

CLIENT: Siber Facade Group
230-7270 Market Crossing
Burnaby, British Columbia
V5J 0A2
Canada

Test Report No: BUR0125-DW-b	Issue Date: January 16, 2024
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SAMPLE ID: Siber Facade Group Alpine HD Aluminum Tilt and Turn Window.

SAMPLE DESCRIPTION: Width: 1200 mm; Height: 1800 mm. See pages 6-7 for full description.

SAMPLING DETAIL: Test sample from Siber Facade Group was submitted directly to QAI.

DATE OF RECEIPT: Test sample was received on January 11, 2024.

TESTING PERIOD: Testing was conducted January 12 – January 16, 2024.

TESTING LOCATION: QAI Laboratories Ltd., Burnaby, BC, Canada.

AUTHORIZATION: Proposal #23MT07263, signed by Andrew Pushka dated July 26, 2023.

TEST PROCEDURE: Testing was performed following the methods and requirements outlined in the following standards:
AAMA/WDMA/CSA 101/I.S.2/A440-22 NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights.
CSA A440S1-19 – Canadian Supplement to NAFS 2017.

TEST RESULTS: Alpine HD Aluminum Tilt and Turn Window
Class CW - PG65: Size tested 1200 x 1800 mm (~47 x 71 in) – Type DAW

Detailed test results and product ratings are available on pages 4-5.

CONTENTS: Test Report pages 1 through 31.

Prepared By

Robbie Manuel

**Robbie Manuel
Project Manager**

**Signed for and on behalf of
QAI Laboratories, Ltd**



**Neil Dumont
Fenestration Reviewer**

Table of Contents

TEST CONDITIONS:	3
PRODUCT RATINGS:	4
Table 1: Summary of Test Results	4
Table 2. Product Classification.....	5
Table 3. Product Description.....	6
CONCLUSION / FINDINGS:.....	7
APPENDIX A.....	8
Elevation Drawing	9
Cross-Section Assembly Drawing.....	10
Dimensioned Die Drawings.....	12
Sample Photographs.....	16
REPORT REVISION HISTORY	31

TEST CONDITIONS:

AAMA/WDMA/CSA 101/I.S.2/A440-22 NAFS and CSA A440S1-19

QAI Laboratories Ltd. (QAI) was retained by Siber Facade Group to perform testing in accordance with the mandatory test requirements of AAMA/WDMA/CSA 101/I.S.2/A440-22 NAFS and CSA A440S1-19 on a representative sample of a 1200 mm x 1800 mm Alpine HD Aluminum Tilt and Turn Window.

This report includes tests performed on a specimen of specific dimensions. Actual product performance may be affected by variations in the windows dimensions, assembly details and installation method. The drawings supplied by the client were verified by QAI for the window unit tested and are shown in Appendix A.

Installed by: Siber Facade Group

Installation details:

- Three aluminum L-angles are inserted into the outermost T-slot of the exterior aluminum frame component. A 1000 mm length is used along the head and a 1600 mm length is used along each jamb.
- The L-angles are fastened to the test buck with #10 x 2" self-tapping panhead screws through pre-punched holes spaced 157 mm apart along the head and 171 mm apart along each jamb.
- Four lengths of 1/4" foam backing rod were used around the perimeter of the window frame.
- Silicone was applied between the window frame and test buck on the interior side.

Wooden test buck details:

- Inner frame: nominal 2" x 6" stud framing.
- Outer frame: nominal 2" x 12" stud framing.
- Rough opening: The rough opening is 1/2" larger in width and 1" larger in height than the test specimen.
- Shims: Two 1/4" thick plastic Y-shaped shims were placed at the sill, each centered 4" from the outer edge of either jamb.

PRODUCT RATINGS:

Table 1: Summary of Test Results

Test Name	AAMA/WDMA/CSA 101/I.S.2/A440-22 NAFS and CSA A440S1-19 Results:
Operating Force Test (Clause 8.3.1)	Pass
Air Leakage (ASTM E283)	Test pressure = 75 Pa Infiltration = 0.116 L/s/m ² (0.023 cfm/ft ²) Exfiltration = 0.109 L/s/m ² (0.021 cfm/ft ²) Overall result – Pass CW class requirements Test pressure = 300 Pa Infiltration = 0.232 L/s/m ² (0.046 cfm/ft ²) Exfiltration = 0.217 L/s/m ² (0.043 cfm/ft ²) Reported only
Water Penetration (ASTM E547)	Maximum pressure differential = 720 Pa (DP 100 – 15.04 psf) ¹
Uniform Load Deflection (ASTM E330 – Procedure A)	Design Pressure = 4560 Pa (DP 95) Maximum pressure differential = 4680 Pa (97.74 psf) L/175 Deflection limit for CW class = 10.3 mm (0.406") Deflection at pressure = 2.3 mm (0.090") Deflection measured along the locking stile.
Uniform Load Structural (ASTM E330 – Procedure A)	Design pressure = 3120 Pa (DP 65) Maximum pressure differential = 4680 Pa (97.74 psf)
Forced Entry Resistance Test (ASTM F588-17)	Grade 10 – Pass
Awning, Hopper, Projected Hardware Load Test (Clause 8.3.6.6)	Load applied = 140 N (31.47 lbf) Deflection at full load = 7.2 mm (0.280") Net deflection limit for CW class = 76.2 mm (2.999") Overall result – Pass

¹ The window frame was sealed to the test buck along the entire perimeter on the interior side and was not evaluated for water penetration at the frame corner joints and their fastening screws.

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Table 2. Product Classification

Alpine HD Aluminum Tilt and Turn Window	
Maximum Size Tested:	1200 mm wide x 1800 mm tall (~47 x 71 in)
Performance Classification:	CW
Performance Grade:	PG65
Product Type:	DAW
Primary Designator: Class CW - PG65: Size tested 1200 x 1800 mm (~47 x 71 in) – Type DAW	
Secondary Designator: Positive ASD Design Pressure (DP) = 3120 Pa (65.16 psf) Negative ASD Design Pressure (DP) = -3120 Pa (-65.16 psf) Water Penetration Resistance Test Pressure = 720 Pa (15.04 psf) Air Infiltration / Exfiltration = Pass	

Notes:

- *AAMA/WDMA/CSA 101/I.S.2/A440-22 NAFS*, Clause 8.2.4: The air, water, and structural tests required by this Standard/Specification are performed on test specimens installed in a fixture that permits installation in accordance with the manufacturer’s documented instructions. These tests are used to evaluate the performance of the fenestration product only and are not intended to test the performance of the installation, particularly the perimeter sealants between the fixture and the test specimen and the anchoring of the test assembly to the test fixture.

- Products not installed according to the installation method described in this report may not perform to an equivalent performance level.

Table 3. Product Description

Alpine HD Aluminum Tilt and Turn Window		
Frame:	Description:	Thermally broken insulated aluminum frame profile. Frame dimensions: Width: 1200 mm; Height: 1800 mm.
	Joints:	Mitre cut and sealed with silicone at the joining faces. Two aluminum corner keys per corner joint. One corner key inserted into both the interior and exterior aluminum frame components and sealed in place with silicone.
	Insulation:	Rigid insulation used in the thermal break cavity and on the rough opening side of the thermal break.
Sash:	Description:	Thermally broken insulated aluminum sash profile. Sash dimensions: Width: 1143 mm; Height: 1742 mm.
	Joints:	Mitre cut and sealed with silicone at the joining faces. Two aluminum corner keys per corner joint. One corner key inserted into both the interior and exterior aluminum sash components and sealed in place with silicone.
	Insulation:	Rigid insulation used in the thermal break cavity.
Weather-stripping:	Frame:	Four strips of weather-stripping (Gasket Code 200 168) around the perimeter of the frame, inserted into the inner-most T-slot of the exterior aluminum frame component, corners are mitre cut and sealed with silicone. Four lengths of weather-stripping (Gasket Code 200 157) used around the perimeter of the frame, inserted into the middle T-slots of the frame profile. Corners are butt joined and sealed with silicone.
	Sash:	One length of weather-stripping (Gasket Code 200 160) around the perimeter of the sash, inserted into the outer-most T-slot of the interior aluminum sash component and wrapped around corners. Butt joint located on the hinge stile, 6-3/4" from the outer edge of the top rail, no silicone was used.
Glazing Method:	Interior Seal: (Glazing Bead and Gasket)	Aluminum glazing bead profile. Four strips of glazing bead used around the sash perimeter; butt joined at corners. Four lengths of rubber glazing gasket (Gasket Code 200 162) inserted between the glazing bead and IGU; butt joined at corners.
	Glazing Foam:	Four lengths of glazing foam were inserted between the sash and IGU.
	Full Bead	A full silicone bead was applied around the perimeter of the IGU on the interior side.
	Exterior Seal: (Glazing Gasket)	Four lengths of rubber glazing gasket (Gasket Code 200 158) inserted between the exterior aluminum sash component and IGU; mitre cut and sealed with silicone at corners.
	Setting Blocks:	Four 3-1/2" x 1" x 1/4" rubber setting blocks were used. <ul style="list-style-type: none"> • Top rail: One setting block centered 4" from the inside face of the locking stile. • Bottom rail: One setting block centered 2" from the inside face of the hinge stile. • Locking stile: One setting block centered 4" from the inside face of the top rail. • Hinge stile: One setting block centered 2" from the inside face of the bottom rail.
Glazing:	Description:	Three tempered glass panes with a thickness of 6 mm each. Overall IGU thickness: 43 mm.

Alpine HD Aluminum Tilt and Turn Window (continued)

Drainage:	Frame:	<u>Into the frame:</u> Three 1/2" x 1/4" drainage slots machined into the sill, centered 8", 23" and 39" from the outer edge of the locking jamb. <u>Out of the frame:</u> Five 1/2" x 1/4" drainage slots machined out of the sill, centered 6", 13", 20", 27", and 34" from the outer edge of the hinge jamb.
	Sash:	<u>Into the sash:</u> Three 1/2" x 1/4" drainage slots machined into the bottom rail, centered 6", 20", and 35" from the inside face of the hinge stile. <u>Out of the sash</u> Two 2" x 1/4" drainage slots machined out of the bottom rail, each centered 11" from the outer edge of either stile.
Hardware:	Locking System:	Multi-point locking system used around the perimeter of the sash. Secured to the sash with #6 x 3/4" countersunk machine screws. Amount of lock points and fasteners used are as follows: <ul style="list-style-type: none"> • Top rail – One lock point, no screws. • Hinge stile – Four lock points, four screws. • Locking stile – Five lock points, five screws. • Sill – Two lock points, two screws.
	Lever Handle Operator:	The lever handle is located 34" from the top edge of the sash and part of the multi-point locking system.
	Keepers:	Twelve keepers were used around the perimeter of the window frame. Each keeper was secured to the frame with one #12 x 3/8" set screw. Location of the keepers are as follows: <ul style="list-style-type: none"> • Head – One keeper centered 24" from the outer edge of the locking jamb. • Hinge jamb – Four keepers centered 7", 20", 34", and 48" from the outer edge of the sill. • Locking jamb – Five keepers centered 5", 16", 25", 47", and 55" from the outer edge of the sill. • Sill – Two keepers centered 20" and 33" from the outer edge of the locking jamb.
	Hinges:	Two stay arm hinges, one on each side at the head/top rail. Two casement hinges, one at the top/bottom of the hinge jamb/stile. The stay arm hinge at the hinge jamb side is integrated with the casement hinge at the head. The hinges are secured to the frame/sash as follows: <ul style="list-style-type: none"> • Frame side – All hinges are secured to the frame with two #12 x 3/8" set screws each. • Sash side – All hinges on the sash side are part of the multi-point locking system.

CONCLUSION / FINDINGS:

QAI Laboratories Ltd. has performed testing in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-22 NAFS and CSA A440S1-19 requirements, on a representative sample of a Siber Facade Group. Alpine HD Aluminum Tilt and Turn Window. Testing was performed at the Burnaby, BC location.

Test results in this report may not be reproducible in the field. Test results relate only to those products tested.

See Table 1 for a summary of test results and window ratings. The sample tested was found to comply with the applicable requirements and obtained test results as reported in Table 1 of this report.

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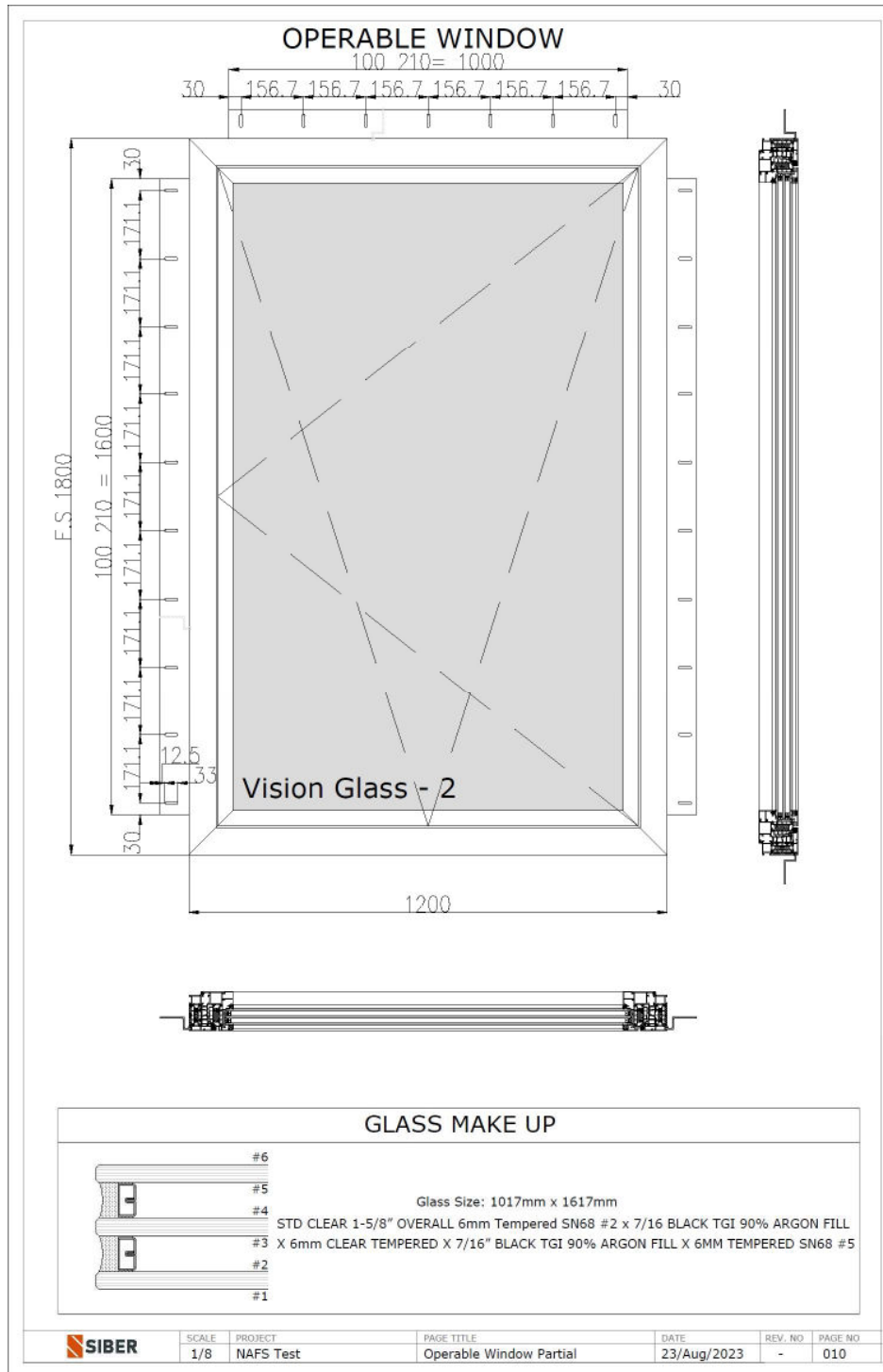
APPENDIX A
(Drawings and photographs specifications)

Page	Title
9	Elevation Drawing
10-12	Cross-Section Assembly Drawings
13-15	Dimensioned Die/Profile Drawings
16-31	Sample Photographs

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Elevation Drawing

Dimensions are in mm.

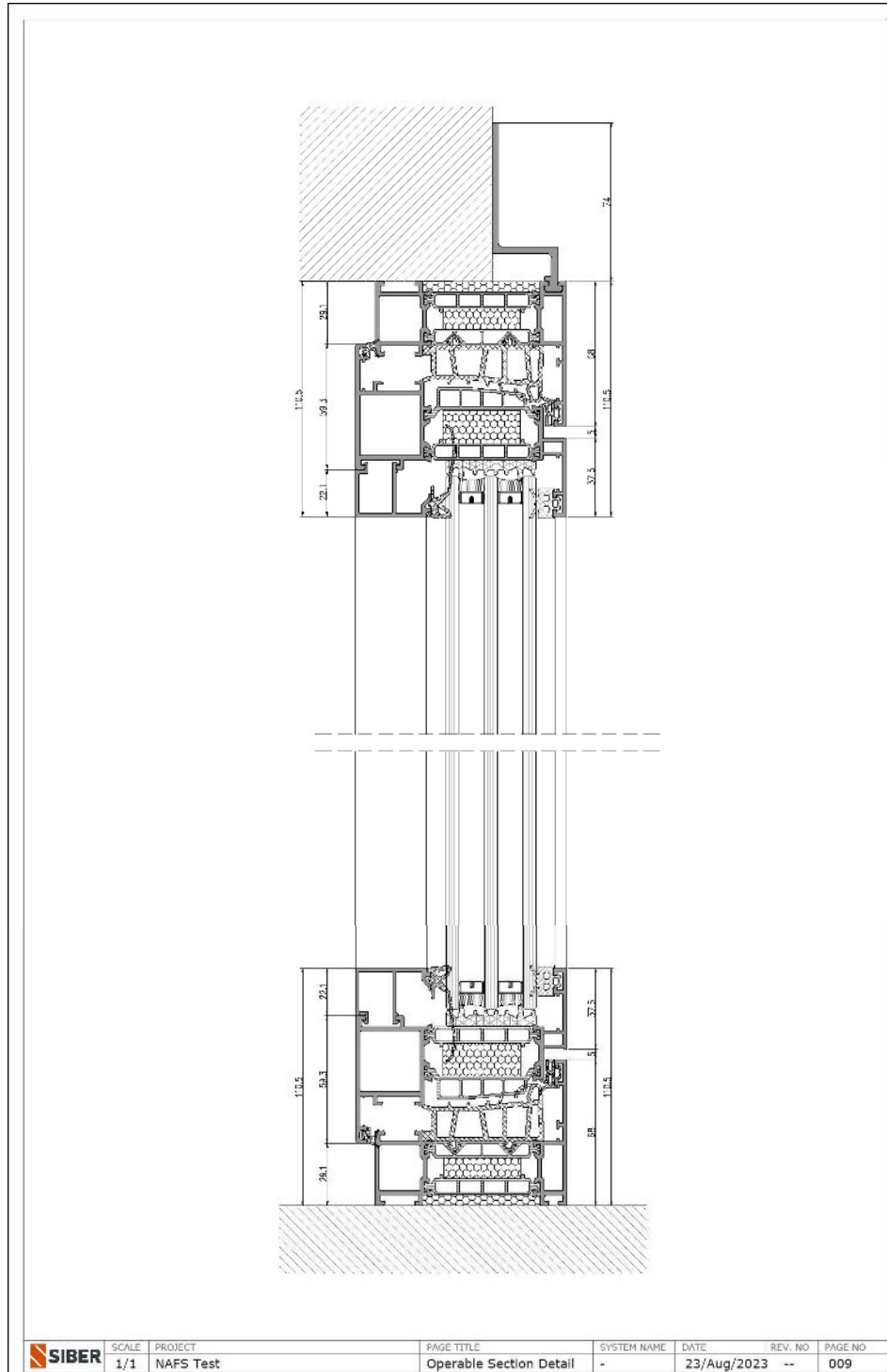


Alpine HD Aluminum Tilt and Turn Window – Elevation

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Cross-Section Assembly Drawing

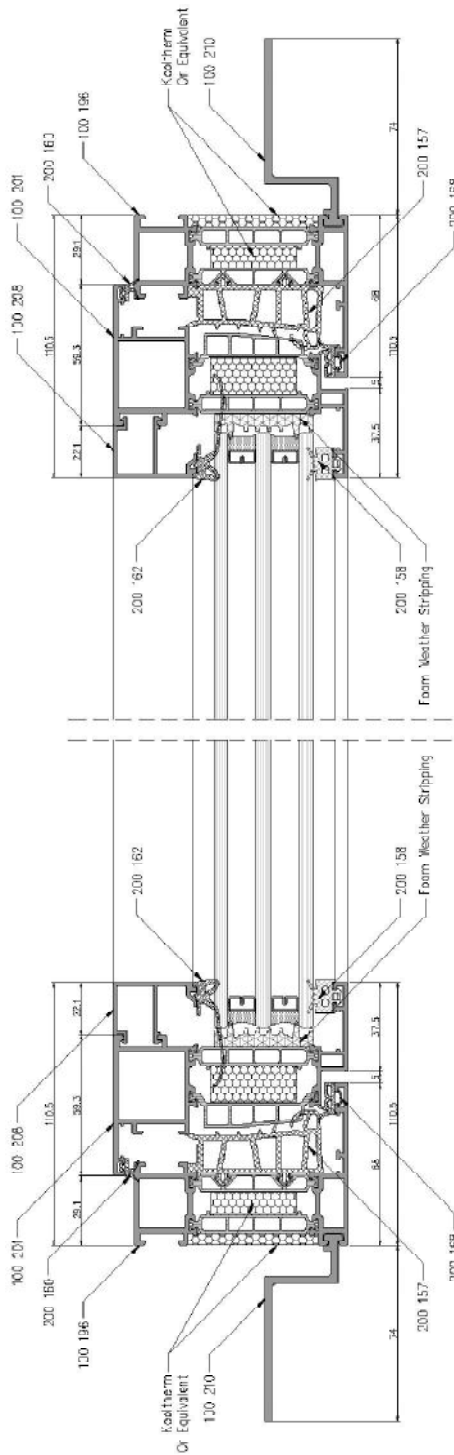
Dimensions are in mm.



Alpine HD Aluminum Tilt and Turn Window – Vertical Cross-Section Assembly

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Dimensions are in mm.



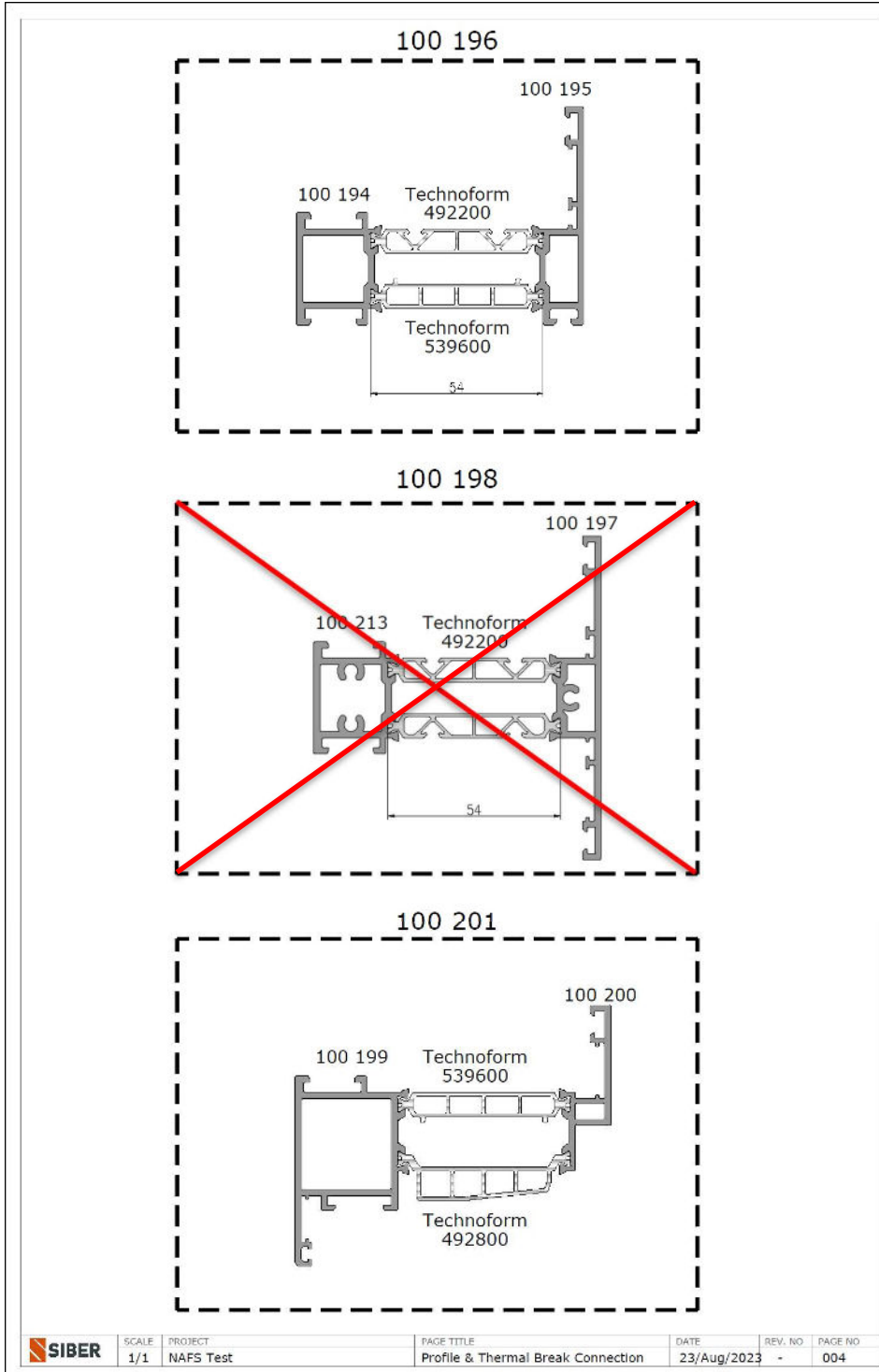
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<p>SIBER PAGE TITLE: Operable Plan Detail</p>					

Alpine HD Aluminum Tilt and Turn Window – Horizontal Cross-Section Assembly

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Dimensioned Die Drawings

Dimensions are in mm.



Alpine HD Aluminum Tilt and Turn Window – Frame and Sash Profiles

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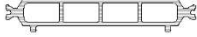

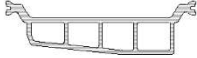

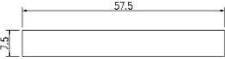
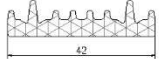
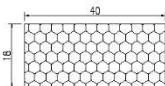
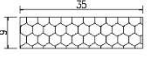
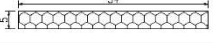

Dimensions are in mm.

Profile No	Profile Type	Material	Weight	Profile No	Profile Type	Material	Weight	Profile No	Profile Type	Material	Weight	Profile No	Profile Type	Material	Weight
Siber 100 194		EN AW 6063 - T5	0.703 Kg/m	Siber 100 200		EN AW 6063 - T5	0.515 Kg/m	Siber 100 213		EN AW 6063 - T5	0.820 Kg/m	Siber 100 215		EN AW 6063 - T5	4.899 Kg/m
JJTech 23-099-01				JJTech 23-103-01				JJTech 23-115-01							
Siber 100 195		EN AW 6063 - T5	0.768 Kg/m	Siber 100 201 [100 199] [100 200]		EN AW 6063 - T5	0.419 Kg/m	Siber 100 215		EN AW 6063 - T5	0.100 Kg/m	JJTech 23-114-01		EN AW 6063 - T5	4.899 Kg/m
JJTech 23-100-01				JJTech 23-103-01				JJTech 23-114-01							
Siber 100 196 [100 194] [100 195]		EN AW 6063 - T5	1.026 Kg/m	Siber 100 208		EN AW 6063 - T5	0.532 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m
JJTech 23-099-01				JJTech 23-108-01				Siber 100 105				Siber 100 105			
Siber 100 197		EN AW 6063 - T5	1.026 Kg/m	Siber 100 209		EN AW 6063 - T5	0.930 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m
JJTech 23-101-01				JJTech 23-109-01				Siber 100 105				Siber 100 105			
Siber 100 198 [100 197] [100 213]		EN AW 6063 - T5	1.021 Kg/m	Siber 100 210		EN AW 6063 - T5	1.543 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m
JJTech 23-101-01				Siber 100 211				Siber 100 105				Siber 100 105			
Siber 100 199		EN AW 6063 - T5	1.021 Kg/m	JJTech 23-111-01		EN AW 6063 - T5	5.728 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m	Siber 100 105		EN AW 6063 - T5	0.100 Kg/m
JJTech 23-102-01				Siber 100 212				Siber 100 105				Siber 100 105			

Alpine HD Aluminum Tilt and Turn Window – Aluminum Component Profiles

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Dimensions are in mm.

T.B Number	Thermal Break Shape	Material										
Technoform 539 600		POLYAMIDE										
Technoform 492 200												
Technoform 462 800												
Accessories List												
Monticelli		2401/250 (Will provide From Siber)										
Glazing Chair		Hard Plastic Or Polyamide										
Isolation		Foam Weather Stripping										
Isolation Sizes												
Isolation		Kooltherm Or Equivalent										
												
												
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PROJECT	PAGE TITLE	DATE	REV. NO	PAGE NO								
NAFS Test	Window Thermal Break & Accessories List	23/Aug/2023	--	003								

Alpine HD Aluminum Tilt and Turn Window – Thermal Break and Accessory Profiles

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Sample Photographs

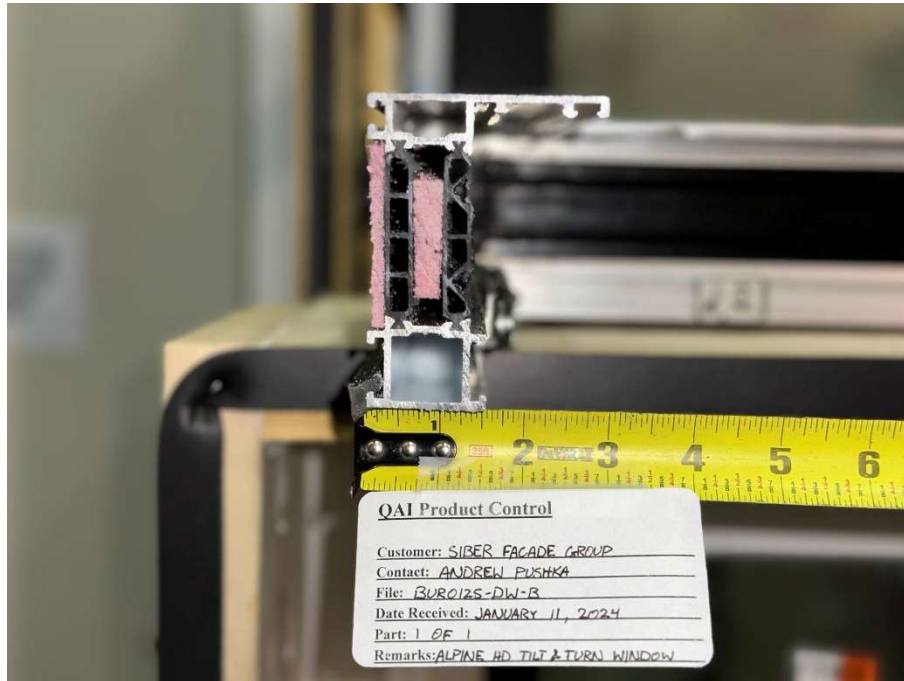


Figure 1: Frame.



Figure 2: Sash.

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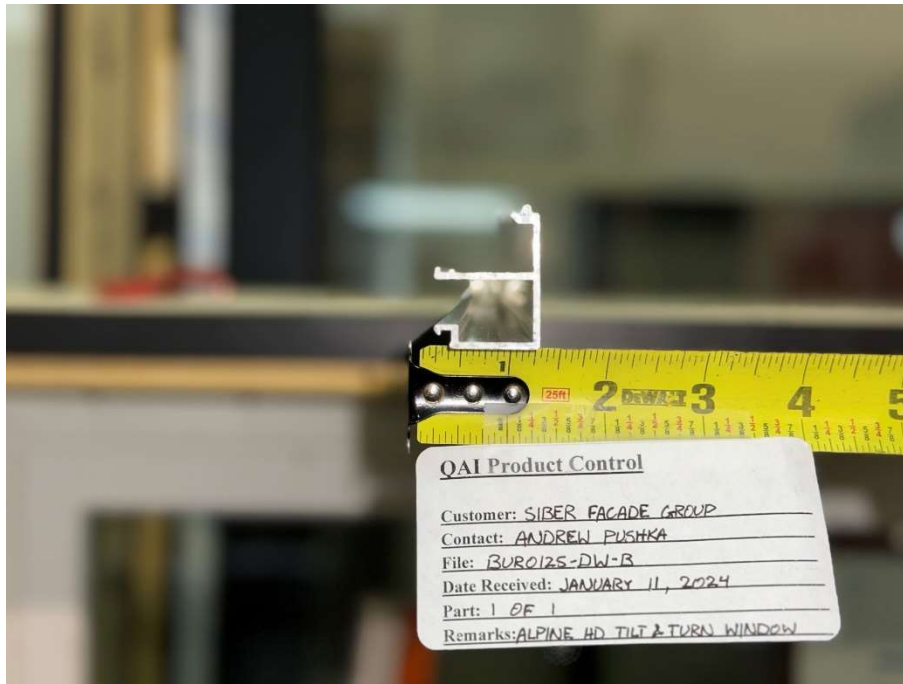


Figure 3: Glazing bead.



Figure 4: Glazing bead corner joint.

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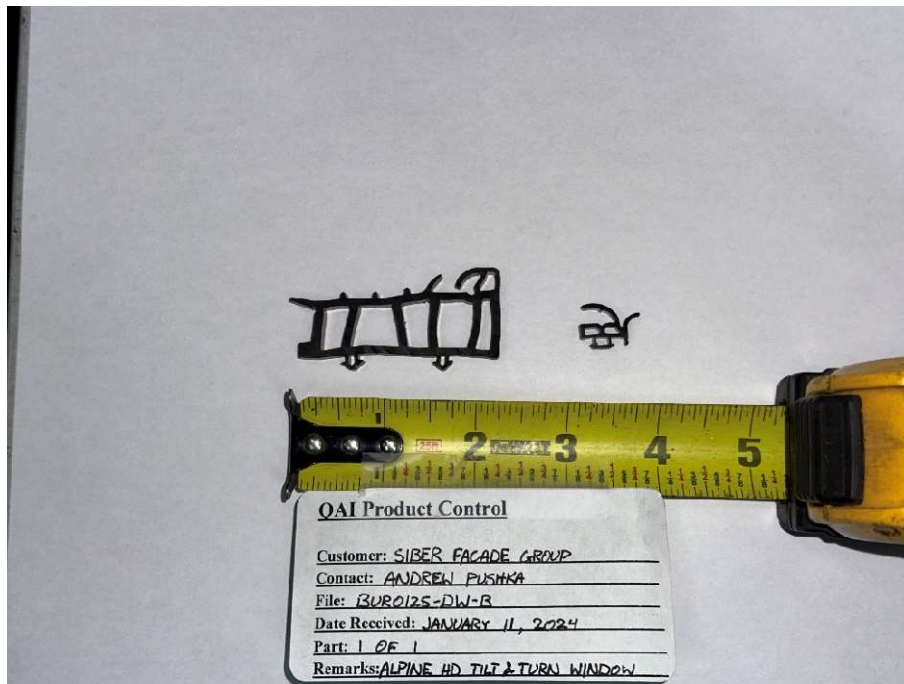


Figure 5: Weather-stripping gaskets - Frame.

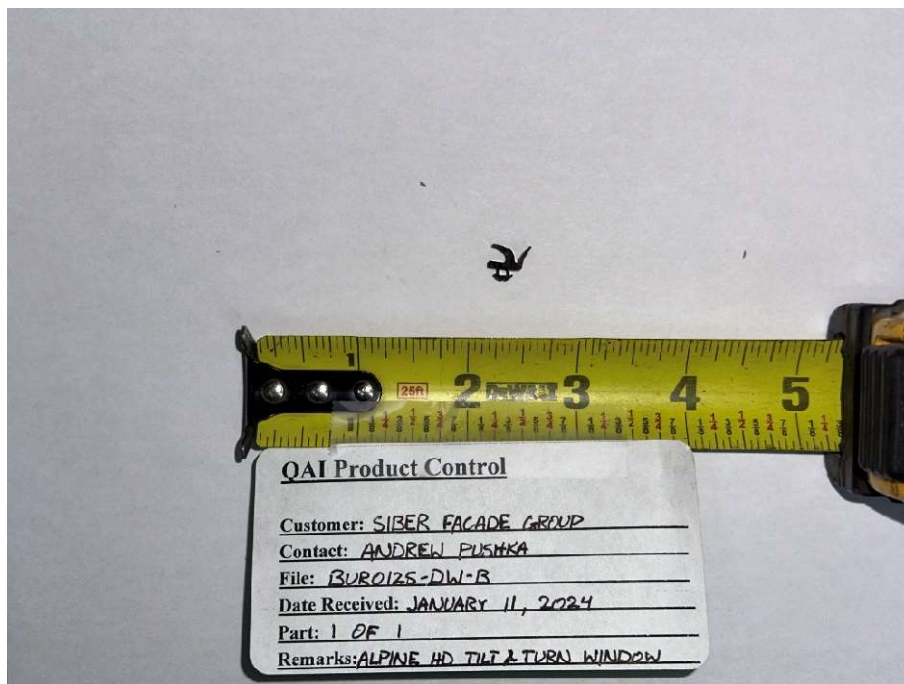


Figure 6: Weather-stripping gasket - Sash.

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Figure 7: Weather-stripping joints - Frame.

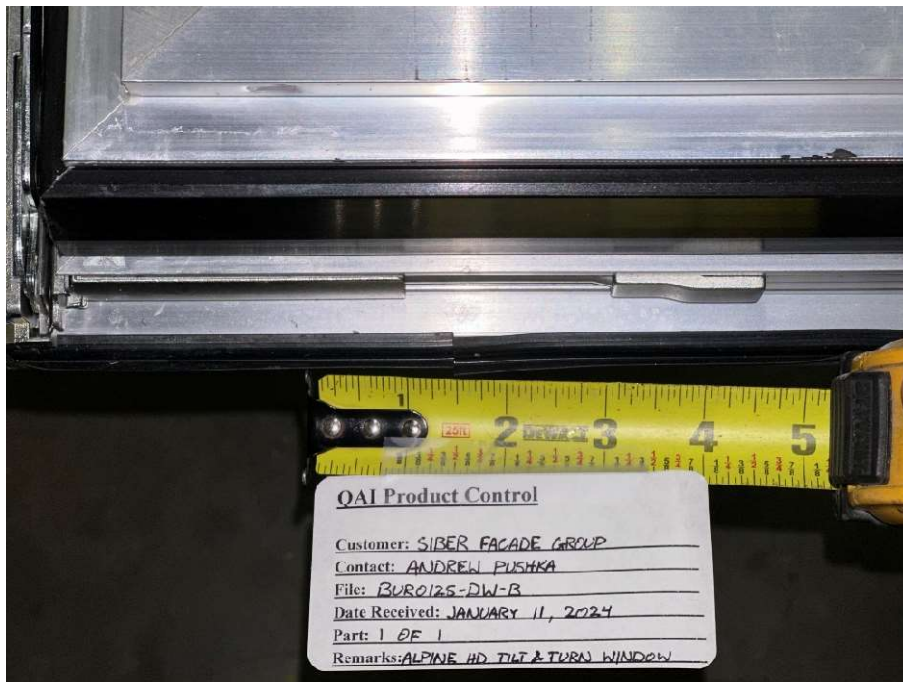


Figure 8: Weather-stripping joint - Sash.

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Figure 9: Interior glazing gasket.



Figure 10: Exterior glazing gasket.

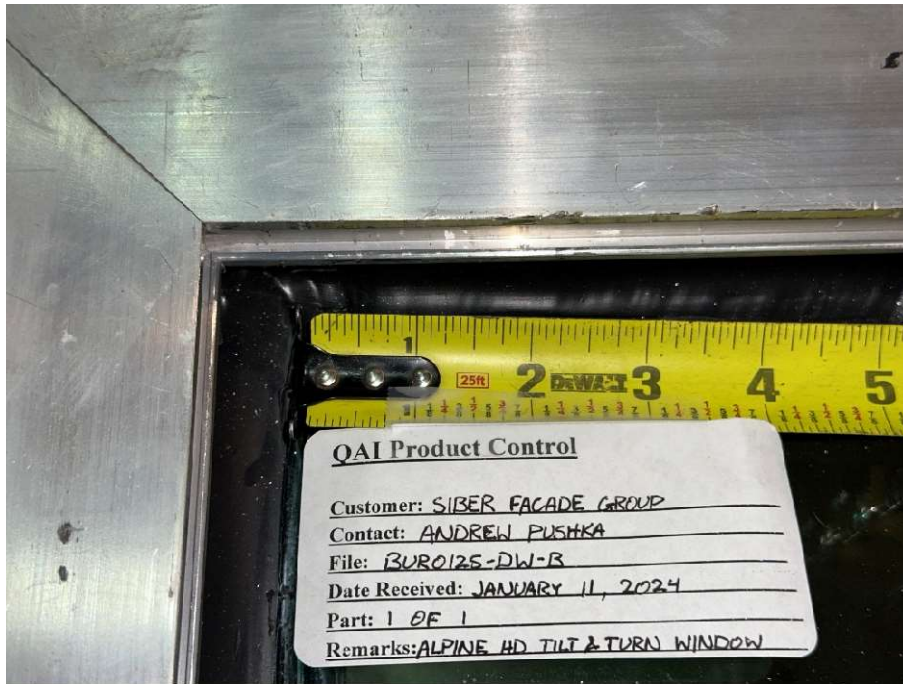


Figure 11: Full silicone bead.



Figure 12: Setting block.

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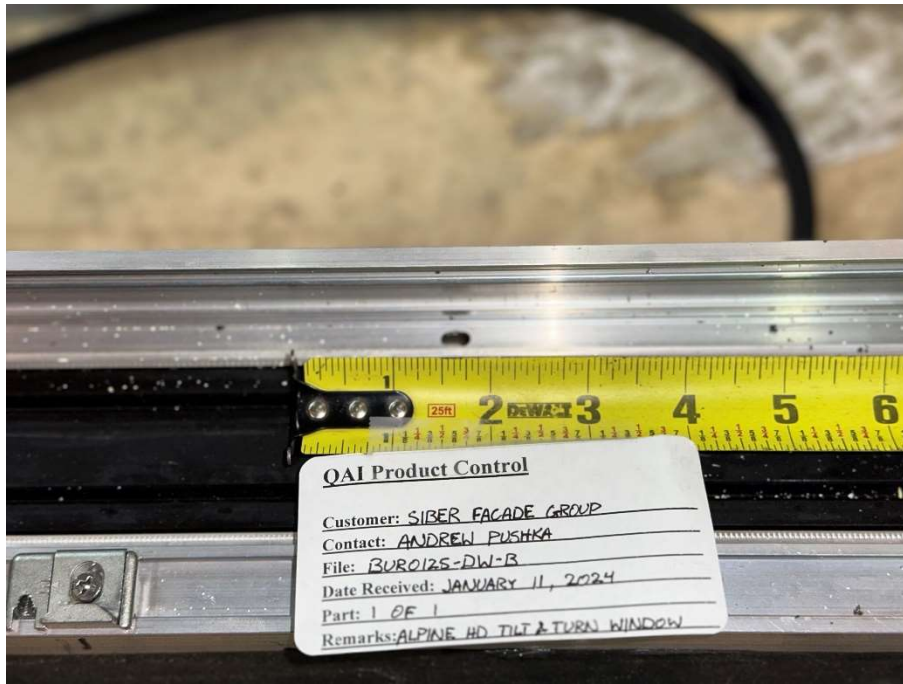


Figure 13: Drainage into the frame.

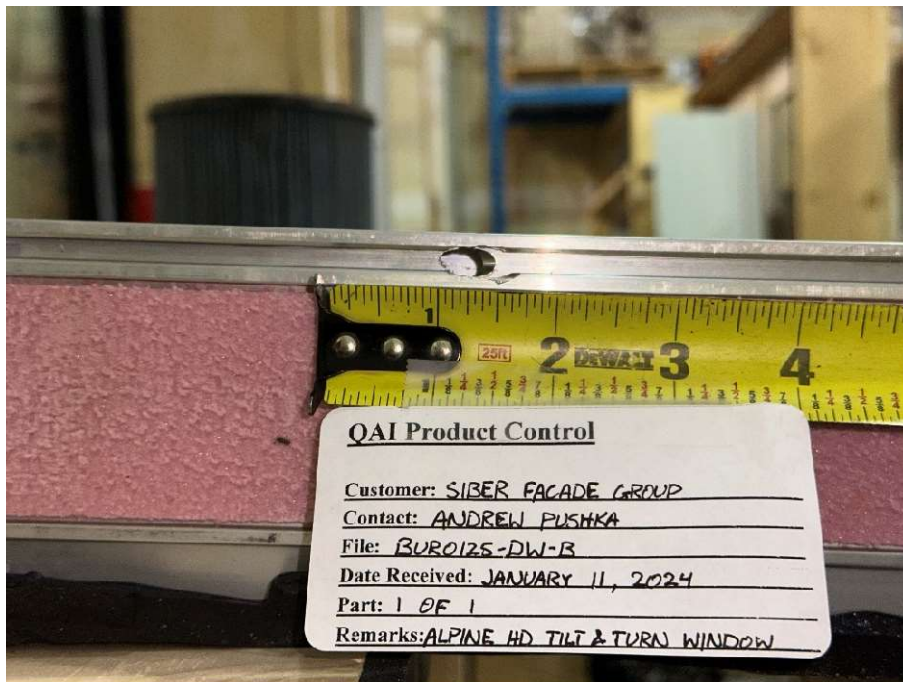


Figure 14: Drainage out of the frame.

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Figure 15: Drainage into the sash.

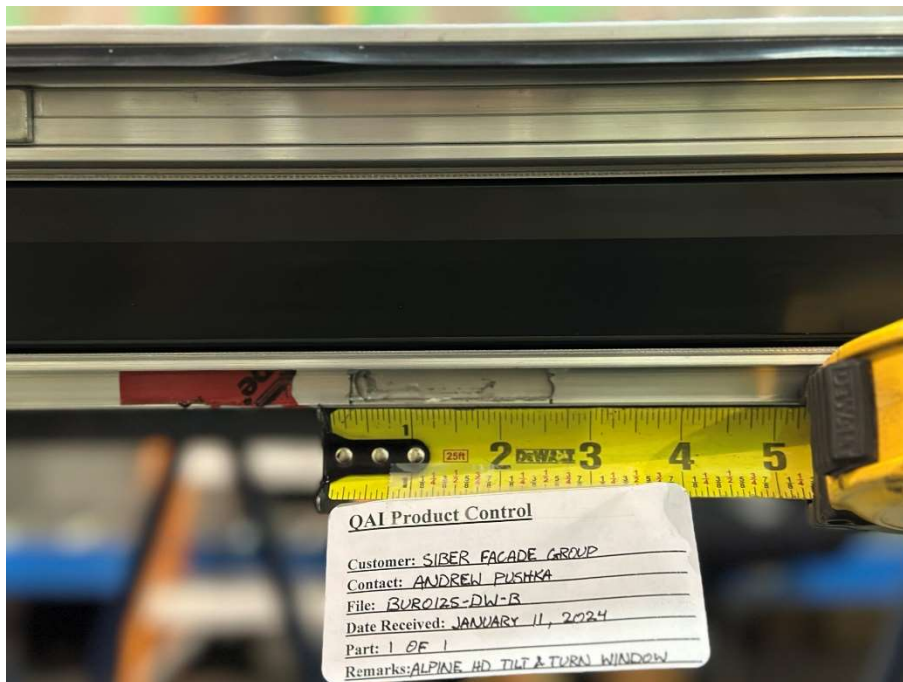


Figure 16: Drainage out of the sash.

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Figure 17: Casement/stay arm hinge - Frame side.



Figure 18: Casement/stay arm hinge - Sash side.

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Figure 19: Multi-point locking system - Top rail - Hinge side section.



Figure 20: Multi-point locking system - Top rail – Middle section.

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Figure 21: Multi-point locking system - Top rail - Locking side section.



Figure 22: Multi-point locking system - Locking stile - Upper section.

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Figure 23: Multi-point locking system - Locking stile - Middle section.



Figure 24: Multi-point locking system - Locking stile - Lower section.

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Figure 25: Multi-point locking system - Bottom rail - Locking side section.



Figure 26: Multi-point locking system - Bottom rail - Middle section.

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Figure 27: Multi-point locking system - Bottom rail - Hinge side section.



Figure 28: Multi-point locking system - Hinge stile - Lower section.

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Figure 29: Multi-point locking system - Hinge stile - Middle section.



Figure 30: Multi-point locking system - Hinge stile - Upper section.

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Figure 31: Keeper.

REPORT REVISION HISTORY

Date	Revision	Change Description	Initials
January 16, 2024	0	Original Report: Siber Facade Group. Alpine HD Aluminum Tilt and Turn Window	RM

*****<END OF REPORT>*****

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