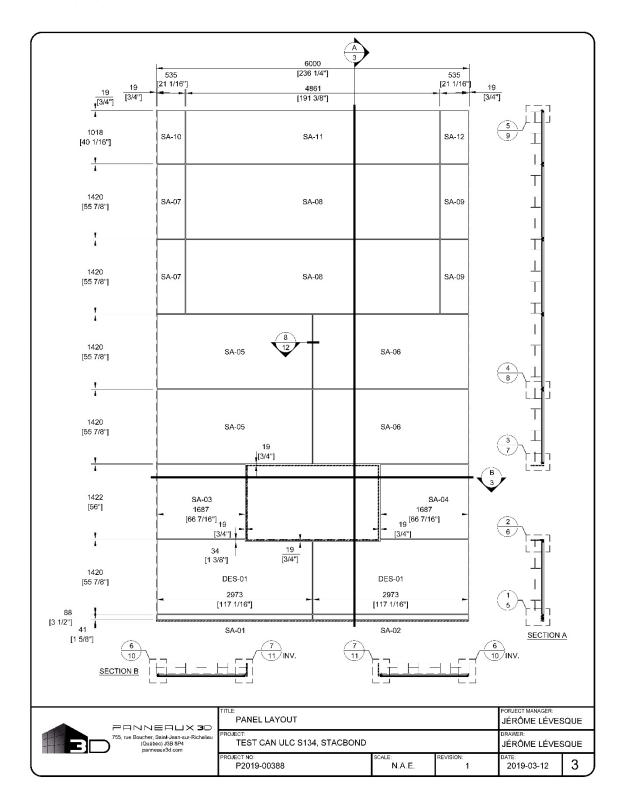




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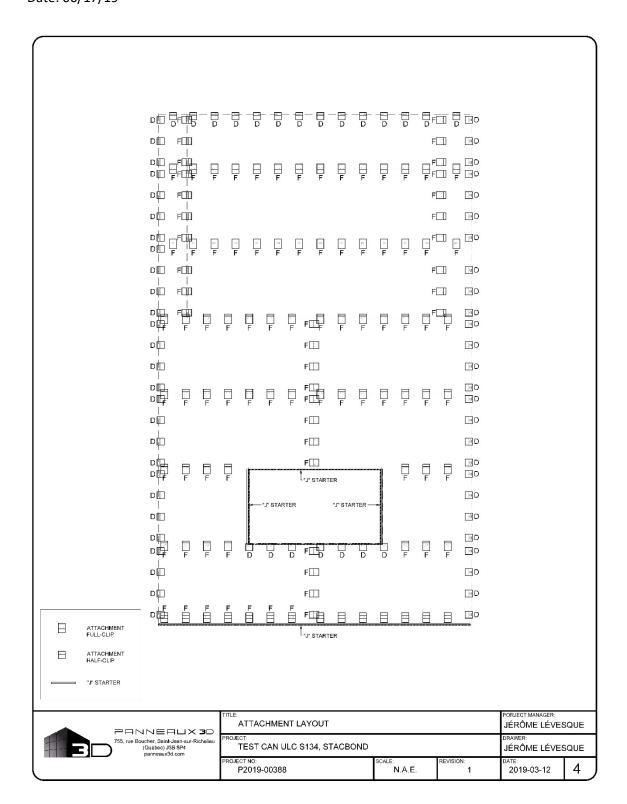
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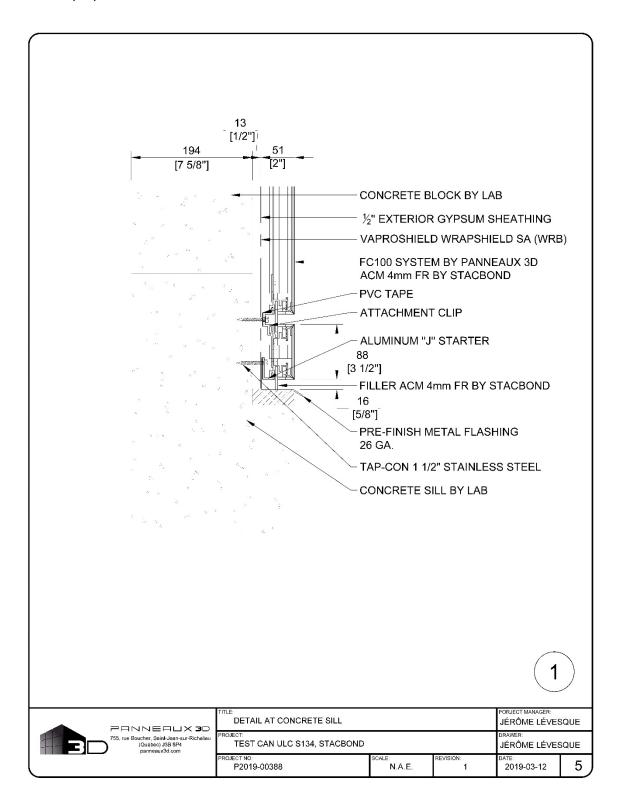
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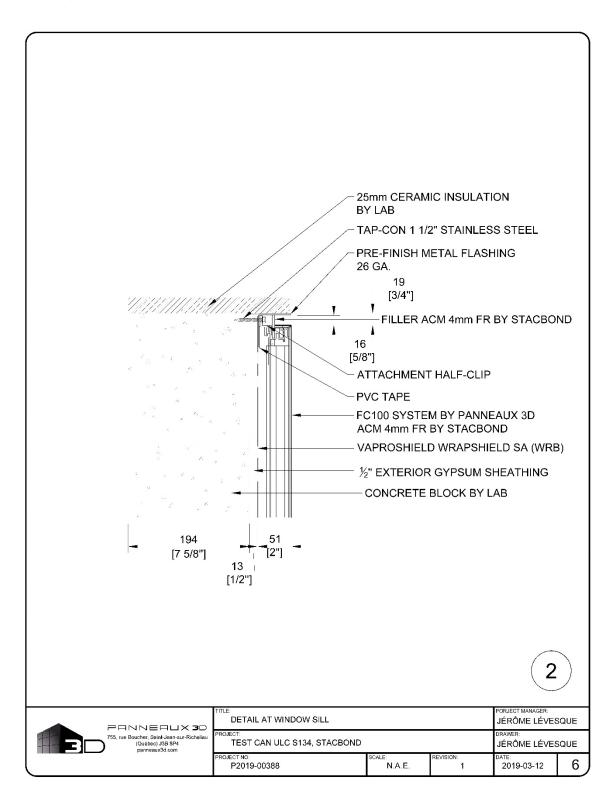




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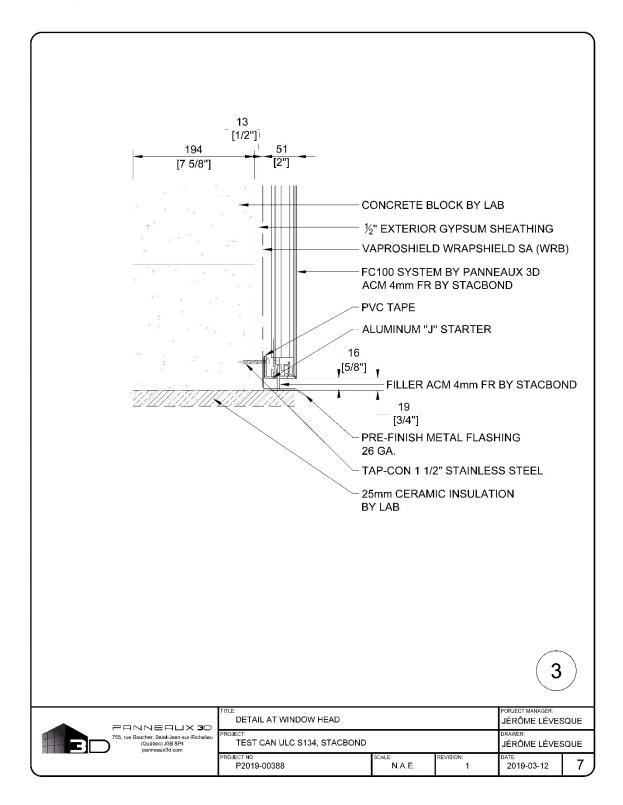




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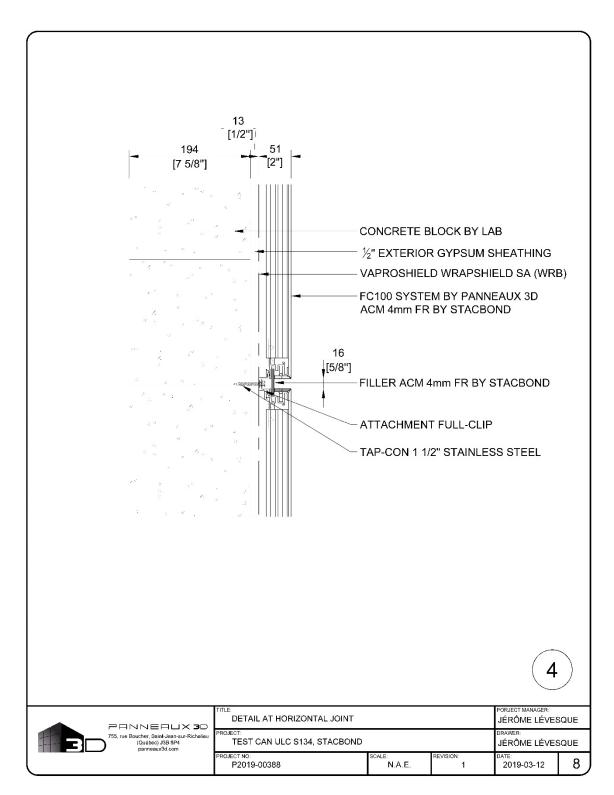




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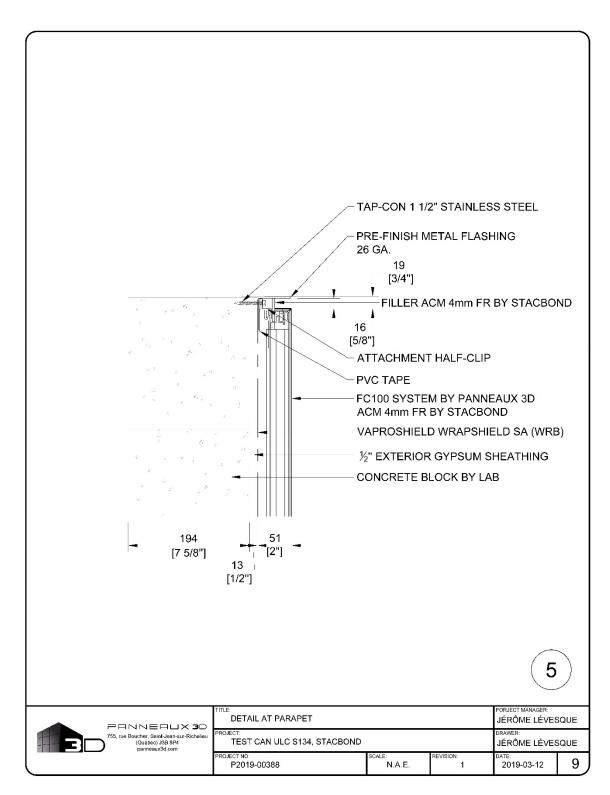




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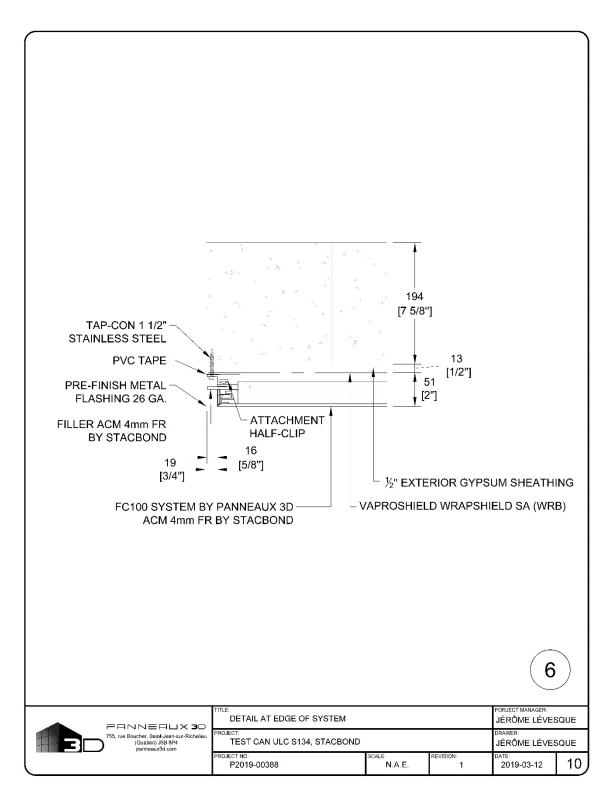




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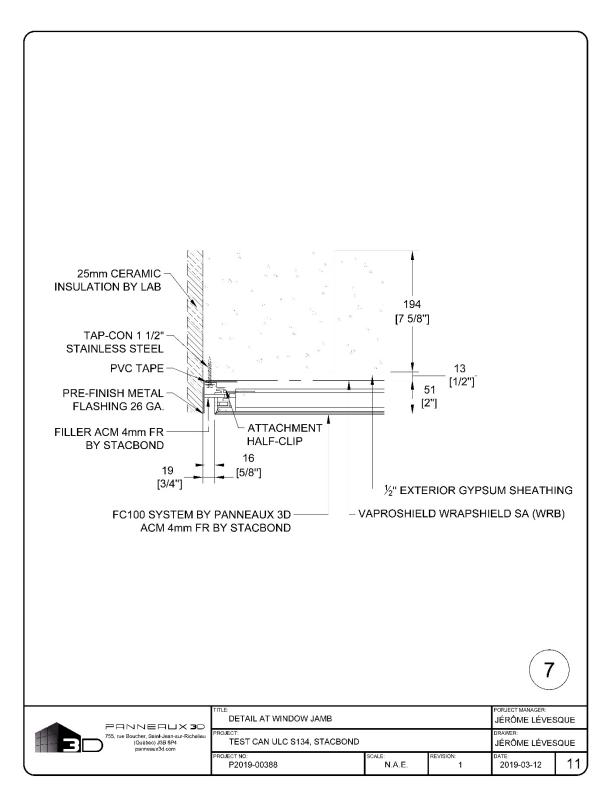




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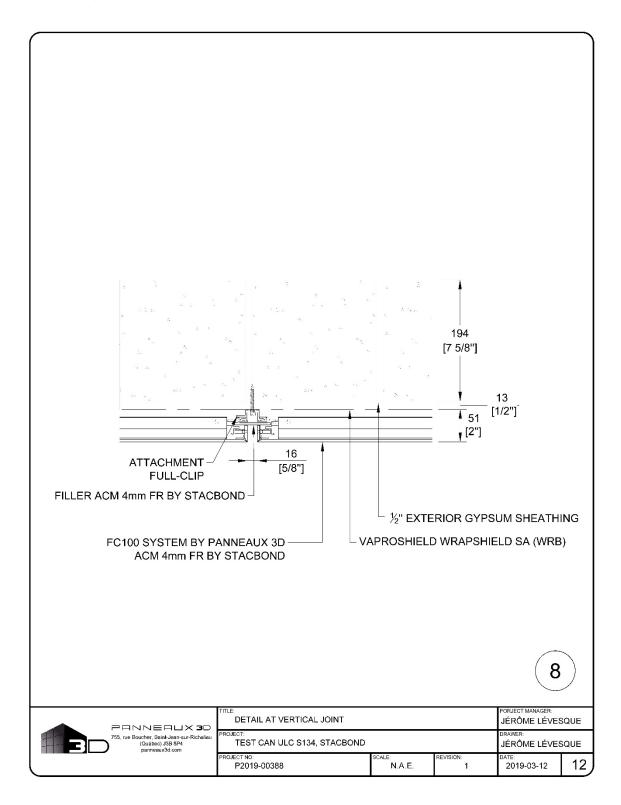




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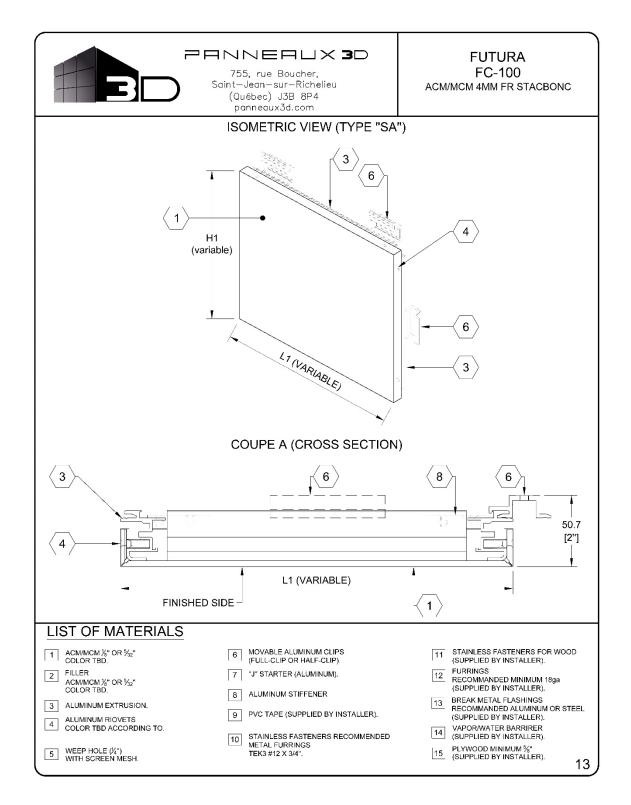




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SECTION 15

REVISION LOG

| REVISION # | DATE | PAGES | REVISION |
|------------|----------|-------|-----------------------|
| 0 | 06/17/19 | N/A | Original Report Issue |
| | | | |