

TEST REPORT

AAMA 509-14

REPORT NO.: 11123.02-106-11

RENDERED TO: DESANA PARTNERS
Cranston, Rhode Island

PRODUCT TYPE: Brick Rainscreen System (without mortar)

SERIES / MODEL: RWD

SYSTEM CLASSIFICATION: V13 / W1

Test Date: 1/19/2022
Through: 1/20/2022
Report Date: 2/21/2022
Retention End Date: 1/20/2026

CLIENT INFORMATION: DESANA PARTNERS
68 Fox Run
Cranston, Rhode Island 02920

TEST LABORATORY: Molimo, LLC
1410 Eden Road
York, Pennsylvania 17402
717-900-6034

PROJECT SUMMARY:

PRODUCT TYPE: Brick Rainscreen System (without mortar)

SERIES/MODEL: RWD

PROJECT SUMMARY:

Molimo, LLC was contracted to perform testing on the above referenced product. The results are tested values and were secured by using the designated test method. The specimen tested achieved the following ratings:

System Property	System Rating
Ventilation Rating	V13
Water Penetration Rating	W1

PROJECT DETAILS:

Test Dates: 1/19/2022 – 1/20/2022

Test Record Retention End Date: 1/20/2026

Test Location: Molimo, LLC test facility in York, Pennsylvania.

Test Specimen Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Molimo for a minimum of four years from the test completion date.

Drawing Reference: The test specimen drawings were supplied by the client. The test specimen construction was verified by Molimo and was found to be representative of the product tested. Test specimen drawings are located in Appendix B of this report. Any deviations are documented herein or on the drawings.

WITNESSES:

The following representatives witnessed all or part of the testing.

Name	Company
Michael D. Stremmel, P.E.	Molimo, LLC
Robert J. Beatty	Molimo, LLC

TEST METHOD:

AAMA 509-14 – *Voluntary Test and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding Systems*

TEST SPECIMEN DESCRIPTION:
PRODUCT SIZES:

Overall Area: 5.9 m ² (64.0 ft ²)	Width		Height	
	Millimeters	Inches	Millimeters	Inches
Overall Size:	2438	96	2438	96

JOINT SIZES:

	Width		Height	
	Millimeters	Inches	Millimeters	Inches
Head Joint:	2438	96	2	1/16
Sill Joint:	2438	96	13	1/2
Joints: (35 Total)	3169	124-3/4	5	3/16

Note: The joint width and height referenced in the table above include the horizontal joint of one row of bricks as well as the vertical joints of one row of bricks.

TEST WALL CONSTRUCTION:

The 96" wide by 96" high test wall was constructed of 2x6 Spruce-Pine-Fir wood studs, spaced 16" on center inside a 2x12 Spruce-Pine-Fir wood buck. The stud wall was sheathed with 1/4" thick clear polycarbonate, sealed and secured to the exterior of the wall to simulate the sheathing and an air/water barrier. The wall panel system was installed onto the clear polycarbonate in a manner consistent with normal installation procedures.

The clear polycarbonate was calibrated to a pre-determined air leakage rate by drilling 1/8" diameter holes on the backside in a uniform pattern. All holes were applied to the polycarbonate such that an even pressure drop and leakage rate was present across the wall and in each quadrant. The exterior of the test unit was sealed to the wood buck with silicone.

TEST SPECIMEN DESCRIPTION: (Continued)
RAIN SCREEN PANEL CONSTRUCTION AND INSTALLATION:

Rainscreen Member	Material	Detail
Field clips	Aluminum	1-9/16" base by 3-3/8" high by 2-3/8" deep, 0.10" thick 6063-T66 extruded aluminum angles. The field clips were secured with two #10 x 2" self-tapping stainless-steel fasteners per clip fastened through the clip into the studs. The clips were located 32" on center (vertically) at each stud location.
Head clips	Aluminum	1-9/16" base by 6-1/4" high by 2-3/8" deep, 0.10" thick 6063-T66 extruded aluminum. The head clips were secured with four #14 x 2" self-tapping stainless-steel fasteners per clip fastened through the clip into the studs. The clips were located at the top of each stud.
Vertical rails	Aluminum	1-1/2" wide by 1-7/8" high by 96" long, L shaped, aluminum angle. The vertical rails were secured to the field and head clips, spaced 16" on center, with two #10 x 3/4" self-tapping hex head washer screws.
Horizontal rails	Stainless Steel	96" wide by 2-1/2" high by 5/8" deep formed stainless steel with a serrated edge (teeth) at the top edge. The horizontal trays were secured WO/W, #8 x 3/4" stainless-steel, self-tapping, Phillips head screws located 16" on center (horizontally) though the horizontal trays into the vertical profile.
Brick	Clay	7-5/8" wide by 2-1/4" high by 3/4" thick. The bricks were inserted into the serrated trays with a rubber mallet and Tremco Spectrum 2 Structural Silicone between the brick and the tray.

CAVITY DEPTH: 48 mm (1-7/8 in)

TEST PROCEDURE:

Prior to installation of the test specimen, a chamber tare reading was taken to establish the air flow through the buck/chamber arrangement. The clear polycarbonate was calibrated to a pre-determined air leakage of rate 0.12 cfm/ft² by drilling 1/8" diameter holes on the backside in a uniform pattern, making sure to create an even pressure drop and leakage rate across the entire wall and in each quadrant. The test specimen was then installed, and an air infiltration reading was taken, subtracting the initial tare and air leakage established through the defect holes, to obtain a net air infiltration reading through the cladding assembly.

Upon completion of the initial air measurements through the specimen, the system was prepared to determine air flow through the cladding elements. Each joint (head, jambs, sill, intermediate horizontal(s), and intermediate vertical(s)) was temporarily sealed using foam blocks and tape as required. A tare reading was performed, and each joint was subsequently tested to determine the air flow through each of the various joinery elements.

After air flow testing, water penetration testing was initiated. For the water penetration test, the tape was removed from all but the jamb joinery. This process provides for the determination of water penetration through the designed rain screen cladding elements; less the jamb conditions; which were intentionally omitted from the test results as they are considered non-standard conditions. For the purpose of this test, water penetration is considered to be any water that makes contact with the polycarbonate sheathing and is either collected in the gutter at the sill or penetrates the purposely designed defects that were drilled in the polycarbonate. The water was collected, measured by weight, and then converted to a unit of volume to draw comparisons between the various pressure levels tested.

After the completion of the water penetration testing protocol, the specimen was allowed to sit for several hours at test lab interior ambient conditions. The specimen was later evaluated to determine the amount of residual water that may have remained on the polycarbonate and/or the back of the specimen. The purpose of this was to achieve an understanding of the drying capability of the system.

TEST RESULTS: The temperature during testing was 17° C (63° F).

BASE WALL AIR LEAKAGE: (per ASTM E 283)

Test Pressure	Results	Allowable
75 Pa (1.57 psf)	0.6 L/s/m ² (0.12 cfm/ft ²)	0.6 L/s/m ² (0.11 cfm/ft ²) min. 0.7 L/s/m ² (0.13 cfm/ft ²) max.

Note 1: The calibrated air leakage of the base wall was achieved with 56-1/8" diameter holes drilled through the polycarbonate. All holes were evenly distributed in each stud cavity and were located 6" above the bottom and the midspan of the wall.

Note 2: This air leakage does not represent the actual air leakage of the installed system.

RAIN SCREEN SYSTEM AIR LEAKAGE: (per ASTM E 283)

Test Pressure	Results	Allowable
75 Pa (1.57 psf)	<0.3 L/s/m ² (<0.01 cfm/ft ²)	Report Only

Note 3: This air leakage rate represents the actual air leakage of the installed system.

VENTILATION CLASSIFICATION RESULTS:

Air Infiltration Testing: (per ASTM E 283)

Joint Location	Joint Leakage (cfm)
Head Joint	19.40
Sill Joint	213.90
Field Joints	1421.50

System Ventilation Classification:

Data	Head Joint	Sill Joint	Vertical / Horizontal Joint(s)	Total Ventilation ⁽³⁾ L/s (cfm)	Ventilation Rate ⁽⁴⁾ L/s/m ² (cfm/ft ²)
L/s (cfm) ⁽¹⁾	9.16 (19.40)	100.95 (213.90)	670.87 (1421.50)	790.98 (1654.80)	131.35 (25.86)
L/s/m (cfm/ft) ⁽²⁾	3.75 (2.43)	41.39 (26.74)	6.05 (3.91)	Not Required	Not Required

⁽¹⁾ Data for each element, Head / Sill / Horizontal(s) / Vertical(s), are expressed as L/s (cfm)

⁽²⁾ Data for each element is expressed per lineal mm or ft. of joint length as L/s/m (cfm/ft)

⁽³⁾ The total ventilation of the complete system expressed as L/s (cfm)

⁽⁴⁾ The total ventilation of the complete system per unit area of the system expressed as L/s/m² (cfm/ft²). This is used as the ventilation rating for the system (Reference Charts).

VENTILATION CLASSIFICATION: V13

TEST RESULTS: (Continued)
WATER PENETRATION CLASSIFICATION RESULTS:
Static Water Penetration: (per ASTM E 331)

Test	Pressure	Volume of Water Collected (oz)
Test #1	300 Pa (6.24 psf)	15.5
Test #2	577 Pa (12.0 psf)	6.3

Note 4: Water contacted the polycarbonate sheathing

Dynamic Water Penetration: (per AAMA 501.1)

Test	Pressure	Volume of Water Collected (oz)
Test #1	300 Pa (6.24 psf)	22.9
Test #2	577 Pa (12.0 psf)	63.0

Note 5: Water contacted the polycarbonate sheathing

System Water Penetration Classification:

Data	300 Pa (6.24 psf) Static	577 Pa (12.0 psf) Static	300 Pa (6.24 psf) Dynamic	577 Pa (12.0 psf) Dynamic	Total ⁽³⁾	Sum ⁽⁴⁾ mL/m ² (oz/ft ²)	Average ⁽⁵⁾ mL/m ² (oz/ft ²)
mL (oz) ⁽¹⁾	458 (15.5)	186 (6.3)	676 (22.9)	1864 (63.0)	3184 (107.7)	Not Required	Not Required
mL/m ² (oz/ft ²) ⁽²⁾	77.1 (0.24)	31.3 (0.10)	113.7 (0.36)	313.6 (0.98)	Not Required	536 (1.68)	134 (0.42)

⁽¹⁾ Results of each water test, expressed as mL (oz).

⁽²⁾ Results of each individual test per unit area of the system expressed as mL/m² (oz/ft²)

⁽³⁾ Total water collected of all four tests combined expressed as mL (oz)

⁽⁴⁾ Total water collected of all four tests per unit area of system expressed as mL/m² (oz/ft²).

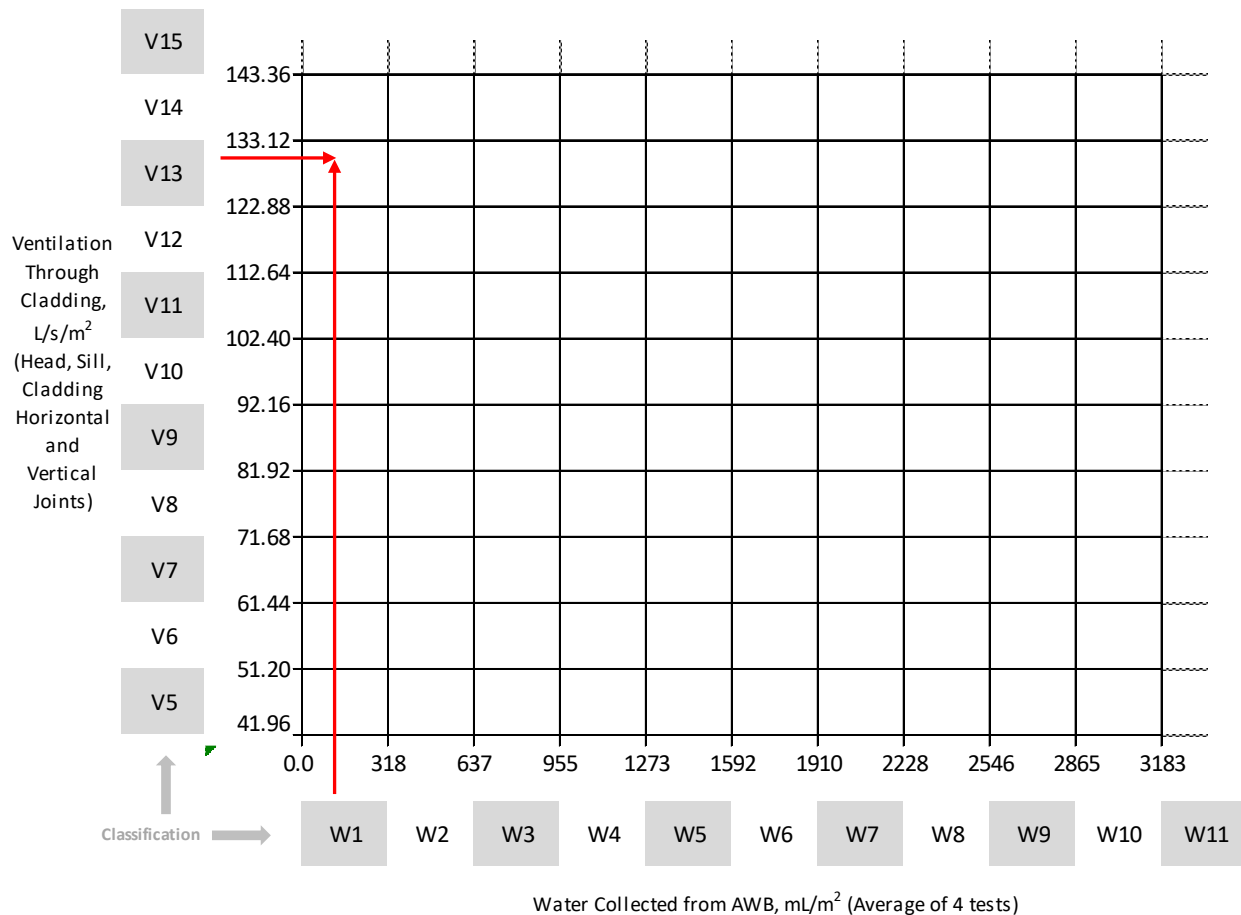
⁽⁵⁾ The average water collected for all four tests expressed as mL/m² (oz/ft²). This is used as the water penetration rating for the system (Reference Charts).

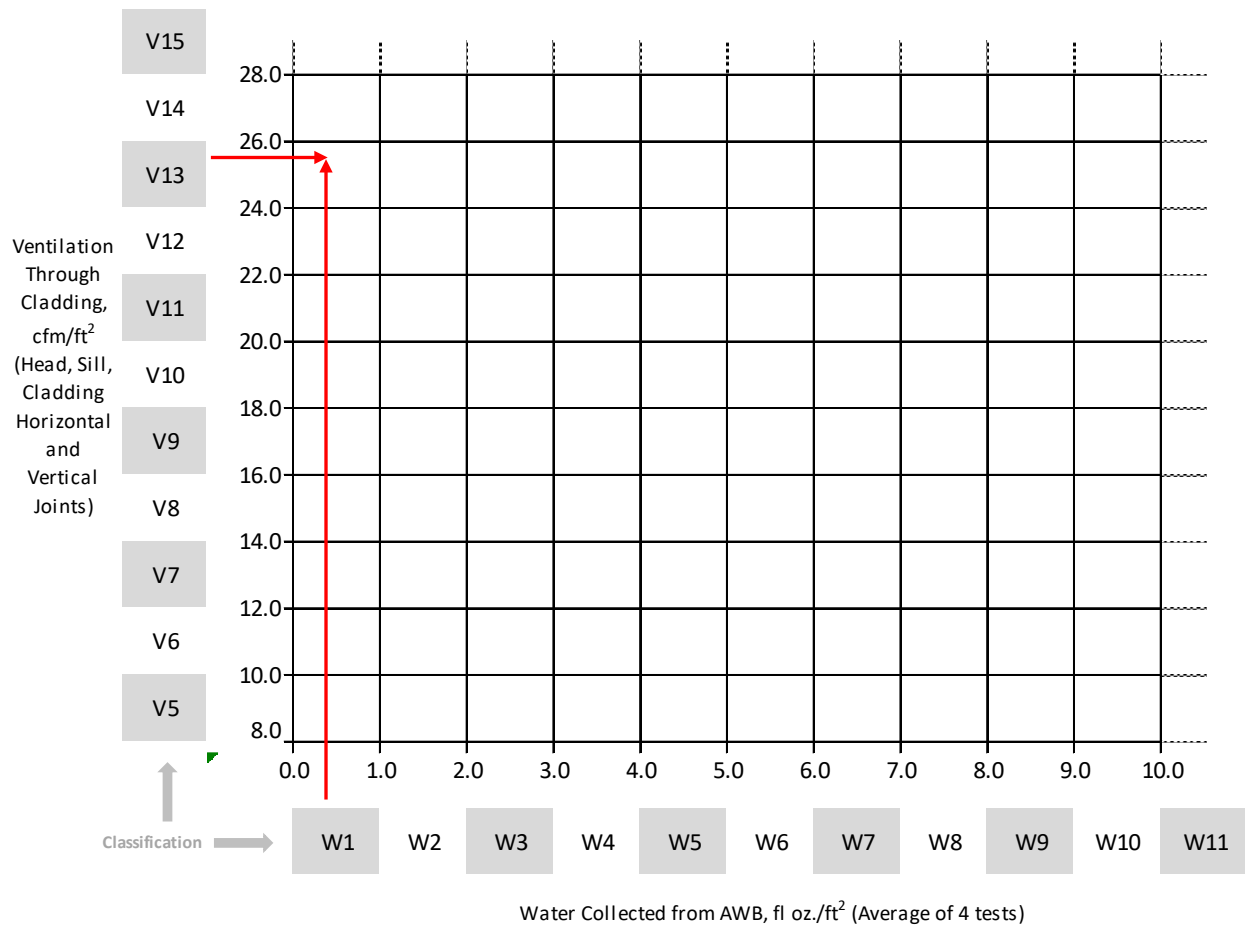
WATER PENETRATION CLASSIFICATION: W1

General Note: Upon examination of the specimen several hours after testing, the specimen was found to have allowed for drying and did not trap water.

TEST RESULTS: (Continued)
CLASSIFICATION CHARTS:

Based on the results of the air flow across the cladding and the water collected after contacting the polycarbonate AWB, the system tested achieved a V13/W1 Classification. The following Charts are used to plot the results of the test.

Chart #1: System Classification Chart (SI Units)


TEST RESULTS: (Continued)
CLASSIFICATION CHARTS:
Chart #2: System Classification Chart (IP Units)


General Note: All testing was performed in accordance with reference test methods. This report is not intended as a comprehensive evaluation of the system regarding performance and application to specific buildings.

A copy of this report, detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Molimo, LLC for the entire test record retention period. At the end of this retention period, the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. This test 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 permission of Molimo, LLC.

For MOLIMO, LLC:

Robert J. Beatty
Project Manager – Product Testing

Michael D. Stremmel, P.E.
Senior Project Engineer

RJB:mds

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

Appendix-A: Photographs (1)

Appendix-B: Drawings (4)

Appendix A

Photographs

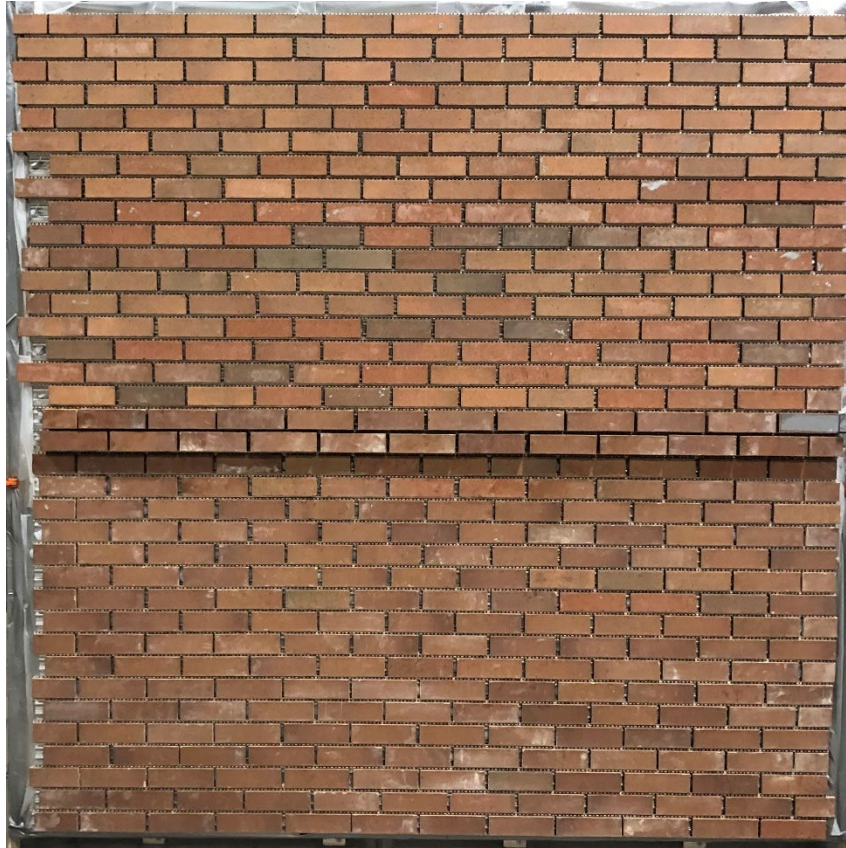
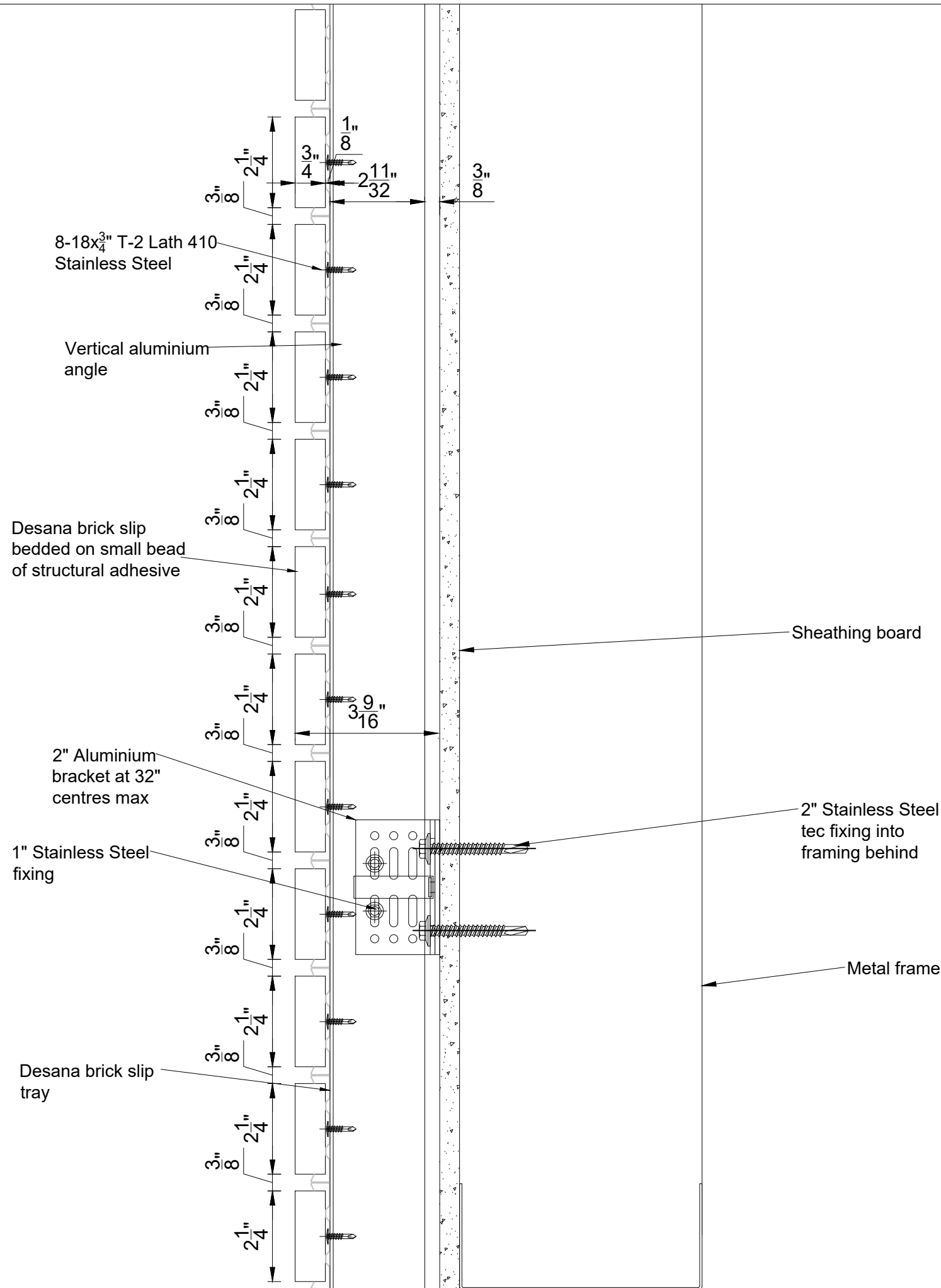


Photo 1
Brick Rainscreen System (without mortar)

Appendix B

Drawings

ALL ELEVATIONS ARE VIEWED FROM OUTSIDE
UNLESS OTHERWISE STATED



Rev.	Date	By	Comments
-	04-02-22	CDB	Approval
Drawing Status :			
FOR INFORMATION			
Contract :			
Desana Brick Slip Test Rig			



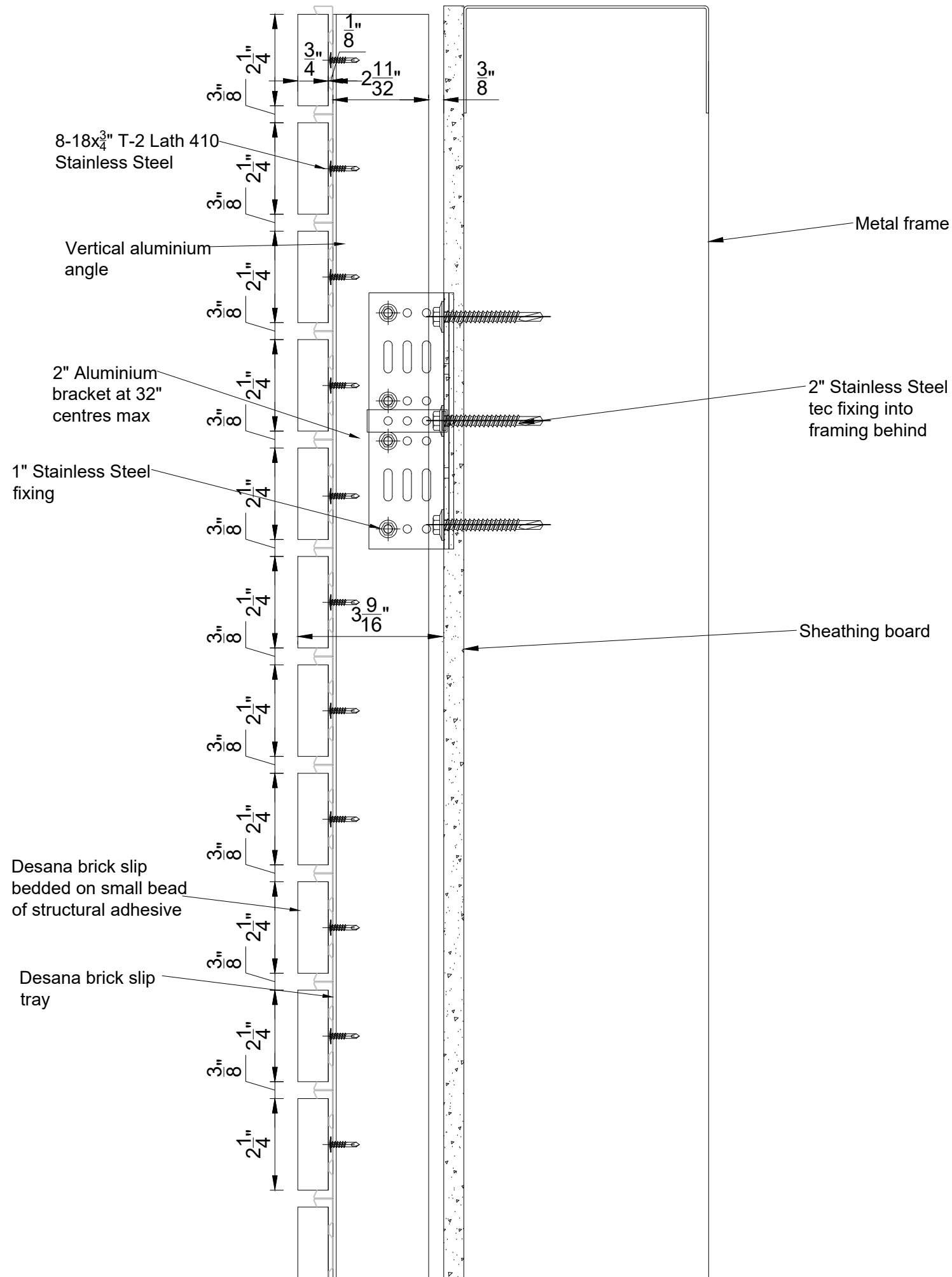
Do not scale from this drawing. If in doubt ask			
Drawing Title :			
Vertical section detail through Desana brick slip base			
Scale :	Checked :	Drawn : CB	
1:3	Date :	Date : 04-02-22	
Size	Drawing No.	Rev.	
A3	DEN-TR-DT-001	/	

MolimoTM
Architectural Product Testing

Report #: 11123.01-106-11

Date: 2/21/2022

By: M. Stremmel



Rev.	Date	By	Comments
-	04-02-22	CDB	Approval

Drawing Status :

FOR INFORMATION

Contract :

Desana Brick Slip Test Rig



Do not scale from this drawing. If in doubt ask

Drawing Title :

Vertical section detail through Desana brick slip head

Scale :	Checked :	Drawn :
1:3	Date :	Date : 04-02-22

Size	Drawing No.	Rev.
A3	DEN-TR-DT-002	/

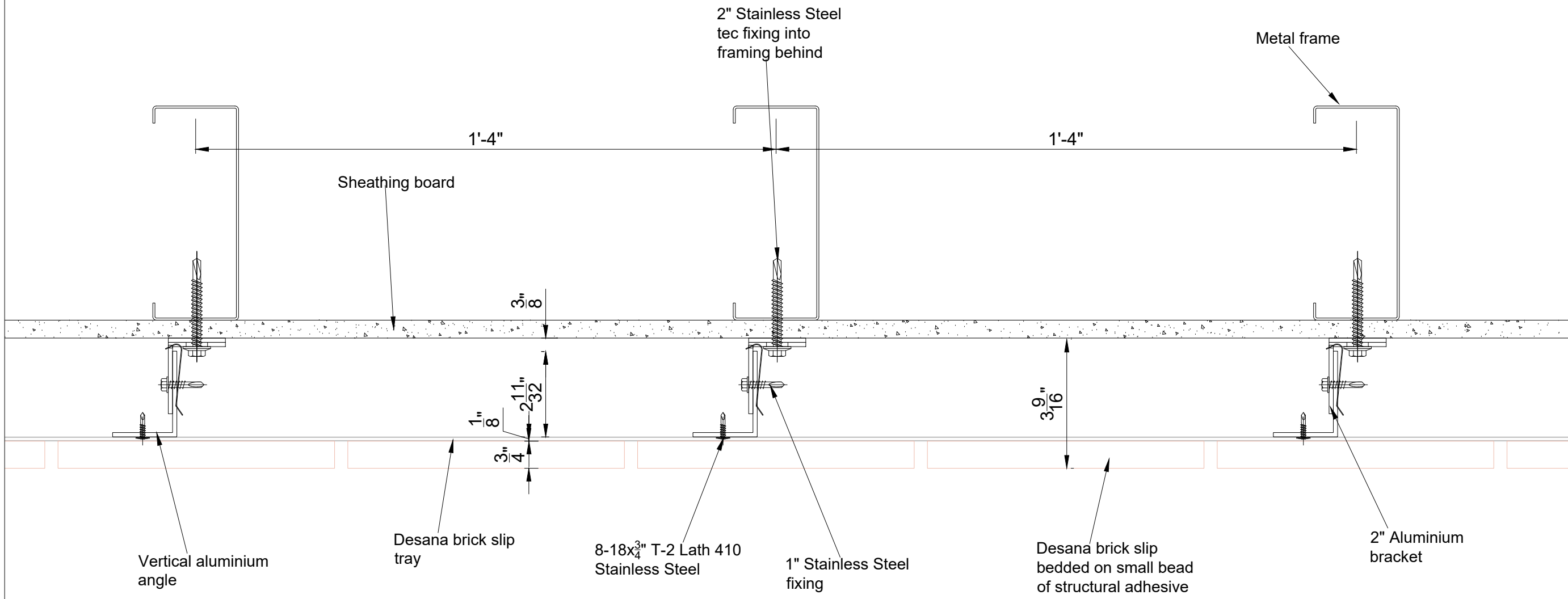
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Rev.	Date	By	Comments
-	04-02-22	CDB	Approval
Drawing Status :			
FOR INFORMATION			
Contract :			
Desana Brick Slip Test Rig			



Do not scale from this drawing. If in doubt ask		
Drawing Title :		
Horizontal section detail through Desana brick slip		
Scale :	Checked :	Drawn : CB
1:3	Date :	Date : 04-02-22
Size	Drawing No.	Rev.
A3	DEN-TR-DT-003	/

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Architectural Product Testing

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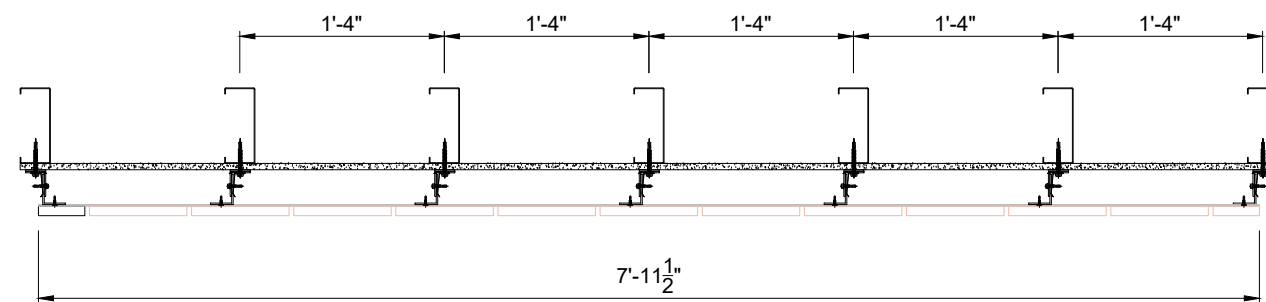
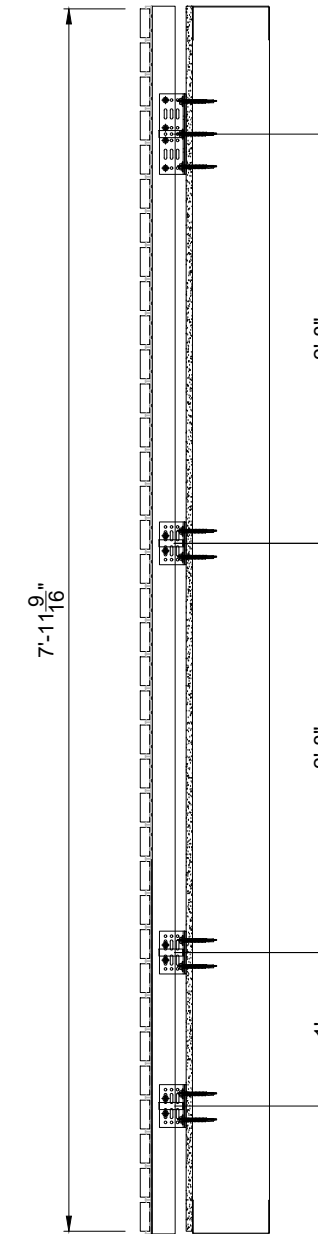
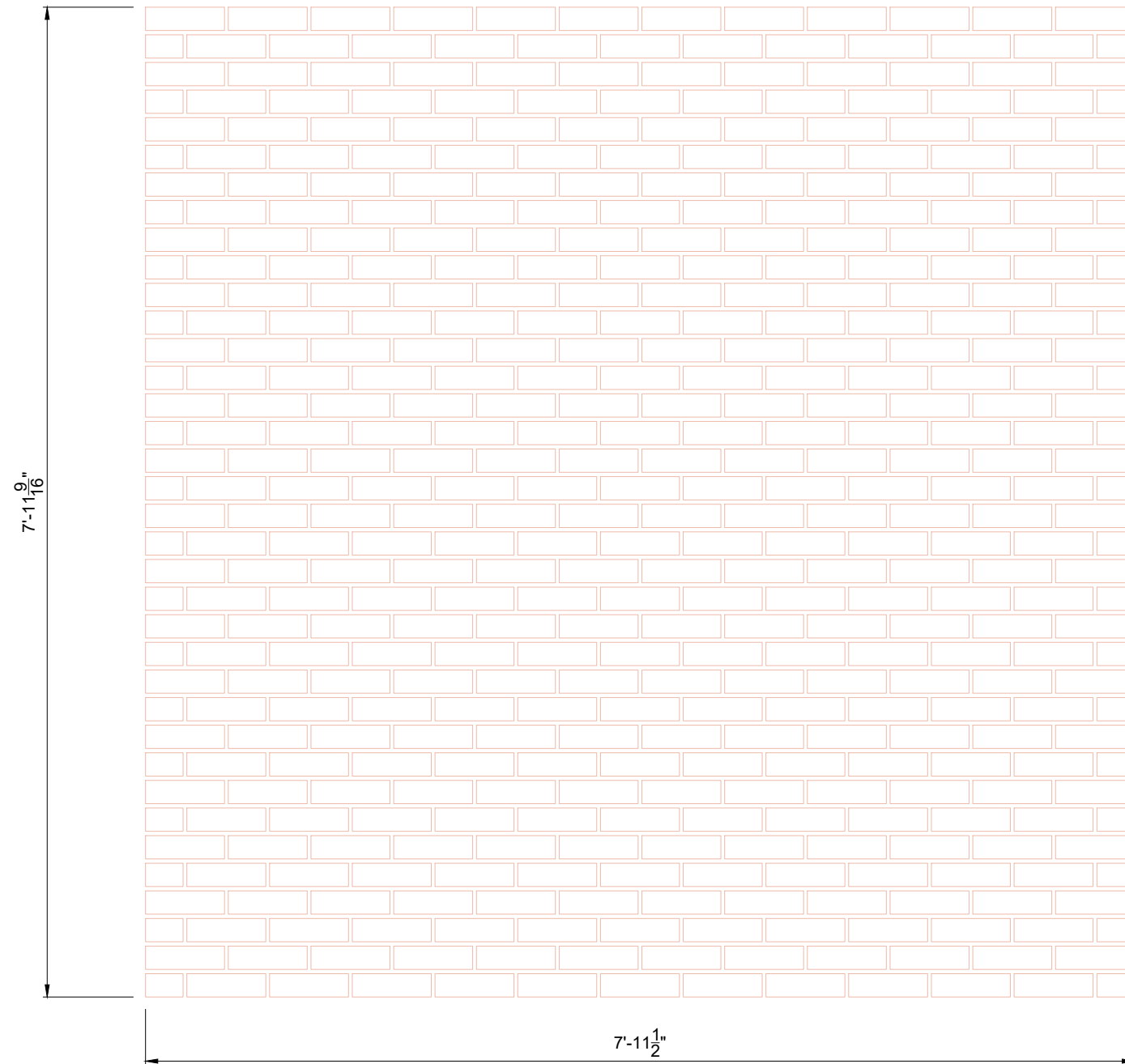
By: M. Stremmel

ALL ELEVATIONS ARE VIEWED FROM OUTSIDE
UNLESS OTHERWISE STATED

Brackets to be spaced at 32"
centres max

Vertical rails space at 16"
centres max

Bricks to be stack bonded
 $7\frac{5}{8} \times 2\frac{1}{4} \times \frac{3}{4}$ "



Rev.	Date	By	Comments
-	04-02-22	CDB	Approval

Drawing Status :

FOR INFORMATION

Contract :
Desana Brick Slip Test Rig




Do not scale from this drawing. If in doubt ask

Drawing Title :
Elevation setting out to Desana
Brick slip open joints

Scale :	Checked :	Drawn :
1:7.5	Date :	CB
		Date : 04-02-22

Size	Drawing No.	Rev.
A1	DEN-TR-EL-001	/



MolimoTM
Architectural Product Testing

Report #: 11123.01-106-11

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By: M. Stremmel