

CR LAURENCE CO., INC.

TEST REPORT

SCOPE OF WORK

AAMA/WDMA/CSA 101/I.S.2/A440-17 TESTING ON PALISADES S90 BI-FOLD DOOR
(IN-SWING)

REPORT NUMBER

M4390.01-303-47 R1

TEST DATE

05/27/21

ISSUE DATE

06/02/21

REVISION DATE

06/16/21

RECORD RETENTION END DATE

05/27/25

PAGES

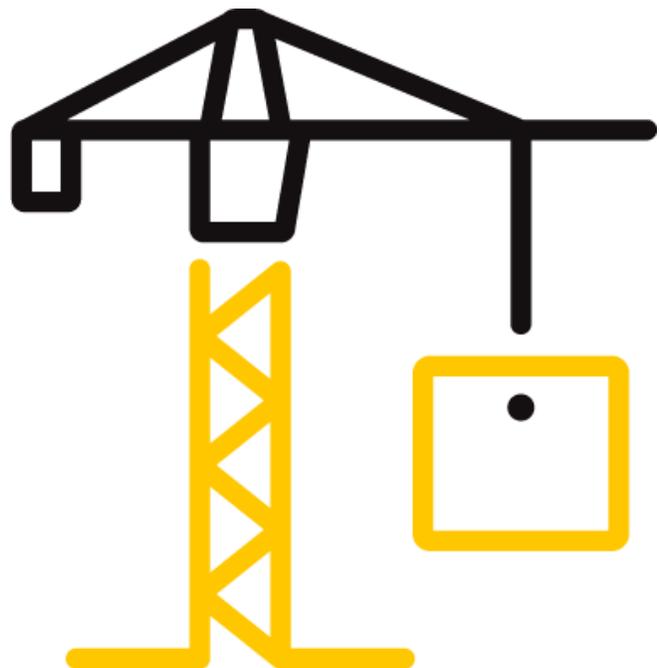
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TEST REPORT FOR CR LAURENCE CO., INC.

Report No.: M4390.01-303-47 R1

Date: 06/02/21

REPORT ISSUED TO

CR LAURENCE CO., INC.

2503 E. Vernon Avenue
Los Angeles, California 90058

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by CR Laurence Co., Inc. to perform testing in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-17, *NAFS 2017 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*, on their Palisades S90, Bi-Fold Door System. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at CR Laurence Co., Inc. test facility in Los Angeles, California. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

TITLE	RESULTS
AAMA/WDMA/CSA 101/I.S.2/A440-05	Class CW – PG40: Size Tested 2794 x 3048 mm (110 x 120 in.) – Type FLD
Design Pressure	±19520 Pa (±40.10 psf)
Air Infiltration	1.5 L/s/m ² (0.30 cfm/ft ²)
Water Penetration Resistance Test Pressure	290 Pa (6.06 psf)

For INTERTEK B&C:

COMPLETED BY:	Aaron Baker	REVIEWED BY:	Jarod Hardman
TITLE:	Supervisor	TITLE:	Operations Manager
SIGNATURE:		SIGNATURE:	
DATE:	06/16/21	DATE:	06/16/21

jsh:ab

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SECTION 3

SUMMARY OF TEST RESULTS

SECTION 4

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

AAMA/WDMA/CSA 101/I.S.2/A440-17, *NAFS 2017 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

AAMA 205-15, *In-Plant Testing Guidelines for Manufacturers and Independent Laboratories*

AAMA 1304-02, *Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems*

ASTM E283-04(2012), *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*

ASTM E330/E330M-14, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

ASTM E547-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference*

ASTM E987-88(2009), *Standard Test Methods for Deglazing Force of Fenestration Products*

ASTM F842-14, *Standard Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies, Excluding Glazing Impact*

AAMA 920-11, *Specification for Operating Cycle Performance of Side-Hinged Exterior Door Systems*

SECTION 5

MATERIAL SOURCE/INSTALLATION

Test specimen was provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of four years from the test completion date.

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/4" shim space. The exterior perimeter of the door was sealed interior and exterior with structural silicone sealant. Installation of the tested product was performed by the client.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Through frame	#10 x 3" flat head wood screw	Two fasteners per location through head, and jambs.

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Through frame #10 x 2" flat head screws Two fasteners per location through sill.

SECTION 6 EQUIPMENT

Calibration of test equipment was performed by Intertek B&C in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories"

SECTION 7 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Garrett Osterode	CR Laurence Co., Inc.
Aaron Baker	Intertek B&C

SECTION 8 TEST SPECIMEN DESCRIPTION

Product Type: Bi-Fold Door (In-Swing)

Series/Model: Palisades S90

Product Size(s):

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
8.5 m ² (91.7ft ²)				
Overall Size	2794	110	3048	120

Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Head	Aluminum	S85 Top Track, thermally broken extrusion, Part No. S85HEADDU, see attached Drawings Section 11.
Sill	Aluminum	S85 Sill Track, thermally broken extrusion, Part No. S851SS1LLDU, see attached Drawings Section 11.
Jambs	Aluminum	Lateral Frame, thermally broken extrusion, Part No. S85HJAMBDU, see attached Drawings Section 11.
	JOINERY TYPE	DETAIL
All Corners	Coped	Secured through end of frame.

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Leaf Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Stiles and rails	Aluminum	Panel, thermally broken extrusion, Part No. S85PANELDU, see attached Drawings Section 11.
Side hinged lock stile	Aluminum	S85 Jamb Extender, thermally broken extrusion, Part No. S85JAMBEXT, see attached Drawings Section 11.
Bi-fold lock stile	Aluminum	Post w/ Roller, thermally broken extrusion, press fit to panel stile, Part No. S85EVEN_ROLLER, see attached Drawings Section 11.
Bi-fold hinge stile	Aluminum	Intermediate Post Assembly, thermally broken extrusion, secured to panel stiles with hinges, Part No. S85POST, see attached Drawings Section 11.
	JOINERY TYPE	DETAIL
All Corners	Coped	Secured through frame.

Reinforcement: *No reinforcement was utilized.*

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
Flock lined single bulb gasket, Part No. MDAC350208	2 rows	Exterior leg of sill frame, see attached Drawings Section 11.
Flock lined single bulb gasket, Part No. MDAC350208	1 row	Exterior leg of head frame, see attached Drawings Section 11.
S55 Pre-Chamber Gasket, Part No. MDAC350203	1 row	Exterior leg of jamb frame, see attached Drawings Section 11.
Gasket Reinforced Post, Part No. S85GRP	1 row	Press fit onto jambs and intermediate posts, see attached Drawings Section 11.
Gasket – Low Friction Slip, Part No. S85GDR	2 rows	Kerf inserted at interior and exterior legs of stiles, see attached Drawings Section 11.
Gasket – Low Friction Slip, Part No. S85GDR	1 row	Kerf inserted at exterior leg of rails, see attached Drawings Section 11.
Gasket – Horiz Door Panel, Part No. S85GDRH	1 row	Channel inserted into interior leg of rails, see attached Drawings Section 11.
Pile, part No. 30018745BKWP	1 row	Channel inserted at head of frame, see attached Drawings Section 11.

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Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

GLASS TYPE	SPACER TYPE	INTERIOR LITE	EXTERIOR LITE	GLAZING METHOD
1" IG	Aluminum Spacer – Dual Seal (A1-D)	1/4" clear tempered	1/4" clear tempered	Exterior set dry glazed with bulb gasket (Part No. WH342001500) at interior and wedge gasket (Part No. WH416) at exterior. Glass stop at top and bottom rails (Part No. S85GLV), glass stop on stiles (Part No. S85GLHVDU).

LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Leaf	3	779 x 2886	30-11/16 x 113-5/8	5/8"

Drainage:

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weep slots	1-3/4" wide by 3/4" high	6	Through the face of the sill.

Hardware:

DESCRIPTION	QUANTITY	LOCATION
End dams, Part No. S85EDBRL / S85EDBRR	2	Located at sill on both ends of system, see attached Drawings Section 11.
Concealed hinge, Part No. S85H1NGE	25	Located at stiles of each panel pivot, see attached Drawings Section 11.
Catch Back Plate, Part No. S85CATCHBP	2	Located at bi-fold intermediate post, see attached Drawings Section 11.
Top/Bottom Bolt Guide, Part No. S85BOLTGUIDE	2	Located at bi-fold intermediate post, see attached Drawings Section 11.
SS Catch Bolt, Part No. S85CATCHBOLT	2	Located at bi-fold intermediate post, see attached Drawings Section 11.
S85 CYLINDERKIT 80 Lock Assembly, Part Nos. TH7824238 / TH7864219 / TH7974227	1	Located on lock stile of side hinged door 37-3/4" from sill, see attached Drawings Section 11.

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DESCRIPTION	QUANTITY	LOCATION
S85 CYLINDERKIT 80 Strike Assembly, Part Nos. TH70199 / TH70299 / TH70399	1	Located opposite lock stile of side hinged door 37-3/4" from sill, see attached Drawings Section 11.
Roller, Part No. S85BROLLER	1	Located on bottom of intermediate post, see attached Drawings Section 11.
Top Guide, Part No. S85TGU1DE	1	Attached to the top of panel assemblies, see attached Drawings Section 11.

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SECTION 9

TEST RESULTS

The temperature during testing was 17°C (63°F). The results are tabulated as follows:

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.7 L/s/m ² (0.14 cfm/ft ²).	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1, 2
Water Penetration, per ASTM E547 at 290 Pa (6.06 psf)	Pass	No leakage	
Uniform Load Deflection, per ASTM E330 Deflections taken at lock stile +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	14.5 mm (0.57") 13.7 mm (0.54")	16.3 mm (0.64") max. 16.3 mm (0.64") max.	3, 4, 5, 6
Uniform Load Structural, per ASTM E330 Permanent set taken at lock stile +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	1.3 mm (0.05") 0.5 mm (0.02")	8.6 mm (0.34") max. 8.6 mm (0.34") max.	4, 5, 6
Forced Entry Resistance, per ASTM F842, Type: B - Grade: 10	Pass	No entry	
Forced Entry Resistance, per AAMA 1304	Pass	No entry	
Deglazing, per ASTM E987 Operating direction, 320 N (70 lbf) Remaining direction, 230 N (50 lbf)	Pass Pass	Meets as stated Meets as stated	
Operation/Cycling Performance, per AAMA 920 # 250,000 cycles	Pass	Meets as stated	7

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Note 1: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

Note 2: Test Date 04/15/21 / Time: 08:00 AM

Note 3: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation. The deflection data is recorded in this report for special code compliance and information only.

Note 5: Loads were held for 10 seconds.

Note 6: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Note 7: At the conclusion of the test, there were no signs of damage to the door panel, frame, construction, fasteners, glazing, weatherstripping, or system assembly.

SECTION 10 **ALTERATIONS**

No alterations were required.



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Lake Forest, California 92630

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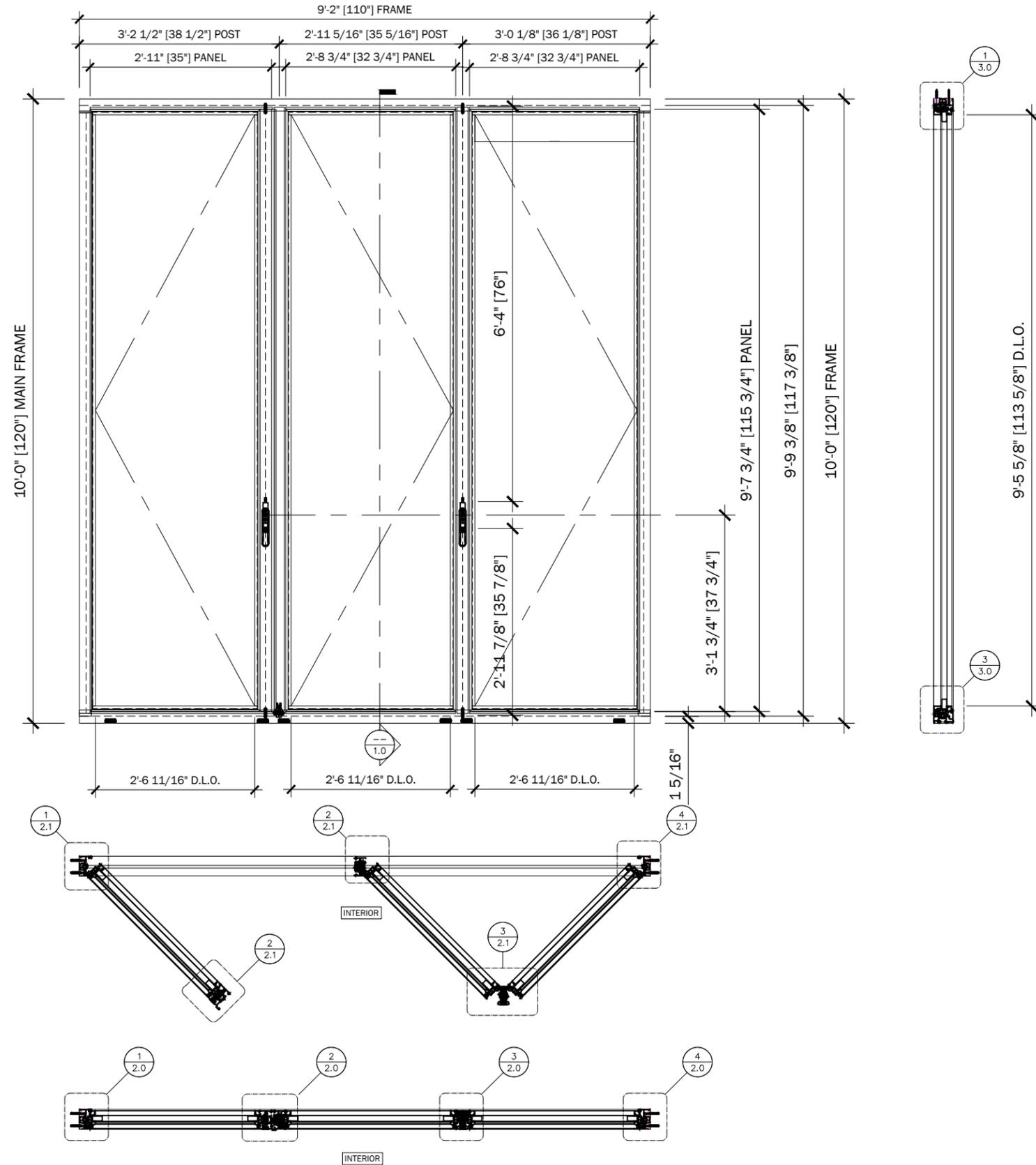
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Date: 06/02/21

SECTION 11

DRAWING(S)

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



① IN - SWING BI-FOLD DOOR
ARCH REF: NONE

1"=1'-0"

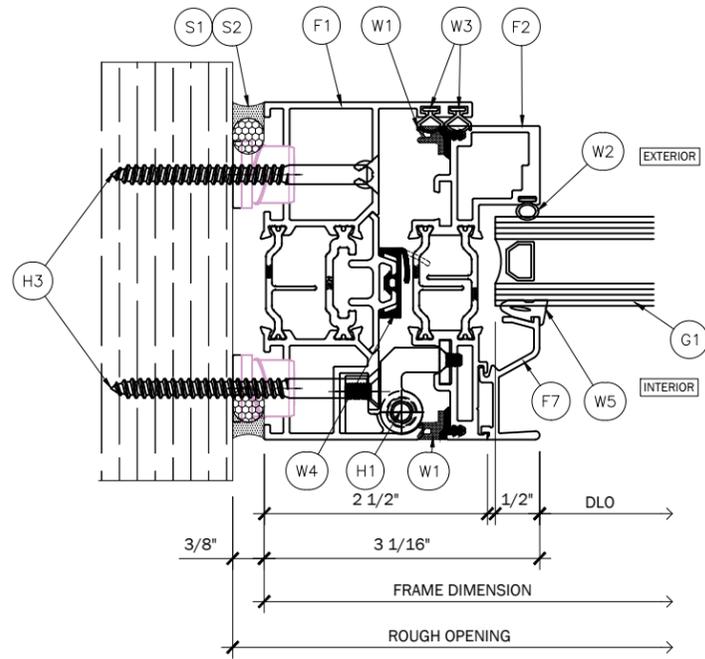
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PALISADES S90 BI-FOLD SOOR SYSTEM - IN-SWING

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Checked By :	MS
Date :	5.3.2021
Scale :	AS AHOWN
Job # :	
ESO # :	

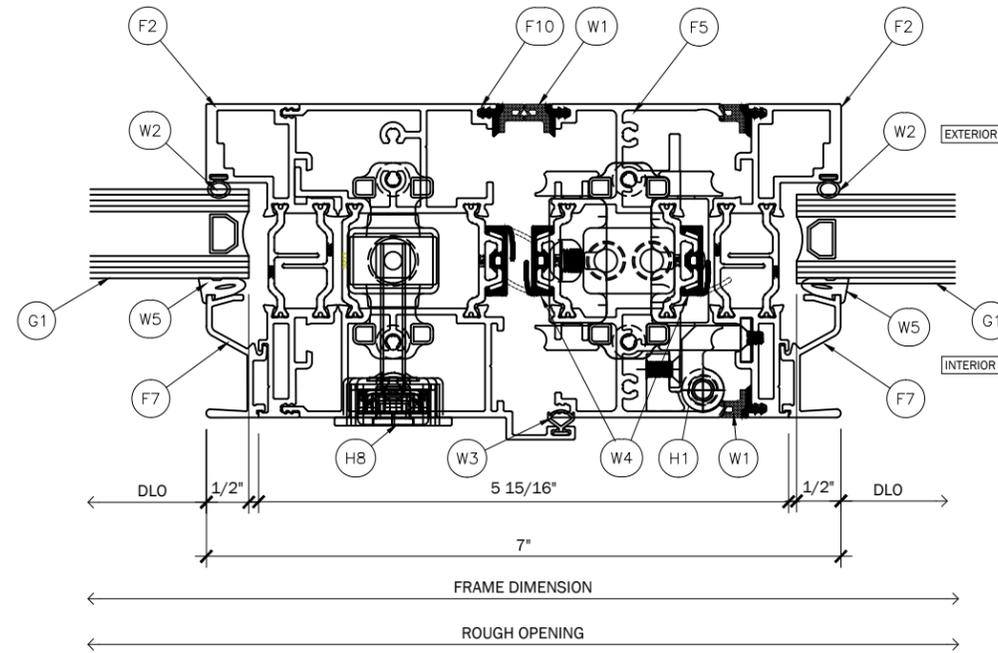
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① JAMB @ SGL. PANEL DETAIL (CLOSED)

ARCH REF: NONE

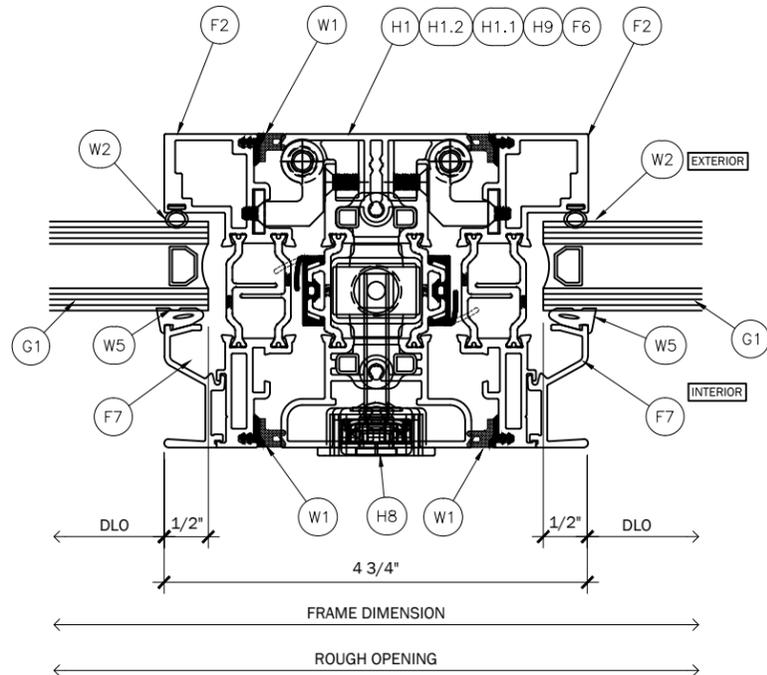
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② SGL. PANEL @ POST W/ROLLER DETAIL (CLOSED)

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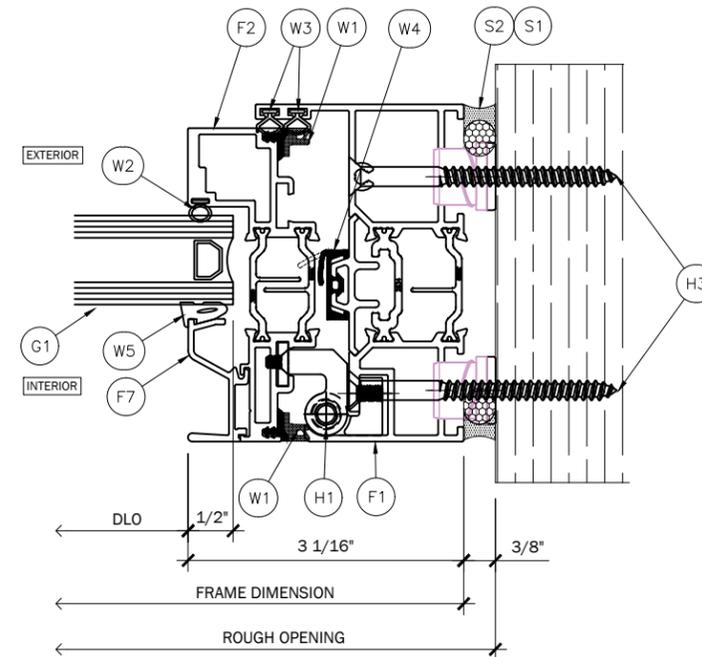
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③ MID PANEL POST DETAIL

ARCH REF: NONE

1'-0"=1'-0"



④ JAMB @ STACK SIDE DETAIL

ARCH REF: NONE

1'-0"=1'-0"

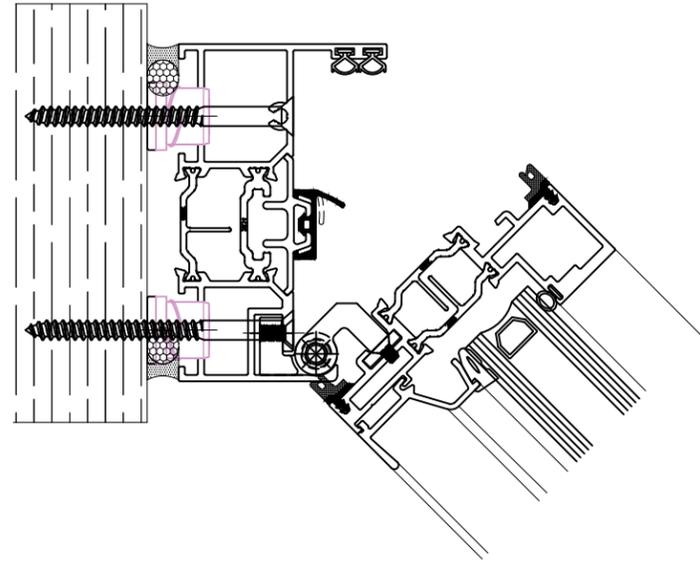
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ALUMINUM
A CRH COMPANY
2503 E. Victoria Ave., Covington, CA 95926-1877
PH: (925) 421-1144 FAX: (925) 937-7251 www.galaluminum.com

PALISADES S90 BI-FOLD SOOR SYSTEM - INSWING

Drawn By : GDO
Checked By : MS
Date : 5.3.2021
Scale : AS AHOWN
Job # :
ESO # :

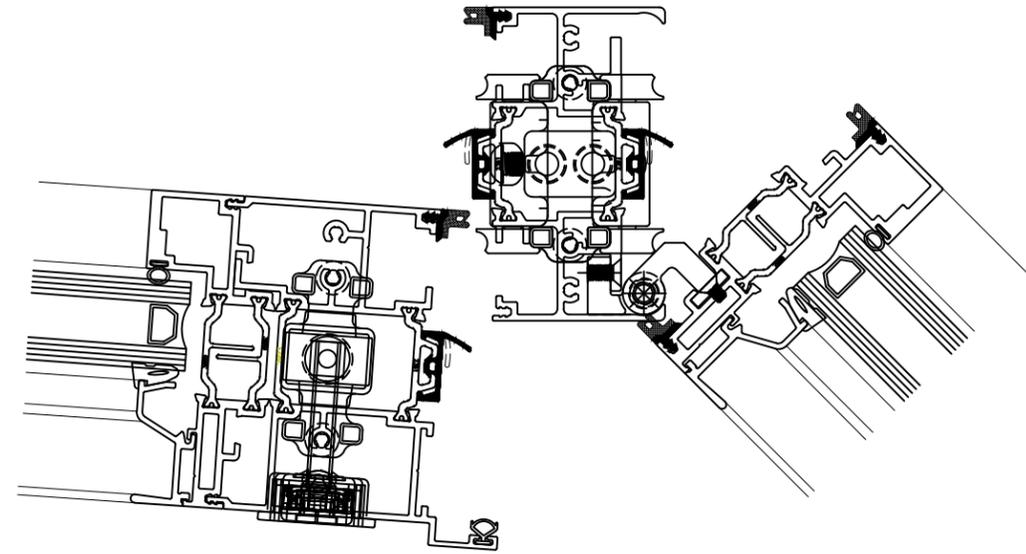
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① JAMB @ SGL. PANEL DETAIL (OPEN)

ARCH REF: NONE

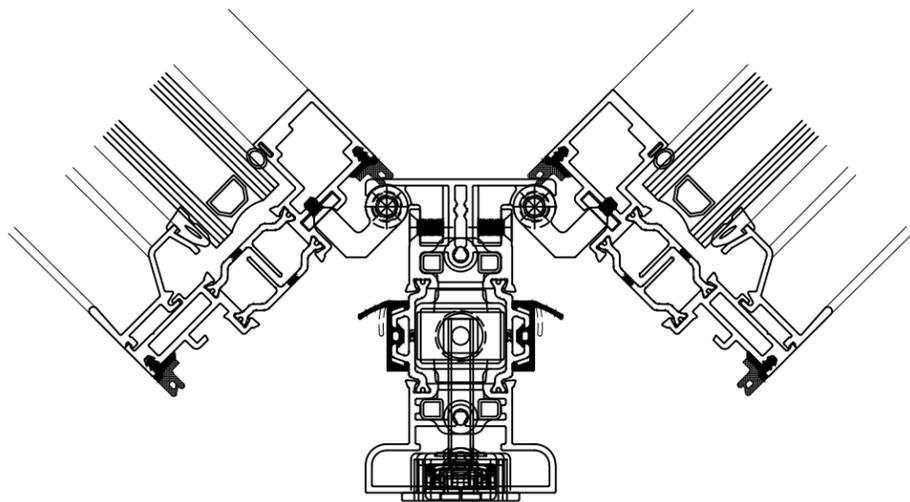
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② SGL. PANEL @ POST W/ROLLER DETAIL (OPEN)

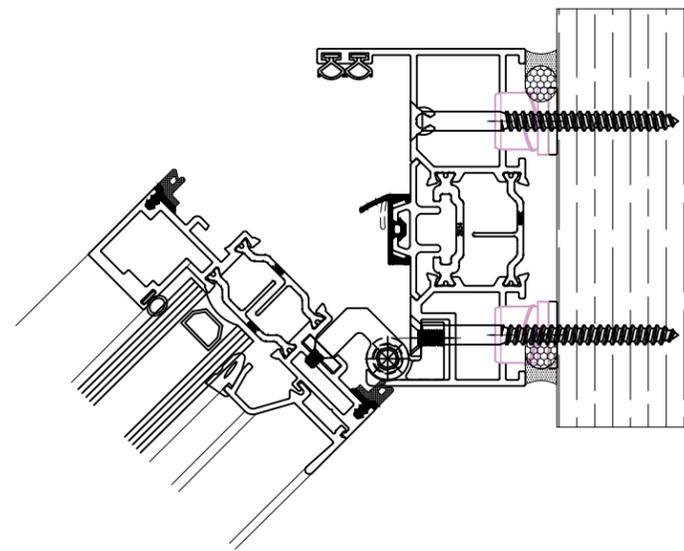
ARCH REF: NONE

1'-0"=1'-0"



③ MID PANEL POST DETAIL (OPEN)

1'-0"=1'-0"



④ JAMB @ STACK SIDE DETAIL (OPEN)

1'-0"=1'-0"

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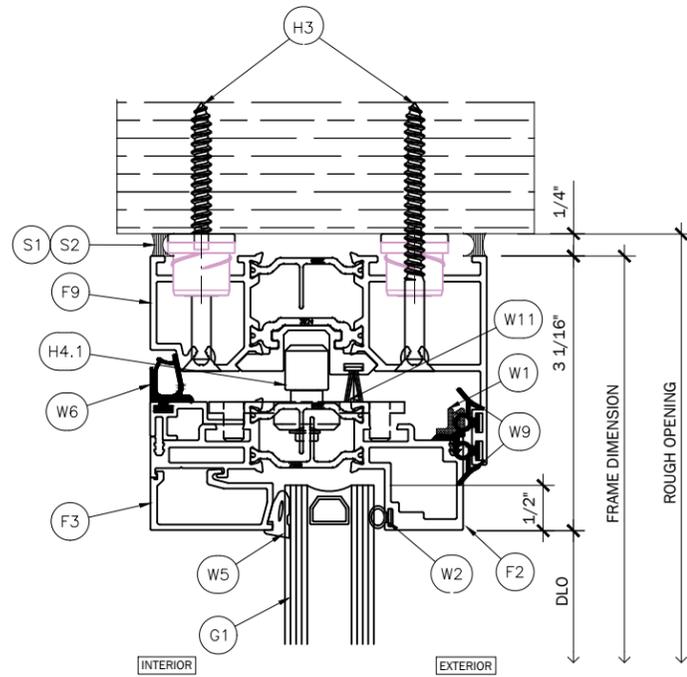
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PALISADES 990 BIFOLD SOOR SYSTEM - INSWING

Drawn By : GDO
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Sheet No.

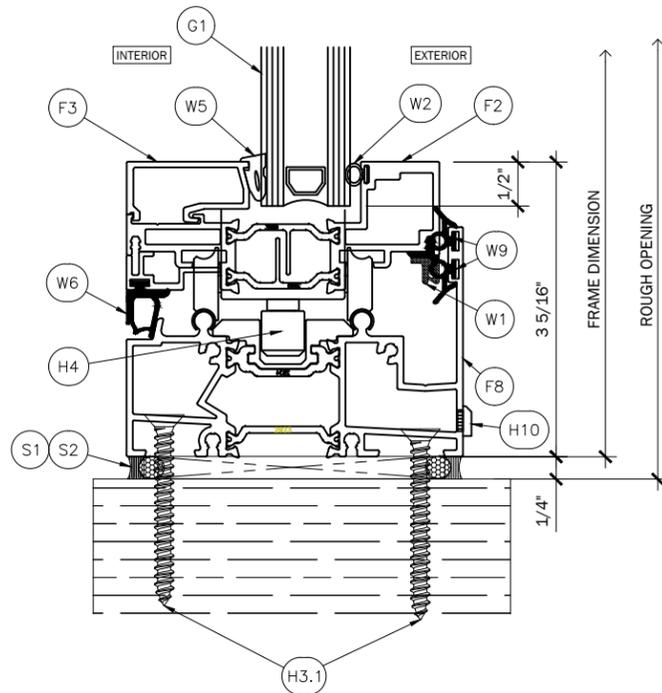
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1 HEAD DETAIL

ARCH REF: NONE

1'-0"=1'-0"



3 SILL DETAIL

ITEM		PART NO.	DESCRIPTION
F1	EXTRUSIONS	S85HJAMBDU	LATERAL FRAME; DARK BRONZE ANODIZE
F2		S85PANELDU	PANEL (INSWING & OUTSWING)
F3		S85GLHVDU	S85 GLAZING STOP W/PULL HANDLE
F4		S85PANELDU	PANEL EXTRUSION (IN/OUTSWING)
F5		S85EVEN_ROLLER	POST w/roller
F6		S85POST	INTERMEDIATE POST ASSEMBLY
F7		S85GLV	S85 GLAZING STOP
F8		S851SS1LLDU	S85 SILL TRACK
F9		S85HEADDU	S85 TOP TRACK
F10		S85JAMBEXT	S85 JAMB EXTENDER
G1		1" I.G.	.1875" x .625" x .1875" - ALUM SPACER W/AIR.
H1	HARDWARE	S85H1NGE	CONCEALED HINGE
H1.1		S85CATCHBP	CATCH; BACK PLATE
H1.2		S85BOLTGUIDE	TOB/BOTTOM BOLT GUIDE
H2		S85EDBRL/S85EDBRR	END DAMS
H3		#10X3FHWS	FLAT HEAD WOOD SCREW
H3.1		#10X2FH	FLAT HEAD WOOD SCREW
H4		S85BROLLER	ROLLER
H4.1		S85TGU1DE	S85 TOP GUIDE
H8		S85LATCH	S85 CATCH HANDLE
H9		S85CATCHBOLT	SS CATCH BOLT
H10	MDWHCB	WEEP COVER	
S1		DC795BL	DOW CORNING 795
S2		38ROD	BACKER ROD
W1	WEATHER/SEALANTS	S85GDR	GASKET - LOW FRICTION SLIP
W2		WH342001500	BULB GASKT
W3		MDAC350203	FLOCK-LINED DOUBLE BULB GASKET
W4		S85GRP	GASKET-REINFORCEMENT POST
W5		WH416	WEDGE GASKET
W6		S85GDRH	GASKET-HORIZ. DOOR RAIL
W7		MDAC350203	S55/S55R-S80/S80R PRE-CHAMBER GSKT
W8		S85GDRS	S85 DOOR RAIL GASKET
W9		MDAC350208	FLOCK LINED SINGLE BULB GASKET
W10		S85GDRS	S85 GASKET (PEROX. EPDM SPONGE W/ MCLUBE SLIP COAT 70+/-5)
W11		30018745BKWP	0.300" X 0.187", MEDIUM DENSITY, NON FIN, PILE, BLACK BACKING

2 BILL OF MATERIALS

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PALISADES S90 BI-FOLD SOOR SYSTEM - INSWING

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SECTION 12

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	06/02/21	N/A	Original Report Issue
1	06/16/21	3,8,9	Test Methods, Results, Notes