Element Materials Technology
2475 Speers Road,
Oakville, ON
Canada, L6L 2X9

P: 1 905 822 4111
info.toronto.industrials@element.com
element.com

PERFORMANCE EVALUATION OF
CASEMENT WINDOW "3-¼" CASEMENT"
FOR A&R SHERK MFG INC.
IN ACCORDANCE WITH:
AAMA/WDMA/CSA 101/I.S.2/A440-22
AND A440S1-25

Report to:	A&R Sherk Mfg Inc. 347061 4th Concession B Maxwell, ON N0C 1J0 Canada
Attention:	Alvin Sherk
Telephone: Email:	+1 519-270-1735 arsherkmfg23@gmail.com
New Report No.: Original Report No.:	26-06-B0017-8N 24-06-B0159-14N 8 Pages, 1 Appendix
Re-Issue Proposal No.: Original Proposal No.:	26-006-789288 RV1 26-006-789288 RV1
Re-Issue Date: Date:	February 27, 2026 October 1, 2025

Product Manufacturer:	A&R Sherk Mfg Inc.
Product Type:	Casement Window
Product Series/Model:	3-1/4" Casement
Primary Product Designator:	**Class CW – PG3600 – Size tested 805 mm x 1505 mm – Casement Window** **Class CW – PG75 – Size tested 31.69 in x 59.25 in – C**
Secondary Product Designator:	
Positive Design Pressure:	3600 Pa (75.19 psf)
Negative Design Pressure:	3600 Pa (75.19 psf)
Water Penetration Resistance:	580 Pa (12.11 psf)
Air Infiltration/Exfiltration:	Pass
Test Completion Date:	September 11, 2025
Report Number:	26-06-B0017-8N

1.0 INTRODUCTION

At the request of A&R Sherk Mfg Inc., Element Materials Technology Inc. was retained to evaluate the physical performance of a Casement Window identified as "3-1/4" Casement", in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-22 Standard, "NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights" and A440S1-25 Canadian Supplement, as outlined in proposal number 26-006-789288 RV1.

Note 1: These test methods are included in the Element ISO 17025 Scope of Accreditation under A2LA Certificate. No. 6524.01

Note 2: This report is re-issued in the name of A&R Sherk Mfg Inc., through written authorization from Gracious Living Innovations, to whom the original report was released. Element Original Report No.: 24-06-B0159-14N (Dated: October 1, 2025).

Note 3: The results reported herein also meet or exceed the requirements of the AAMA/WDMA/CSA 101/I.S.2/A440-17 standard and A440S1-19.

Element Specimen No.:	25-06-B0159-14
Type:	Casement Window
Model:	3-1/4" Casement
Overall Window Size:	805 mm x 1505 mm (31.69" x 59.25")
Sampling:	NA

2.0 SAMPLE DESCRIPTION

The following sample description has been verified by Element. Details and drawings of the described test specimen, as provided by the manufacturer, have been included in Appendix A.

Product Type:	Casement window
Frame:	Casement, extruded PVC, 805 mm x 1505 mm x 83 mm (31.69" x 59.25" x 3.27")
Sash:	Open out, extruded PVC, 760 mm x 1465 mm x 60.4 mm (29.92 " x 57.32" x 2.38")
Joinery:	
Frame:	Welded, Mitred Corners
Sash:	Welded, Mitred Corners
Installation:	
Test Buck:	Wood Buck, all knots and cracks sealed with flexible sealant
Adhesive:	Frame, adhered in buck with expanding structural adhesive
Interior Blind Stops:	Wood, four, one per frame member, cut 150 mm (5.91") short at each end, fastened to buck with 18 ga 1 ½" wood staples, 63.5 mm (2.5") spacing c/c
Exterior Blind Stops:	Wood, four, one per frame member, full length, fastened to buck with 18 ga 1 ½" wood staples, 63.5 mm (2.5") spacing c/c
Sealant:	Exterior frame perimeter blind stops sealed with flexible sealant
Glazing Type:	Dual glazed, annealed, overall thickness 22 mm (0.87"), glass thickness 3 mm (0.12"), gas cavity size 16 mm (0.63"), GED intercept ultra u-channel metal spacer, dual sealed, argon filled gas cavity

Glazing Method:	Laid-in, wet glazed
Glazing Stop:	Extruded PVC, interior perimeter
Perimeter Bead:	Flexible sealant, interior, perimeter, at glazing stop
Setting Block:	Rubber, eight, 20 mm x 32.2 mm x 3.7 mm (0.79" x 1.27" x 0.15") Four, interior glazing cavity, two per stile, 180 mm (7.09") from ends Four, interior glazing cavity, two per head/sill, 110 mm (4.33") from ends
Back Bead:	Flexible sealant, exterior perimeter
Drainage/Ventilation:	
Frame:	None
Sash:	
Drain hole	Four, 4.5 mm (0.18") diameter, bottom rail, exterior edge, 60.5 mm (2.38") and 80.5 mm (3.17") from ends Two, 4.5 mm (0.18") diameter, bottom rail, glazing cavity, 115 mm (4.53") from ends
Weather-Stripping:	
Frame:	
Bulb:	Flexible PVC, one row, 7.4 mm (0.29") diameter, upstanding leg, exterior facing, full perimeter, kerf mounted Flexible PVC, one row, 7.4 mm (0.29") diameter, bottom step, exterior facing, full perimeter, kerf mounted
Sash:	
Pile with High Fin	One row, 4 mm (0.16") high pile, 5 mm (0.20") high fin, full perimeter, exterior edge, kerf mounted
Hardware:	
Operator:	Cast metal, one, 250 mm (9.84"), three arm, sill, 390 mm (15.35") from lock stile, fastened to sill with six #8 x 3/4" flat head screws, sealed at exterior face with flexible sealant, sealed at interior face foam gasket Operator track, cast metal, 370 mm (14.57"), fastened to bottom rail with three #8 x 1" flat head screws Fixed point, cast metal, bottom rail, 28 mm (1.10") from hinge stile, fastened with two #8 x 1" flat head screws and one #10 x ½" flat head screw
Lock Handle:	Cast metal, one, lock jamb, 170 mm (6.69") from sill, fastened with two #10 x 1/2" pan head screws
Tie Bar:	Cast metal, one, lock jamb centre step edge, 1295 mm (50.98") long, four metal mushroom type, lock handle engages second point from the sill
Tie Bar Guide:	Plastic, three, lock jamb, 120 mm (4.72"), 770 mm (30.31") and 1300 mm (51.18"), from the sill, each fastened with two #8 x 1" flat head screws
Keeper:	Metal, three, lock stile, paired with locking points, 60 mm (2.36"), 650 mm (25.60") and 1230 mm (48.43") from bottom rail, each fastened with two #10 x 1/2" flat head screws.
Snubbers	Metal, two pairs, hinge jamb/stile, 350 mm (13.78") from the ends, hinge jamb fastened with two #10x1/2" flat head screws, hinge stile fastened with two #8 x ½" flat head screws
Hinge:	Metal, two, 190 mm (7.48"), header/top rail and sill/bottom rail, at the hinge jamb, fastened to header/sill with four #10 x 1/2" flat head screws, fastened to top/bottom rail with four #8 x 3/4" flat head screws
Squaring Block:	Plastic, one, bottom rail, 160 mm (6.30") from the lock jamb, fastened with one #10 x 1/2" flat head screw.
Screen:	685 mm x 1390 mm x 13 mm (26.97" x 54.72" x 0.51"), roll-formed, external plastic corner keys with integrated sprung retainers, fibreglass mesh, T-spline, supported on all four sides at the interior

3.0 TEST EQUIPMENT

Table 1 – Element Test Equipment

Equipment Description:	Asset No. (MII):	Calibration Due Date:
Pressure Transducer	P00029	6-Jan-26
Pressure Transducer	P00208	13-Jan-26
String Guage Window Wall	P00039	31-Oct-25
String Guage Window Wall	P00038	31-Oct-25
String Guage Window Wall	P00034	31-Oct-25
AWS System	P00042	20-Nov-25
Spray Rack	B16727	20-May-26
Digital Caliper	B10643	16-Dec-25
Force Guage	B17457	23-May-26
Load Cell	B12007	19-Nov-25
Load Cell	P00203	16-Dec-25
Load Cell	B01312	19-Nov-25
Stopwatch	P00153	7-Mar-26

4.0 TEST RESULTS:

Table 1 – Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-22 and A440S1-25 Canadian Supplement

Test	Requirements		Results		Rating
Operating Force (Clause 8.3.1) *Per ASTM E2068* **Test Date:** September 10, 2025	**Operating Device:** The maximum force to initiate and maintain the sash shall be less than the following, N (lbf):		Operating Device, measured force, N (lbf):		**PASS**
	Force:	60 (13.49)	Force:	19.7 (4.43)	
	Latching Device: The maximum force required to open and close the latch shall be less than the following, N (lbf):		Latching Device, measured force N (lbf):		**PASS**
			Open:	33.9 (7.61)	
	Maximum Force:	100 (22.50)	Close:	33.9 (7.61)	
Air Leakage Resistance (Clause 8.3.2) *Per ASTM E283* **Test Date:** July 7, 2025	Allowable rate of air leakage shall be less than or equal to the following, L/s.m² (cfm/ft²), at the subsequent test pressure:		Test area, m² (ft²): 1.21 (13.04)		**PASS**
			Measured Air Leakage Rate, L/s.m² (cfm/ft²):		
	Test Pressure, Pa (psf):	75 (1.57)	Infiltration:	0.13 (0.03)	
	Maximum Allowable:	1.0 (0.20)	Exfiltration:	-0.12 (-0.02)	
Water Penetration Resistance (Clause 8.3.3) *Per ASTM E547* **Test Date:** July 8, 2025	No water leakage shall be observed at the following specified pressure differential, Pa (psf):		No water leakage was observed at the following specified cyclic pressure differential, Pa (psf):		**PASS** Gateway **(CW30-CA)** Optional Performance **(CW80-CA)**
	Gateway Performance:		**Gateway Performance:**		
	Test Pressure:	220 (4.59)	Test Pressure:	220 (4.59)	
	Optional Performance:		**Optional Performance:**		
	Test Pressure:	580 (12.11)	Test Pressure:	580 (12.11)	

Table 1, Continued – Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-22 and A440S1-25 Canadian Supplement

Test	Requirements		Results		Rating
Uniform Load Deflection (Clause 8.3.4.2) *Per ASTM E330* **Test Date:** July 11, 2025	The deflection of the unsupported span must not exceed L/175 at the specified test pressure, Pa (psf):		Measured net deflection of lock stile, mm (in):		**PASS** Gateway **(CW30-CA)** Optional Performance **(CW75-CA)**
	Allowable deflection, mm (in): 8.4 (0.33)		Span: 1465 (57.68)		
	Gateway Performance:		Positive:	2.85 (0.11)	
	Test Pressure:	±1440 (30.08)	Negative:	1.23 (0.05)	
	Optional Performance:		*Left Blank Intentionally*		
	Test Pressure:	±3600 (75.19)			
Uniform Load Structural (Clause 8.3.4.3) *Per ASTM E330* **Test Date:** July 11, 2025	There shall be no permanent damage to the window components after the following specified test pressures, Pa (psf). No member shall have permanent deflect more that 0.3% of span.		Measured permanent deflection of Lock Stile, mm (in):		**PASS** Gateway **(CW30-CA)** Optional Performance **(CW75-CA)**
	Allowable permanent set, mm (in): 4.4 (0.17)		Span: 1465 (57.68)		
	Gateway Performance:		Positive:	0.04 (0.002)	
	Test pressure:	±2160 (45.11)	Negative:	0.51 (0.02)	
	Optional Performance:		*Left Blank Intentionally*		
	Test pressure:	±5400 (112.78)			

Table 1, Continued – Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-22 and A440S1-25 Canadian Supplement

<table>
<tr><th>Test</th><th colspan="6">Requirements</th><th colspan="2">Results</th><th>Rating</th></tr>
<tr><td rowspan="8">Forced-Entry Resistance
(Clause 8.3.5)

Per ASTM F588

Test Date:
September 10, 2025</td><td colspan="6">No entry shall be gained during the following test sequence:</td><td colspan="2">For Type B Window no entry was gained during the following specified test sequence:</td><td rowspan="8">PASS

Grade 20</td></tr>
<tr><td rowspan="2">Load Identification</td><td colspan="5">Grade Loads, N (lbf)</td><td rowspan="2">Disassembly T1:</td><td rowspan="2">No Entry</td></tr>
<tr><td>10</td><td>20</td><td>30</td><td>40</td></tr>
<tr><td>Disassembly T1:</td><td colspan="2">5 min</td><td colspan="3">10 min</td></tr>
<tr><td>L1:</td><td>667 (150)</td><td>890 (200)</td><td>1112 (250)</td><td>1334 (300)</td><td>L2 + L2:</td><td>No Entry</td></tr>
<tr><td>L2:</td><td>333 (75)</td><td>445 (100)</td><td>556 (125)</td><td>667 (150)</td><td>L1 + L2 + L2:</td><td>No Entry</td></tr>
<tr><td>L3:</td><td>111 (25)</td><td>155 (35)</td><td>222 (50)</td><td>267 (60)</td><td>L1 + L2 + L2:</td><td>No Entry</td></tr>
<tr><td>Manipulation T1:</td><td colspan="2">5 min</td><td colspan="3">10 min</td><td>Manipulation T1:</td><td>No Entry</td></tr>
<tr><td rowspan="3">Casement Hardware Load Test
(Clause 8.3.6.4)

Test Date:
September 11, 2025</td><td colspan="6" rowspan="2">There shall be no operational malfunction and no hardware permanent deformation following the application of the following test load, Pa (psf):</td><td colspan="2">No operational malfunction and no hardware permanent deformation was observed.</td><td rowspan="3">PASS</td></tr>
<tr><td>Open Direction:</td><td>No Failure</td></tr>
<tr><td colspan="2">Test Load:</td><td colspan="4">300 (6.27)</td><td>Close Direction:</td><td>No Failure</td></tr>
<tr><td rowspan="2">Insect Screen Serviceability
(Canadian Supplement Section 5.1)
Per ASTM E1748

Test Date:
September 11, 2025</td><td colspan="6">There shall be no disengagement or deformation of screen members after the application of the following test load, N (lbf):</td><td colspan="2" rowspan="2">No disengagement or deformation of screen members was observed after the application of test load</td><td rowspan="2">PASS</td></tr>
<tr><td colspan="2">Test Load:</td><td colspan="4">60 (13.49)</td></tr>
</table>

5.0 MODIFICATIONS

No modifications were made to A&R Sherk Mfg Inc., Casement Window "*3-1/4" Casement*", Element Specimen No.: 25-06-B0159-14, during testing to achieve the results stated in this report:

6.0 CONCLUSION

Based on the results of the testing summarised in Table 1. Gracious Living Innovations Inc Casement Window "*3-1/4" Casement*" Element Specimen No.: 24-06-B0159-14 met the following requirements as outlined in the AAMA/WDMA/CSA 101/I.S.2/A440-22 and A440S1-25.

Note: This report is re-issued in the name of A&R Sherk Mfg Inc., through written authorization from Gracious Living Innovations, to whom the original report was released. Element Original Report No.: 24-06-B0159-14N (Dated: October 1, 2025).

Performance Rating

- Operating Force — Pass
- Air Leakage Resistance — Pass
- Water Penetration Resistance — 580 Pa (12.11 psf)
- Uniform Load Deflection — ±3600 Pa (75.19 psf)
- Uniform Load Structural — ±5400 Pa (112.78 psf)
- Forced Entry Resistance — Grade 20
- Casement Hardware Load — Pass
- Insect Screen Serviceability — Pass

Product Manufacturer:	A&R Sherk Mfg Inc.
Product Type:	Casement Window
Product Series/Model:	3-1/4" Casement
Primary Product Designator:	**Class CW – PG3600 – Size tested 805 mm x 1505 mm – Casement Window** **Class CW – PG75 – Size tested 31.69 in x 59.25 in – C**
Secondary Product Designator:	
Positive Design Pressure:	3600 Pa (75.19 psf)
Negative Design Pressure:	3600 Pa (75.19 psf)
Water Penetration Resistance:	580 Pa (12.11 psf)
Air Infiltration/Exfiltration:	Pass
Test Completion Date:	September 11, 2025
Report Number:	26-06-B0017-8N

7.0 REPORT REVISION SUMMARY

Revision No:	**Date:**	**Description of Revisions:**
24-06-B0159-14N	October 1, 2025	Original Document
26-06-B0017-8N	February 27, 2026	Report re-issued to **A&R Sherk Mfg Inc.**

Reported by:

Emmanuel Siapno, 289-888-4880
Senior Testing Technician, Building Systems
Building Science Division

Reviewed by:

Scott Hallam, B.Eng., 289-633-6601
Manager, Building Systems
Building Science Division

ACCREDITATION: (A2LA 6524-01, 02, 03)

APPENDIX A

Manufacturer's Detail Drawings

(5 Pages)

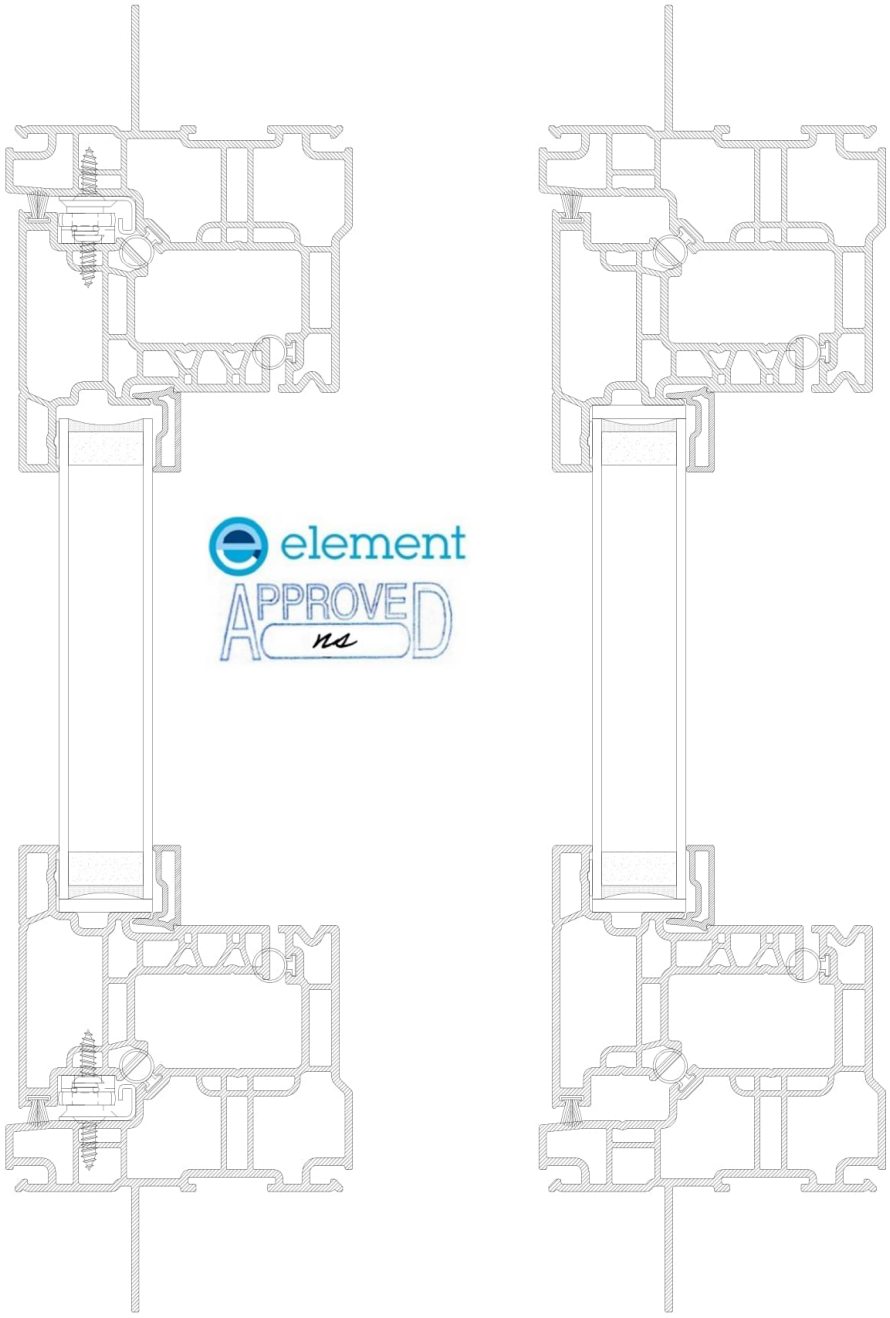
ITEM NO.	DESCRIPTION	QUANTITY	PART NO.	SOURCE
1	HEAD Rigid Vinyl (PVC)	1	2100N-2100F (FINLESS/FIN)	GLI
2	SILL Rigid Vinyl (PVC)	1	2100N-2100F (FINLESS/FIN)	GLI
3	JAMB Rigid Vinyl (PVC)	2	2100N-2100F (FINLESS/FIN)	GLI
4	TOP & BOTTOM RAIL Rigid Vinyl (PVC)	2	31001	GLI
5	STILES SASH Rigid Vinyl (PVC)	2	31001	GLI
6	GLAZING BEAD Rigid Vinyl (PVC)	4	50002	GLI
7	DUAD/DUAL OPERATOR	1	50.60.32.211 / 50.10.32.212	AMESBURRY / TRUTH
8	OPERATOR GASKET	1	31882	AMESBURRY / TRUTH
9	MULTI-PT SASH LOCK	1	24.33.32.004	AMESBURRY / TRUTH
10	SUPPORT PLATE	1	21600.92	AMESBURRY / TRUTH
11	TIE BAR	1	11900.92 / 11945.92	RADISSON
12	TIE BAR GUIDE	2 or 3 or 4	TG-375-180	RADISSON
13	SNUBER SASH	1	32939.92	AMESBURRY / TRUTH
14	SNUBER FRAME		31496.92	AMESBURRY / TRUTH
15	HINGE LEFT		14.97.00.005	AMESBURRY / TRUTH
16	HINGE RIGHT		14.97.00.006	AMESBURRY / TRUTH
17	OPERATOR TRACK		11576.92	AMESBURRY / TRUTH
18	BRACKET LEFT or RIGHT		14690.93 / 14691.93	AMESBURRY / TRUTH
19	KEEPER	2 or 3 or 4	GA-017-LH / RH	RADISSON INDUSTRIES
20	HANDLE W/COVER	1	12616.32 / 12614.32	AMESBURRY / TRUTH

element APPROVED ns

APPROVED BY:

DATE:

GRACIOUS LIVING Innovations



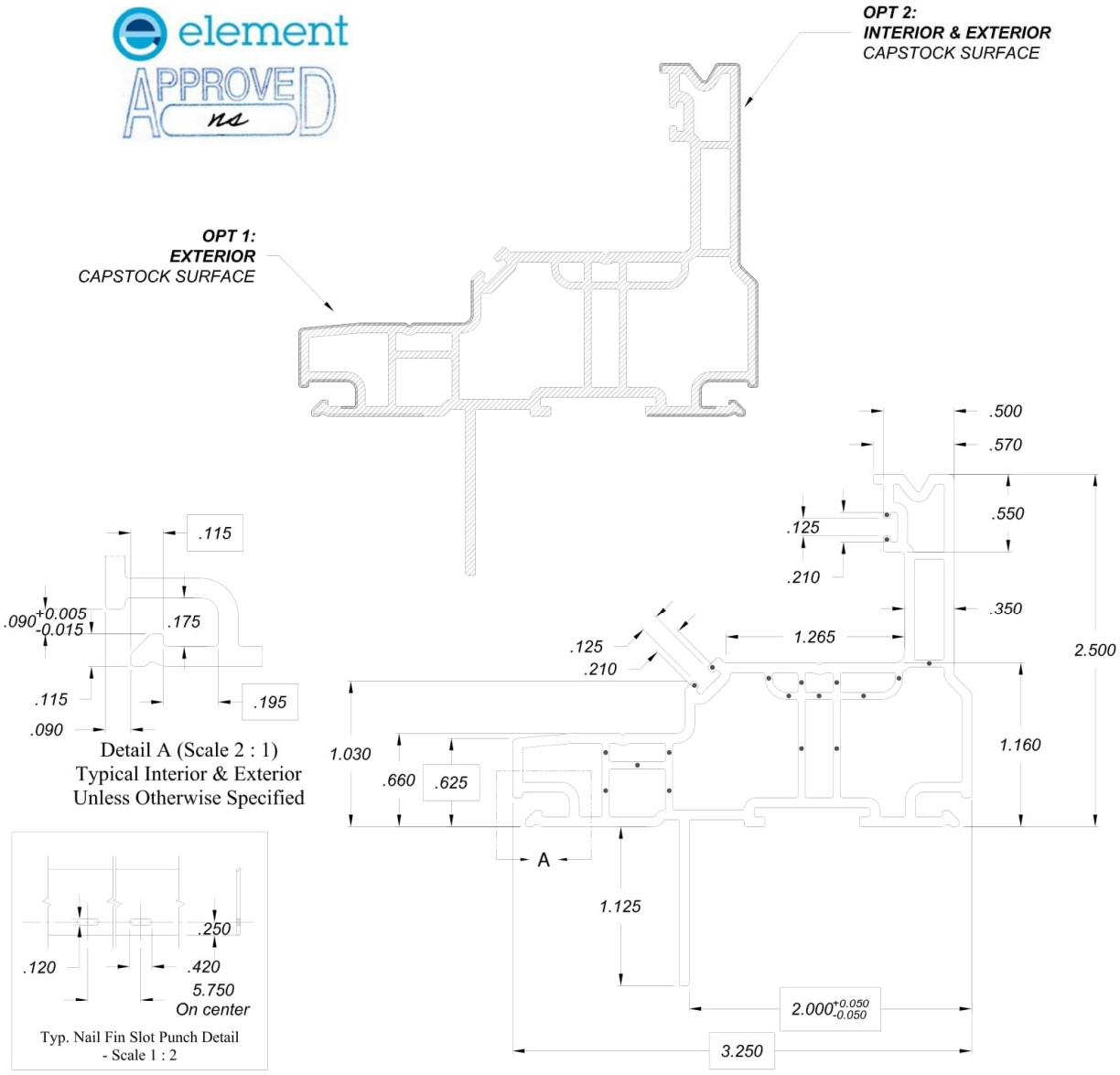
TOLERANCES: UNLESS SPECIFIED X.XX = PLUS/MINUS 0.015" X.XXX = PLUS/MINUS 0.010" X.XXXX = PLUS/MINUS 0.005"	3 1/4" Operable Casement 7/8" Dual I.G. - Assembly Cross Sections			
COLOUR: As specified	REVISION: Current		DIE NUMBER:	DWG NO.: VCDGASS-01
MATERIAL: As specified	SCALE: 1 : 1	DRAWN BY:	CUSTOMER PART NUMBER:	DATE: 07-03-2025

APPROVED BY:

DATE:

GRACIOUS LIVING Innovations

element APPROVED ns



Detail A (Scale 2 : 1)
Typical Interior & Exterior
Unless Otherwise Specified

Typ. Nail Fin Slot Punch Detail
- Scale 1 : 2

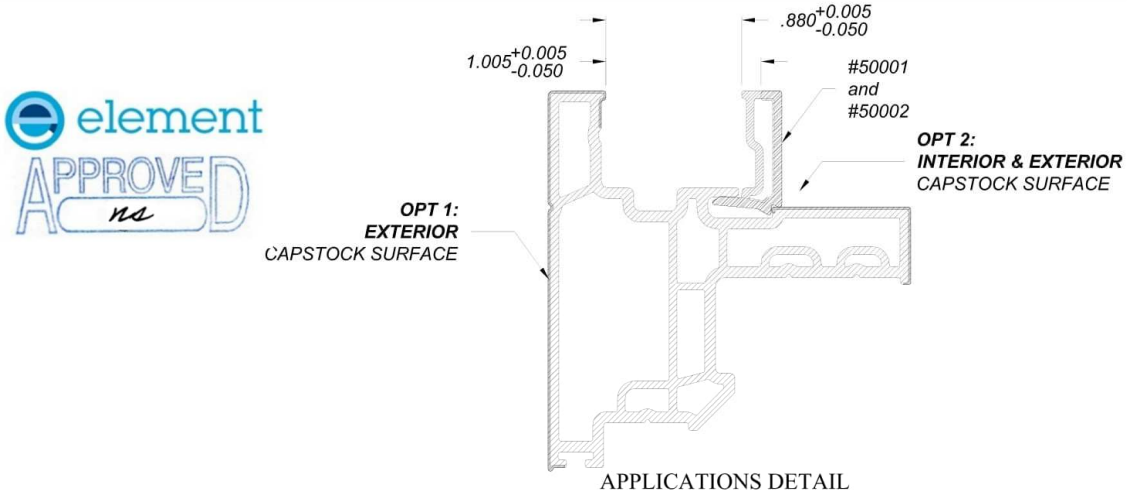
WALL THICKNESS: UNLESS SPECIFIED
NOMINAL = 0.070"
● = 0.050"

RADIUS NOTES: unmarked = 0.015" / a = 0.010" / b = 0.020" / c = 0.030"/ d = 0.060" / f = full / s = Sharp

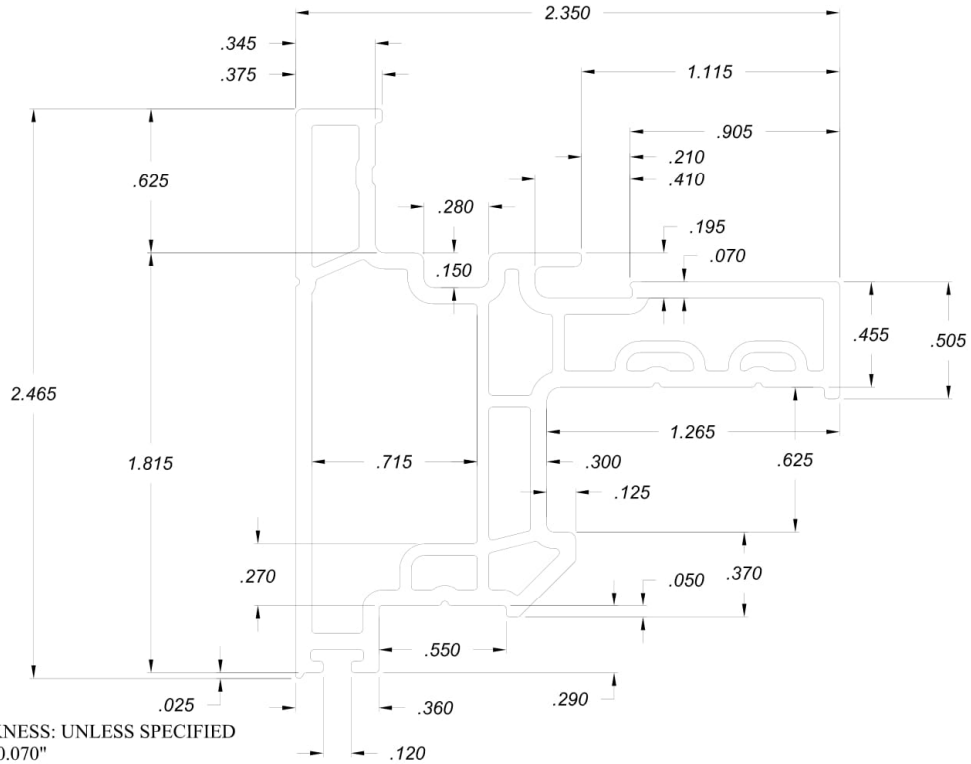
TOLERANCES: UNLESS SPECIFIED X.XX = PLUS/MINUS 0.015" X.XXX = PLUS/MINUS 0.010" X.XXXX = PLUS/MINUS 0.005"	*Operable Casement Frame w/ Nail Fin* *Part Drawing*			
COLOUR: *As specified*	REVISION: *A1 - Current*		DIE NUMBER: *21001F*	DWG NO.: *CVF21001*
MATERIAL: *Rigid P.V.C.*	SCALE: *1 : 1*	DRAWN BY:	CUSTOMER PART NUMBER:	DATE: *07-11-2024*

APPROVED BY:

DATE:



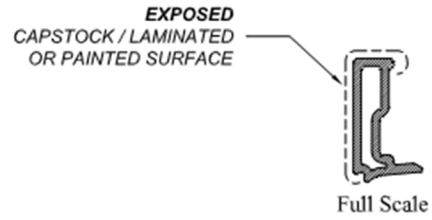
APPLICATIONS DETAIL
SCALE 1 : 1



WALL THICKNESS: UNLESS SPECIFIED
NOMINAL = 0.070"
INTERIOR = 0.050"

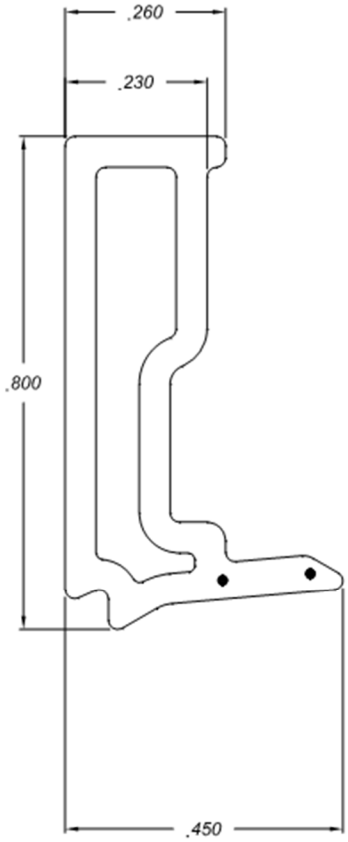
RADIUS NOTES: unmarked = 0.015" / a = 0.010" / b = 0.020" / c = 0.030"/ d = 0.060" / f = full / s = Sharp

TOLERANCES: UNLESS SPECIFIED X.XX = PLUS/MINUS 0.015" X.XXX = PLUS/MINUS 0.010" X.XXXX = PLUS/MINUS 0.005"	*Operable Casement Sash* *Part Drawing*			
COLOUR: As specified	REVISION: Current		DIE NUMBER: 31001	DWG NO.: CVS31001
MATERIAL: Rigid P.V.C.	SCALE: 3 : 2	DRAWN BY:	CUSTOMER PART NUMBER:	DATE: 11-18-2026



Full Scale

element APPROVED ns



WALL THICKNESS: UNLESS SPECIFIED
NOMINAL = 0.050"
● = 0.060"

RADIUS NOTES: unmarked = 0.015" / a = 0.010" / b = 0.020" / c = 0.030"/ d = 0.060" / f = full / s = Sharp

TOLERANCES: UNLESS SPECIFIED X.XX = PLUS/MINUS 0.015" X.XXX = PLUS/MINUS 0.010" X.XXXX = PLUS/MINUS 0.005"	7/8" (B) Glass Stop Part Drawing			
COLOUR: As specified	REVISION: A1 - Current		DIE NUMBER: 50002	DWG NO.: CG101G03
MATERIAL: As specified	SCALE: 4 : 1	DRAWN BY:	CUSTOMER PART NUMBER:	DATE: 12-05-2023