

# Fenestration Testing Laboratory, Inc.

10235 8<sup>th</sup> Street, Rancho Cucamonga, CA 91730

Report T20-096

## REPORT SUMMARY

**REPORT #**

T20-096

**TESTED FOR**

Fleetwood Windows & Doors  
1 Fleetwood Way  
Corona, CA 92879

**SERIES & PRODUCT TYPE**

4400-T - Thermally Broken Aluminum Pivot Door

**CONFIGURATION**

X

**FRAME SIZE**

3678.17 mm x 3049.52 mm (144.81" x 120.06")

**SPECIFICATION**

NAFS - North American Fenestration Standard/specification for windows, doors, and skylights  
AAMA/WDMA/CSA 101/I.S.2/A440-17

**PRIMARY DESIGNATOR**

SP - PG20 3678.17 x 3049.52 mm (144.81 x 120.06 in)

**TEST COMPLETION DATE**

September 3, 2020

**REPORT DATE**

September 30, 2020

# Fenestration Testing Laboratory, Inc.

10235 8<sup>th</sup> Street, Rancho Cucamonga, CA 91730

Report T20-096

**1.0 Tested For:** Fleetwood Windows & Doors  
1 Fleetwood Way  
Corona, CA 92879

**2.0 Purpose:**

The purpose of this report is to present the testing methods employed and the test results obtained during the performance testing of one (1) Thermally Broken Aluminum Pivot Door described in paragraph 5.0 of this report.

**3.0 Test References:**

**3.1** NAFS - North American Fenestration Standard/specification for windows, doors, and skylights  
AAMA/WDMA/CSA 101/1.S.2/A440-17

**4.0 Compliance Statement:** The test results in paragraph 6.0 indicate that the test sample described in paragraph 5.0 of this report met the performance requirements of the above specifications for the performance grade shown in 4.1 below.

**4.1** SP - PG20 3678.17 x 3049.52 mm (144.81 x 120.06 in)

**5.0 Sample Submitted:**

**5.1 Product Type:** THERMALLY BROKEN ALUMINUM PIVOT DOOR

**5.2 Series:** 4400-T

**5.3 Configuration:** X

<b>5.4 Product Dimensions:</b>	<b>Millimeters</b>	<b>Inches</b>
Total Frame:	3678.17 x 3049.52	144.81 x 120.06
Active Panel:	3621.02 x 2982.72	142.56 x 117.43

**5.5 Glass and Glazing:**

<i>IGU Thickness</i>	<i>Spacer Size</i>	<i>Interior Lite</i>	<i>Exterior Lite</i>	<i>Glazing method</i>
1.5" overall wide	0.75"	3/8" Tempered	3/8" Tempered	Outside glazed onto hollow bulb vinyl. A heel bead of silicone was applied full perimeter of the IGU. Aluminum snap-in glazing stop was applied full perimeter on the outside. The stops each contained a strip of hollow bulb vinyl.

**5.6 Weepage:**

The door weep system consisted of an aluminum pan or tank with a vertical leg on all sides. This pan was embedded in the floor substrate. The "subsill" sat in the pan with only the inside vertical leg visible on the surface. The subsill vertical leg and pan inside leg ran parallel and forming the interior linear drain. Water getting inboard of the panel would drain into the linear drain and into the pan. The pan contained threaded pipe connectors in two configurations. The door passed the air infiltration and exfiltration, and water penetration with both configurations.

Configuration #1 - five (5) ½" pipe coming out the front face of the pan. The spacing is shown on page 1 of 4 on the attached drawings.

Configuration #2 - five (5) 1" pipe weeping vertically through the bottom of the pan at the same spacing as configuration #1. Note the cross section detail on page 2 of 4 of the attached drawings.

Note that air infiltration passed with all five weeps open. For water testing, the 2<sup>nd</sup> weep from the left was closed.

**5.7 Pressure balancing:** None

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## 5.8 Weather-stripping:

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Tremco Large Bulb Vinyl (Item #13 on the BOM)	Two (2) strips	Panel stop on the left jamb facing out and panel stop on the right jamb facing in. Each stop contained one strip.
0.500" overall high polypile with center fin	Four (4) strips	Head – two strips facing down. Panel top rail – two strips facing up.
0.290" overall high polypile with center fin.	Four (4) strips	Panel left stile – two strips facing the left jamb. Panel right stile – two strips facing the right jamb.
"Drop-Down Seal, Planet" see BOM item #17	One (1)	Panel bottom rail

## 5.9 Sealants:

- Head to jamb frame corners were sealed full profile.
- Panel corners were sealed.
- Panel stop on each jamb was sealed to its respective jamb.
- Bottom of each jamb to finished floor was sealed.
- The jambs and head were sealed to the rough opening on the outside perimeter

## 5.10 Hardware:

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Pivot hardware was Frits Jurgens In-Rail Closer	One (1)	Bottom rail to sill and top rail to head. The pivot point was 62.8" from the right side of the panel.
5 point "Sentry" 5 point lock and handle	One (1)	Left side lock stile on panel – the lock handle actuated the locking points and was located 40" from the bottom of the panel. The lock included a top and bottom shoot bolt, dead bolt and remote tongues. When locked, each lock engaged its respective strike in the jamb and for the shoot bolts, in the head and sill.
Dual point lock with shoot bolts	One (1)	Right side lock stile on the panel – the lock handle 36" from the bottom of the panel and actuated the shoot bolts. The shoot bolt engaged its respective stike in the head or sill.
Single Archetype lock (Mortise lock)	One (1)	Right side lock stile on the panel – the lock flush handle was located 56" up from the bottom of the panel. When locked, the lock hook engaged a keeper in the jamb.

## 5.11 Construction:

<i>Location</i>	<i>Joinery Type</i>	<i>Number of Fasteners</i>	<i>Fastener Size</i>
Frame head to jamb	Mechanically joined with screws	Two (2) per corner	#10 x 1" PPH screws
The panel stiles were joined to the rails by fastening a shear block aluminum extrusion that fit into the rail extrusion hollow to the rail with #8 x 1" PFH screws. The shear block at each end of the bottom rail was fastened with eight screws. The shear block at each end of the top rail was fastened with four screws. At all four panel corners, a 3/8" bolt through the shear block and into the stile hollow was secured using a metal block and nut and a lock washer.			
An aluminum extrusion snap-fit to each jamb to serve as a panel stop in each jamb.			

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## 5.12 Reinforcement: None

## 5.13 Installation:

<i>Location on frame</i>	<i>Anchor type</i>	<i>Spacing</i>
The jambs and the head were anchored to the 2" x 10" wooden rough opening	#10 x 2" PPH screws at jambs #10 x 3" PPH screws at head	6" from each end and 12" on center
The pan and subsill were embedded in the substrate and supported by the substrate.		

**6.0 - Test procedures and results:** All testing procedures were performed in accordance with the performance requirements of the test specifications referenced in paragraph 3.0 of this report. The number preceding each test listed below refers to the corresponding sections in the NAFS.

### 9.3.2 - Air Infiltration (ASTM E283-04(2012)) (With both weep configurations)

Test Description	Results	Allowed	Comments
75 Pa differential pressure	1.00 L/s*m <sup>2</sup>	1.5 L/s*m <sup>2</sup>	
1.57 psf differential pressure	0.20 cfm/ft <sup>2</sup>	0.30 cfm/ft <sup>2</sup>	
The tested specimen meets/exceeds the performance levels specified in AAMA/WDMA/CSA 101/IS.2/A440 for air leakage resistance.			

### 9.3.2 - Air Exfiltration (ASTM E283-04(2012)) (With both weep configurations)

Test Description	Results	Allowed	Comments
75 Pa differential pressure	1.0015 L/s*m <sup>2</sup>	1.5 L/s*m <sup>2</sup>	
1.57 psf differential pressure	0.23 cfm/ft <sup>2</sup>	0.30 cfm/ft <sup>2</sup>	
The tested specimen meets/exceeds the performance levels specified in AAMA/WDMA/CSA 101/IS.2/A440 for air leakage resistance.			

### 9.3.3 - Water Penetration (ASTM E547-00(2016)) (With both weep configurations)

Test Description	Results	Allowed	Comments
DP20 - 150 Pa (3.13 psf)	No water penetration	No water penetration	1

### 9.3.4.2 - Uniform Load Deflection at Design Pressure (ASTM E330-14)

Test Description	Results	Allowed	Comments
DP20 - 960 Pa (20.05 psf)Pos	4.57 mm (0.18")	Report only	2
DP20 - 960 Pa (20.05 psf)Neg	2.54 mm (0.10")	Report only	2

### 9.3.4.3 - Uniform Load Structural at 1.5 x Design Pressure (ASTM E330-14)

Test Description	Results	Allowed	Comments
OL for DP20 - 1440 Pa (30.08 psf)Pos	0.51 mm (0.02")	7.62 mm (0.30")	2
OL for DP20 - 1440 Pa (30.08 psf)Neg	0.00 mm (0.00")	7.62 mm (0.30")	2

Comment #1 - No insect screen provided

Comment #2 - Deflection measurement taken from top rail on left side to the pivot point or 75" in length.

Testing was witnessed by: Jim Cruz with FTL and Corey Jones with Fleetwood Windows & Doors.

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For a complete description of the tested sample, refer to the attached four (4) pages consisting of a bill of materials, cross section drawings, and individual part drawings. This report is complete only when all the above referenced bill of materials and drawings are attached.

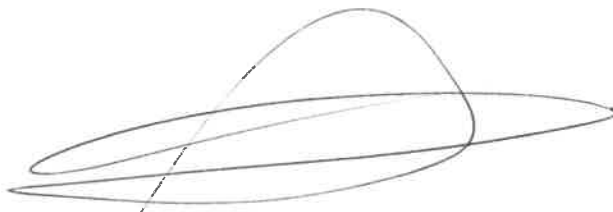
The bill of materials, cross section drawings, and individual part drawings of frame and sash members are on file and have been compared to the sample submitted. Test sample sections, bill of materials, drawings and a copy of this report will be retained at the test laboratory for four years.

This test report may not be modified in any way without the written consent of Fenestration Testing Laboratory, Inc. (FTL).

The preceding test results relate only to the tested specimen and were obtained by using the applicable test methods listed in section 3.0 and 6.0 above. This report does not constitute certification of this product or an endorsement by this laboratory. It is the property of the client named in section 1.0 above. Certification can only be granted by an approved administrator and/or validator.

**TEST COMPLETION DATE:** September 3, 2020

**REPORT DATE:** September 30, 2020



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Pete Cruz - Test Engineer



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Jim Cruz - Laboratory Manager

**TABLE OF CONTENTS**

- SHEET NO.**  
 1. GENERAL NOTES, DESIGN LOADS, FRAME ANCHOR TABLE AND SPECIMEN D1 ELEVATION  
 2. DETAILS  
 3. DETAILS  
 4. BILL OF MATERIALS

**TEST SPECIMEN**

1. SERIES / MODEL: 4400-T  
 2. PRODUCT TYPE: PIVOT DOOR WITH ARCHE-DUCT (SUB-SILL)

**GENERAL NOTES**

1. BUCKING OPENINGS & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER LOADS TO THE STRUCTURE AND TO BE REVIEWED BY BUILDING OFFICIAL.  
 2. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & MAY NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS.  
 3. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL MEET THE REQUIREMENTS OF AAMA AND BUILDING CODE.

**SPECIFICATIONS**

1. AAMA/WDMA/CSA 101/1S.2/A440-11; A440 S1-09 (CANADIAN SUPPLEMENT) - (NON-IMPACT GLAZING)

**CORNERS CONSTRUCTION**

1. **FRAME CORNER:** THE JAMBS ARE BUTTED TO THE HEAD AND ATTACHED WITH SCREWS.  
 2. **PANEL CORNER:** THE HORIZONTAL RAILS ARE BUTTED TO THE VERTICALS AND ATTACHED WITH BOLTS AND WELDED.

**ANCHORING**

HEAD: 3x2" FROM ENDS, 12" O.C.  
 JAMBS: 3x2" FROM ENDS 12" O.C.

**GLAZING**

LITE 1: 1.5" CLEAR 3/8"-T, 0.75 AIR, CLEAR 3/8"-T

ALL GLAZING SEALANT DOW CORNING 1199  
 3/4" X 3/4" WET GLAZE BEAD ON GLASS MOUNTING FLANGE, BED CAP AT EXTERIOR.

**ARCHE-DUCT DRAIN CONNECTION**

1/2" OR 1" PVC PIPES CONNECT TO 1" PVC PIPE.

**\*FRAME ANCHOR REQUIREMENTS TABLE**

OPENING TYPE (SUBSTRATE)	FRAME TO OPENING FASTENER TYPE	MINIMUM EMBEDMENT	MINIMUM EDGE DIST.
2X_ WOOD FRAME OR BUCK	(1) NO. 10 SMS SCREW	1 1/2"	3/4"
MIN. 18 GA. 33 KSI STEEL STUD	(1) NO. 8 SMS SCREW	FULL	3/8"
CMU/CONCRETE	(2) 3/16" CONCRETE SCREWS	1 1/4"	2 5/8"

(1) SMS SCREWS  
 (2) CONCRETE SCREWS SHALL BE 3/16" ITW TAPCON

**AIR INFILTRATION TABLE**

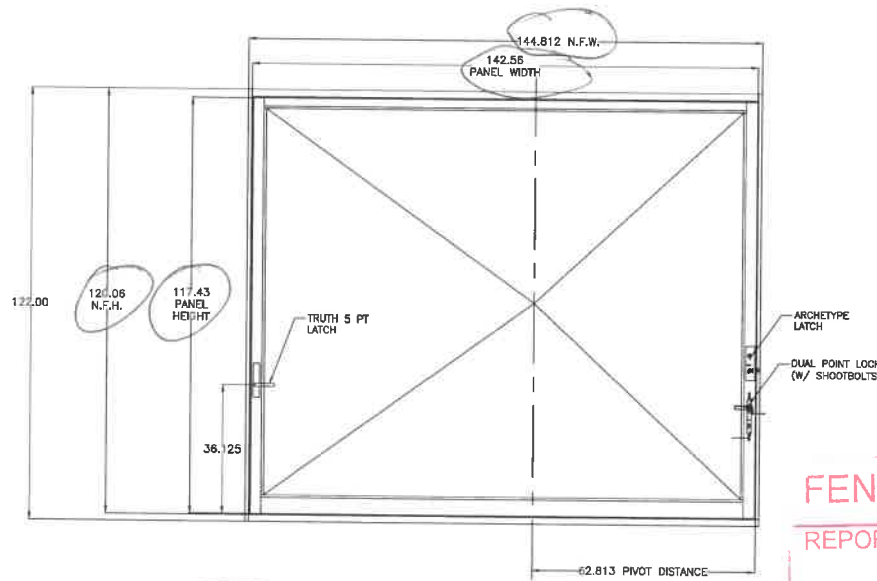
RATE	TYPE	READING
LOW	INFILTRATION	
	EXFILTRATION	
HIGH	INFILTRATION	
	EXFILTRATION	

**WATER PRESSURE TABLE**

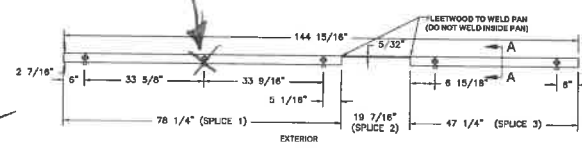
LOCATION	PRESSURE (PSF)
SIDE DRAINS	3
BOTTOM DRAINS	3

**DESIGN PRESSURE TABLE**

MAX 2 LITE N.F.W.	MAX N.F.H.	DESIGN PRESSURE (PSF)	
		POSITIVE	NEGATIVE
144"	120"	20	20



*This weep was not used for water test, but open for air infiltration test*



**FENESTRATION TESTING LAB**

REPORT NO: T20-096  
 DATE: 11/25/20

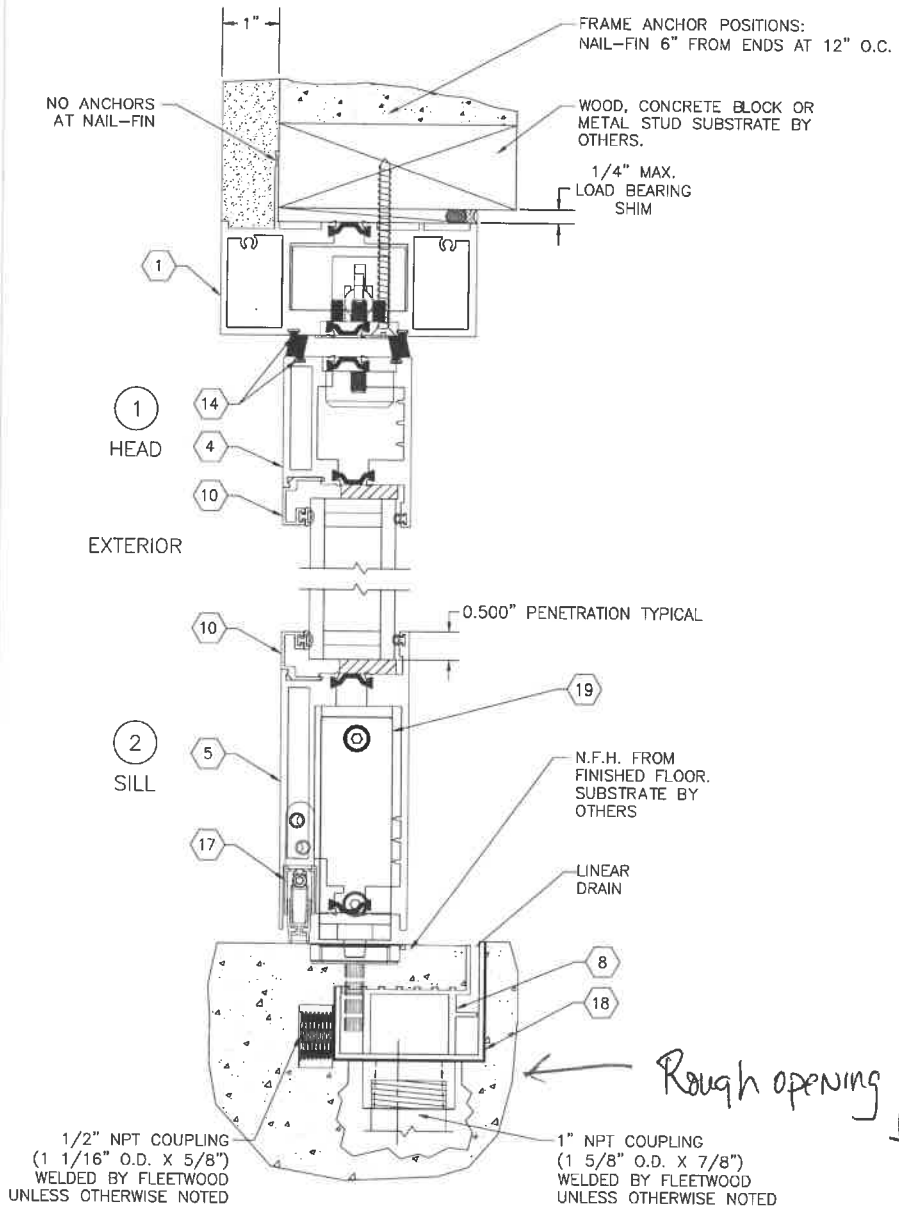
**COMMENTS**

**DRAWN BY:** CJ  
**DATE:** 12/1/20  
**REVISIONS:**  
**JOB NUMBER:** 9863  
**MATERIAL:** Thermally Broken Aluminum  
**CUSTOMER:** FLEETWOOD WINDOWS AND DOORS  
**JOB NAME:** 4400-T Curt Testing

**1 FLEETWOOD WAY  
 CORONA, CA 92679  
 www.fleetwoodusa.com**

**FLEETWOOD  
 WINDOWS & DOORS**

**SCALE:** 3/4" = 1"  
**DRAWING NO.:** 1  
**SHEET:** 1 OF 4



ITEM NO.	FLEETWOOD PART NO.	PART DESCRIPTION	VENDOR NAME	VENDOR PART NO.
ALUMINUM EXTRUSIONS				
1	4401	HEAD ASSEMBLY	MERIT	14431/14431
2	4402	JAMB	MERIT	14432/14432
3	4403	PANEL STOP	MERIT	14433
4	4404	TOP RAIL	MERIT	14434/14435
5	4405	BOTTOM RAIL	MERIT	14436/14437
6	4407	MULTIPOINT LOCK STILE ASSEMBLY	MERIT	14440/14441
7	4408	ARCHETYPE LOCK STILE ASSEMBLY	MERIT	14440/14441
8	4409	SUB SILL	MERIT	14442
GLASS STOPS				
9	3907	1" GLASS STOP	MERIT	10887
10	3908	1.5" GLASS STOP	MERIT	10886A
11	4713	1.25" GLASS STOP	MERIT	13196
MISCELLANEOUS				
12	19117	LARGE FIN SEAL MOHAIR	AMESBURY	29027045BKGB
13	25031	LARGE BULB VINYL (EPDM)	TREMCO	TX19638E
14	27031	LARGE FIN SEAL MOHAIR	AMESBURY	500187458BKGB
15	25199	MINI BULB VINYL (EPDM)	TREMCO	TX20801E
17	26380	DROP-DOWN SEAL, PLANET	BRIDGEPORT	VARIES
18	-	PANNING SYSTEM	BRIDGEPORT	VARIES
19	26310	FRIJSJURGENS IN-RAIL CLOSER	BRIDGEPORT	100332E

**FENESTRATION TESTING LAB**

REPORT NO: T20-096

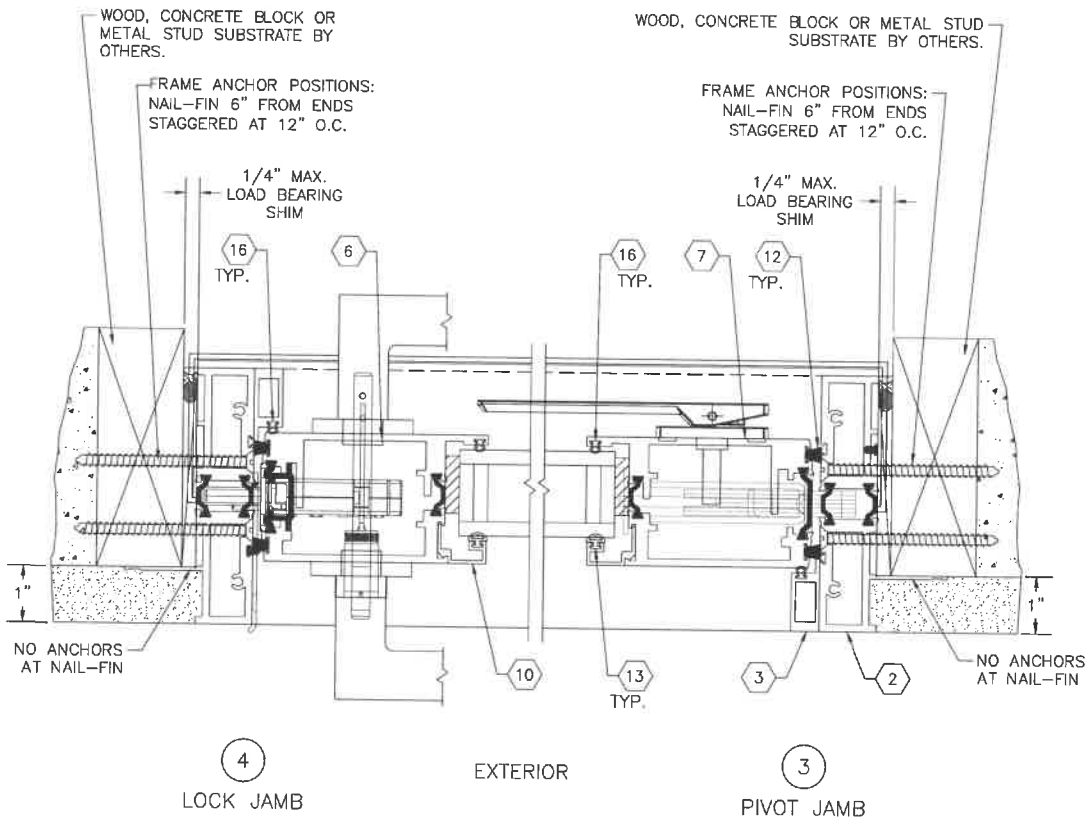
DATE: 11/25/20

*Rough opening was all wood for testing*

<b>DATE:</b> 12/1/20	<b>REVISIONS:</b>	<b>DATE:</b>	<b>COMMENTS:</b>
<b>DRAWN BY:</b> CU			
<b>MATERIAL:</b> Thermally Broken Aluminum		<b>JOB NUMBER:</b> 9803	
<b>CUSTOMER:</b> FLEETWOOD WINDOWS AND DOORS		<b>JOB NAME:</b> 440-T Cert Testing	
<b>FLEETWOOD WINDOWS &amp; DOORS</b> www.fleetwoodusa.com			
<b>SCALE:</b> 1" = 1"			
<b>DRAWING NO.:</b> 2			
<b>SHEET:</b> 2 OF 4			

1/2" NPT COUPLING (1 1/16" O.D. X 5/8") WELDED BY FLEETWOOD UNLESS OTHERWISE NOTED

1" NPT COUPLING (1 5/8" O.D. X 7/8") WELDED BY FLEETWOOD UNLESS OTHERWISE NOTED



ITEM NO.	FLEETWOOD PART NO.	PART DESCRIPTION	VENDOR NAME	VENDOR PART NO.
ALUMINUM EXTRUSIONS				
1	4401	HEAD ASSEMBLY	MERIT	14431 / 14431
2	4402	JAMB	MERIT	14432 / 14432
3	4403	PANEL STOP	MERIT	14433
4	4404	TOP RAIL	MERIT	14434 / 14435
5	4405	BOTTOM RAIL	MERIT	14436 / 14437
6	4407	MULTIPOINT LOCK STILE ASSEMBLY	MERIT	14440 / 14441
7	4408	ARCHETYPE LOCK STILE ASSEMBLY	MERIT	14440 / 14441
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12	19117	LARGE FIN SEAL MOHAIR	AMESBURY	29027045BKGB
13	25031	LARGE BULB VINYL (EPDM)	TREMCO	TX1963BE
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17	26380	DROP-DOWN SEAL, PLANET	BRIDGEPORT	VARIES
18	-	PANNING SYSTEM	BRIDGEPORT	VARIES
19	26310	FRITSJURGENS IN-RAIL CLOSER	BRIDGEPORT	100332E

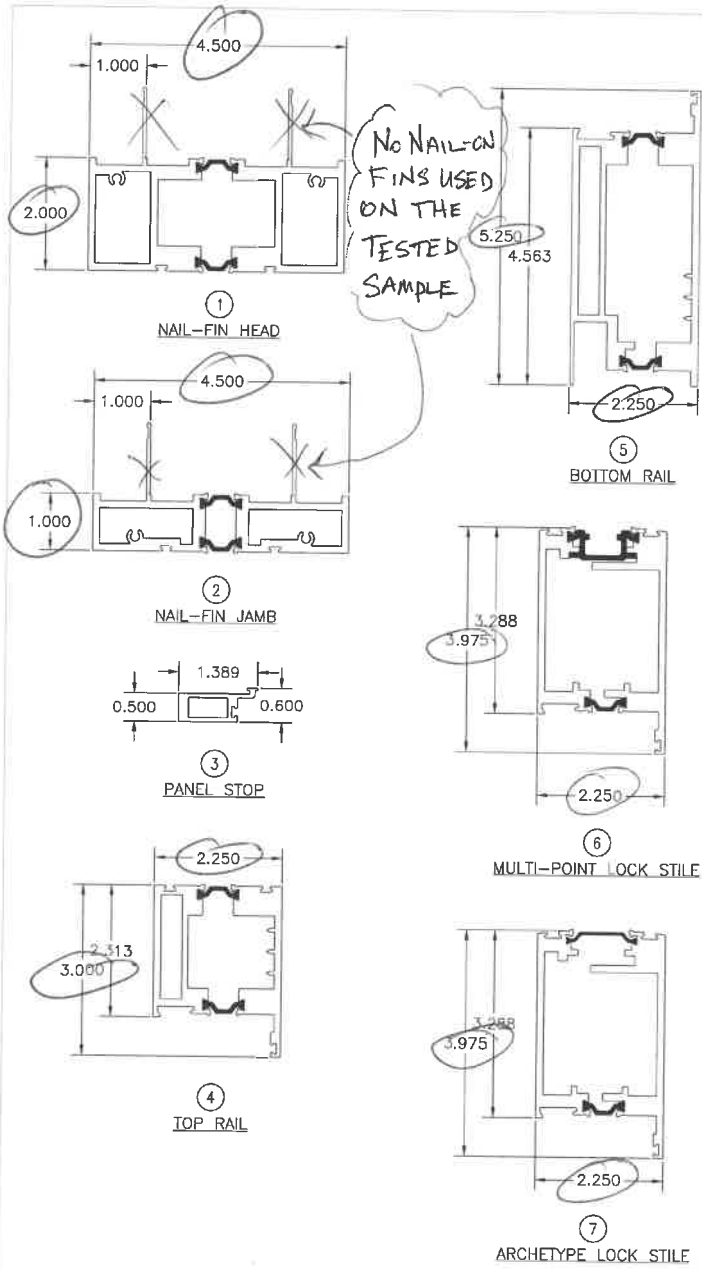
**FENESTRATION TESTING LAB**

REPORT NO: **720-096**

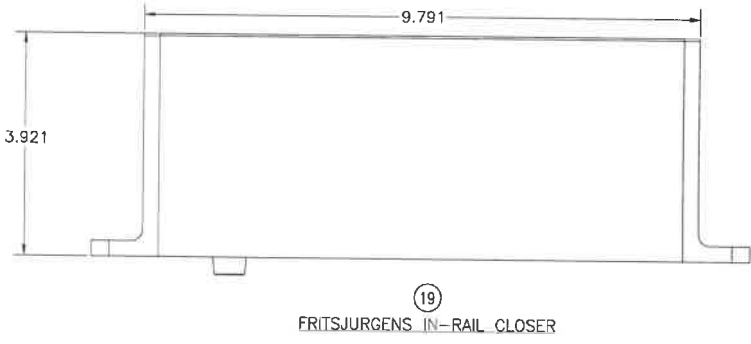
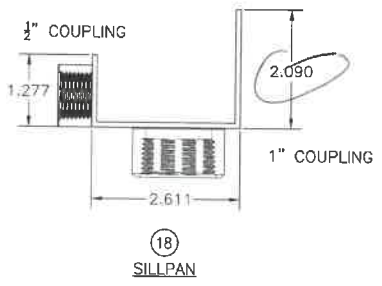
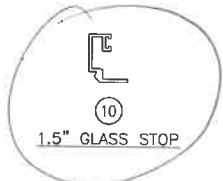
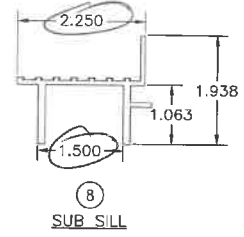
DATE: **11/25/20**

DRAWN BY	DATE	REVISIONS	DATE	COMMENTS
CJ	12/20			
DRAWN BY: CJ		JOB NUMBER: 9893		
MATERIAL: Thermally Broken Aluminum				
CUSTOMER: FLEETWOOD WINDOWS AND DOORS				
JOB NAME: 400-T Curt Testing				
<b>FLEETWOOD</b> WINDOWS & DOORS 1 FLEETWOOD WAY CORONA, CA 92709 www.fleetwoodusa.com				
SCALE: 1" = 1"				
DRAWING NO. 3				
SHEET 3 OF 4				





No NAIL-ON  
FINS USED  
ON THE  
TESTED  
SAMPLE



ITEM NO.	FLEETWOOD PART NO.	PART DESCRIPTION	VENDOR NAME	VENDOR PART NO.
ALUMINUM EXTRUSIONS				
1	4401	HEAD ASSEMBLY	MERIT	14431/14431
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REPORT NO: **T20-096**

DATE: **11/25/20**

MATERIAL: Thermally Broken Aluminum	DATE: 12/1/20	DRAWN BY: CJ	COMMENTS:
CUSTOMER: FLEETWOOD WINDOWS AND DOORS	JOB NUMBER: 9863		
1 FLEETWOOD WAY CORONA, CA 92879 www.fleetwoodlab.com			
SCALE: 1" = 1"		DRAWING NO. 4	
SHEET 4		OF 4	