Fenestration Testing Laboratory, Inc.

10235 8th Street, Rancho Cucamonga, CA 91730

Report #: T18-020

REPORT SUMMARY:

REPORT #:
T18-020

TESTED FOR:
Fleetwood Windows & Doors
1 Fleetwood Way
Corona, CA 92879

SERIES & PRODUCT TYPE:
4070-T - THERMALLY BROKEN ALUMINUM MULTI-SLIDE DOOR

CONFIGURATION:
XXX

FRAME SIZE:
8108.95 mm x 3657.60 mm (319.25" x 144.00")

SPECIFICATION:
NAFS - North American Fenestration Standard/specification for windows, doors, and skylights
AAMA/WDMA/CSA 101/I.S.2/A440-11

PRIMARY DESIGNATOR:
With shoot Bolts
CLASS R-PG20 8108.95 x 3657.60 mm (319.25 x 144.00 in) Type: SD

Without shoot bolts
CLASS R-PG20 8108.95 x 3657.60 mm (319.25 x 144.00 in) Type: SD

TEST COMPLETION DATE: March 12, 2018

REPORT DATE: April 12, 2018

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 MULTI-SLIDE DOOR described in paragraph 4.0 of this report.

3.0 Test References:
3.1 NAFS - North American Fenestration Standard/specification for windows, doors, and skylights AAMA/WDMA/CSA 101/I.S.2/A440-11
3.2 ASTM F 842-17 Forced Entry Resistance Tests for Windows
3.3 CAWM 300-96 Forced Entry Test for Sliding Glass Doors

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 CLASS R-PG20 8108.95 x 3657.60 mm (319.25 x 144.00 in) Type: SD

5.0 Sample Submitted:
5.1 Product Type: THERMALLY BROKEN ALUMINUM MULTI-SLIDE DOOR
5.2 Series: 4070-T
5.3 Configuration: XXX (references to left panel or right panel are as seen from outside)
5.4 Product Dimensions:

	Millimeters	Inches
Total Frame:	8108.95 x 3657.60	319.25 x 144.00
Left Panel:	2898.90 x 3565.65	114.13 x 140.38
Center Panel:	2640.08 x 3565.65	103.94 x 140.38
Right Panel:	2649.47 x 3565.65	104.31 x 140.38

5.5 Glass and Glazing: Applies to all three panels

IGU Thickness	*Spacer Type*	*Interior Lite*	*Exterior Lite*	*Glazing method*
1.5" overall wide	Metal box type	3/8" Tempered	3/8" Tempered	The glass was outside glazed onto pull-in bulb vinyl. A ¼" x ¼" x 12" heal bead of silicone was applied in both directions at all corners. An additional 24" long heal bead was applied at mid-span on each stile. Aluminum glazing stop was applied full perimeter from the outside and each stop contained a pull-in bulb vinyl.

5.6 Weepage: The SGD was tested twice for air infiltration and twice for water penetration with two different weep configurations.

Configuration #1 –
1/2" weep holes in front face (referred to as "side" by Fleetwood) of the pan.
The sill or threshold sat in an aluminum pan with upturned legs on all four sides (refer to attached drawings page 2). On the outside face of the pan, there were six (6) 0.5" diameter weep holes located as follows: One 8" from each end, then measuring from the left side, one 60" on center. The location of the fifth weep was mid-span between the fourth weep from the left and the first weep from the right.

5.6 Weepage: (Continued)

Configuration #2 – **1" Vertical weep holes in bottom of the pan.** The sill or threshold sat in an aluminum pan with upturned legs on all four sides (refer to attached drawings page 2). In line with the outermost roller track, the pan contained six (6) 1" diameter vertical weep holes located as follows: One 8" from each end, then measuring from the left side, one 60" on center. The location of the fifth weep is mid-span between the fourth weep from the left and the first weep from the right.
Common to both weep configurations was the following: In line with each weep, the vertical legs at the bottom of each sill extrusion was notched 2.13" x 0.75". The innermost sill extrusion contained an extruded fin parallel to the sill that was notched 2.13" x 0.63". This same fin served as a spacer to maintain an even 1/8" wide full length drain on the inboard side of the sill.

5.7 Pressure balancing: None

5.8 Weather-stripping:

Type	*Quantity*	*Location*
0.200" overall high Q-lon foam filled bulb vinyl	Four (4) strips	Two strips in the left side lock jamb channel (outermost channel) – one strip facing in and one strip facing out. Two strips in the right side lock jamb channel (innermost channel) – one strip facing in and one strip facing out.
0.200" overall high polypile with center fin	Six (6) strips	Head – two strips per channel; one strip facing in and one strip facing out per channel.
0.447" overall high Q-lon foam filled flap	Six (6) strips	Bottom rails - Two strips and each panel at bottom rail facing down.
0.230" overall high polypile with center fin	Four (4) strips	Interlock stiles – each interlock contained a strip facing the mating interlock stile.
Flexible PVC air barrier	Two (2)	One on the right panel interlock facing in. One on the center panel left interlock facing in.

5.9 Sealants:

The pan was set in a bed of sealant and the nail-on fin was sealed to the rough opening (no screws into nail-on fin). Refer to "Glazing" for the heal bead of sealant applied at glazing.

5.10 Hardware:

Type	*Quantity*	*Location*
Dual tandem steel roller (4 wheels)	Six (6)	Bottom rail of each panel – one dual tandem roller at each end of each bottom rail.
Metal mortise lock and recessed pull	Two (2)	One lock on each jamb stile – left panel left stile and right panel right stile. Each lock hook was located 44" from the bottom of the panel and fastened to the stile with screws. The recessed pull and lock engagement control was located 38" from the bottom and fastened from the inside with a pair of screws. When locked, each lock engaged its respective metal strike plate fastened to its respective jamb with a pair of screws.

5.10 Hardware: (Continued)

Additional hardware to pass DP20		
Type	***Quantity***	***Location***
Steel recessed set of top and bottom shoot bolts	Two (2) sets	Center panel left interlock and right panel interlock – each had one set with the lever control located 48" from bottom of the panel and was fastened with a pair of screws from the inside. When locked, each bolt engaged a steel shoot bolt strike block fastened with four screws respectively; one strike block in the sill and one strike block in the head.

5.11 Construction:

Location	***Joinery Type***	***Number of Fasteners***	***Fastener Size***
Frame corners – applied through jambs and into the sill and head screw races	Mechanically joined with screws	Six (6) at each jamb to head corner. Five (5) at each jamb to sill corner	#10 x 1.5" PPH
Sash corners – applied through stiles and into rails	Mechanically joined with screws	Four (4) per corner	#8 x 3" PFH
The individual frame head and jamb extrusions and the panel rails and stiles were all thermally broken with struts.			
The sill, head, and jambs were each formed by joining three extrusions respectively. The sill parts mated directly; aluminum extrusion to aluminum extrusion. The head and jamb channels were joined to their respective channels with an I-strut. At sill, the three parts were further joined by a 3.5" x 1" x 0.12" metal plate applied at each weep notch and fastened with a pair of ¼" x 0.5" PPH screws; one screw into bottom of innermost extrusion and one screw into the outermost extrusion.			
At sill, the space between roller tracks was completely filled to the height of the highest point of the extrusions with a smooth and flat material to which the Q-lon on the bottom rails made contact.			
Aluminum snap-in jamb fillers were applied to the non-lock channels in each jamb.			

5.12 Reinforcement: None

5.13 Installation:

The nail-on fin located at each jamb and at the head was sealed to the rough opening but no fasteners were applied through the nail fins.
The head and jambs were anchored to the rough opening with #8 x 2" screws as follows: A row of five screws 6" from each end and 12" on center in the field. Two screws in the innermost channel and in the center channel and one screw in the outermost channel.

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 refer to the corresponding sections in the NAFS.

9.3.1 – Operation Force (ASTM E2068-00(2016))

Test Description	Results	Allowed	Comments
Maximum force to initiate motion	89.40 N (20.10 lbf)	135 N (30.35 lbf)	
Maximum force to maintain motion	53.82 N (12.10 lbf)	90 N (20.23 lbf)	
Latching device force	17.79 N (4.00 lbf)	100 N (22.48 lbf)	

9.3.2 – Air Exfiltration (ASTM E283-04(2012)) - With 1" weep holes at bottom of pan

Test Description	Results	Allowed	Comments
75 Pa differential pressure	0.90 L/s*m^2	1.5 L/s*m^2	
1.57 psf differential pressure	0.18 cfm/ft^2	0.30 cfm/ft^2	
The tested specimen meets the A2 Canadian air exfiltration performance requirements specified in AAMA/WDMA/CSA 101/ I.S.2/A440 for air leakage resistance.			

9.3.2 – Air Exfiltration (ASTM E283-04(2012)) - With 0.5" weep holes at outside face of pan

Test Description	Results	Allowed	Comments
75 Pa differential pressure	0.90 L/s*m^2	1.5 L/s*m^2	
1.57 psf differential pressure	0.17 cfm/ft^2	0.30 cfm/ft^2	
The tested specimen meets the A2 Canadian air exfiltration performance requirements specified in AAMA/WDMA/CSA 101/ I.S.2/A440 for air leakage resistance.			

9.3.3 – Water Penetration (ASTM E547-00(2016)) - With 1" weep holes at bottom of pan

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

9.3.3 – Water Penetration (ASTM E547-00(2016)) - With 0.5" weep holes at outside face of pan

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) – Without Shoot Bolts

Test Description	Results	Allowed	Comments
DP15 - 720 Pa (15.04 psf) Pos	40.13 mm (1.58")	Report only	2
DP15 - 720 Pa (15.04 psf) Neg	43.43 mm (1.71")	Report only	2

9.3.4.3 – Uniform Load Structural at 1.5 x Design Pressure (ASTM E330-14) – With Shoot Bolts

Test Description	Results	Allowed	Comments
OL for DP15 - 1080 Pa (22.56 psf) Pos	0.00 mm (0.00")	14.22 mm (0.56")	2
OL for DP15 - 1080 Pa (22.56 psf) Neg	0.00 mm (0.00")	14.22 mm (0.56")	2

9.3.4.2 – Uniform Load Deflection at Design Pressure (ASTM E330-14) – Without Shoot Bolts

Test Description	Results	Allowed	Comments
DP20 - 960 Pa (20.05 psf) Pos	40.13 mm (2.27")	Report only	2
DP20 - 960 Pa (20.05 psf) Neg	43.43 mm (2.17")	Report only	2

9.3.4.3 – Uniform Load Structural at 1.5 x Design Pressure (ASTM E330-14) – With Shoot Bolts

Test Description	Results	Allowed	Comments
OL for DP20 - 1440 Pa (30.08 psf) Pos	6.35 mm (0.25")	14.22 mm (0.56")	2
OL for DP20 - 1440 Pa (30.08 psf) Neg	3.56 mm (0.14")	14.22 mm (0.56")	2

9.3.5 – Forced Entry Resistance (ASTM F842-17 & CAWM 300-96) – Covered by a different test report

9.3.6.3 – Deglazing Test

Test Description	Results	Allowed	Comments
Active Sash Pull Stile - 320 N (71.94 lbf)	1%	Less than 90% of glazing bite	
Active Sash Rail - 230 N (51.71 lbf)	1%	Less than 90% of glazing bite	

Comment #1 – Tested without an insect screen
Comment #2 – Deflection measurement taken from interlock at left panel to center panel.
Testing was witnessed by: Jim Cruz of FTL and Corey Jones of Fleetwood.

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 die 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 die 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: March 12, 2018

Report Completion Date: April 12, 2018

Pete Cruz - Test Engineer

Jim Cruz – Laboratory Manager

TABLE OF CONTENTS

SHEET NO.

TEST SPECIMEN

1. SERIES / MODEL: 4070-T
2. PRODUCT TYPE: MULTI-SLIDE DOOR WITH 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/I.S.2/A440-11; A440 S1-09 (CANADIAN SUPPLEMENT) – (NON-IMPACT GLAZING)

CORNERS CONSTRUCTION

1. FRAME CORNER: THE JAMBS ARE BUTTED TO THE HEAD AND SILL AND ATTACHED WITH SCREWS.
   PANEL CORNER: THE HORIZONTAL RAILS ARE BUTTED TO THE VERTICALS AND ATTACHED WITH SCREWS.

GLAZING

LITE 1: 1.5": CLEAR 3/8"-T, 0.75 AIR, CLEAR 3/8"-T
LITE 2: 1.5": CLEAR 3/8"-T, 0.75 AIR, CLEAR 3/8"-T
LITE 3: 1.5": CLEAR 3/8"-T, 0.75 AIR, CLEAR 3/8"-T
ALL GLAZING SEALANT DOW CORNING 1199
$\frac{1}{4}$" X $\frac{1}{4}$" X 12" BEAD FROM EACH CORNER OF INNER FLANGE OF PANEL
FOR PANEL HEIGHTS OVER 8 FT. TALL RECOMMENDED AN ADDITIONAL 24" OF SEALANT HALFWAY UP PANEL.

SUB-SILLPAN DRAIN CONNECTION

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

*FRAME ANCHOR REQUIREMENTS TABLE

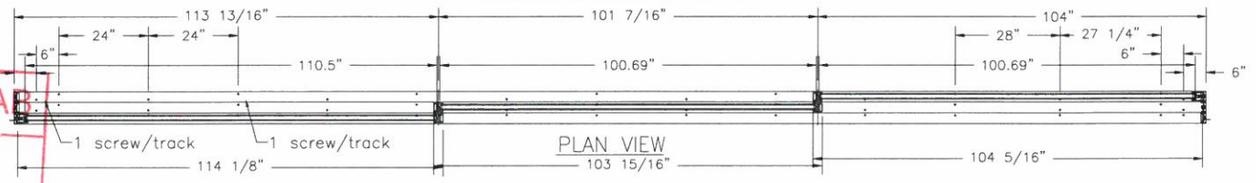
OPENING TYPE (SUBSTRATE)	FRAME TO OPENING FASTENER TYPE	MINIMUM EMBEDMENT	MINIMUM EDGE DIST.
2X_ WOOD FRAME OR BUCK	(1) NO. 8 SMS SCREW	1 1/2"	3/4"
MIN. 18 GA. 33 KSI STEEL STUD	(1) NO. 8 SMS SCREW	FULL	3/8"
CMU/CONCRETE	(2)3/16" CONCRETE SCREWS	1 1/4"	2 5/8"

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

DESIGN PRESSURE TABLE

MAX DOOR HEIGHT	DESIGN PRESSURE (PSF)		
	SHOOT BOLT	POSITIVE	NEGATIVE
144"	YES	25	25
	NO	20	20

THERE ARE NO SCREWS ON NAIL FIN

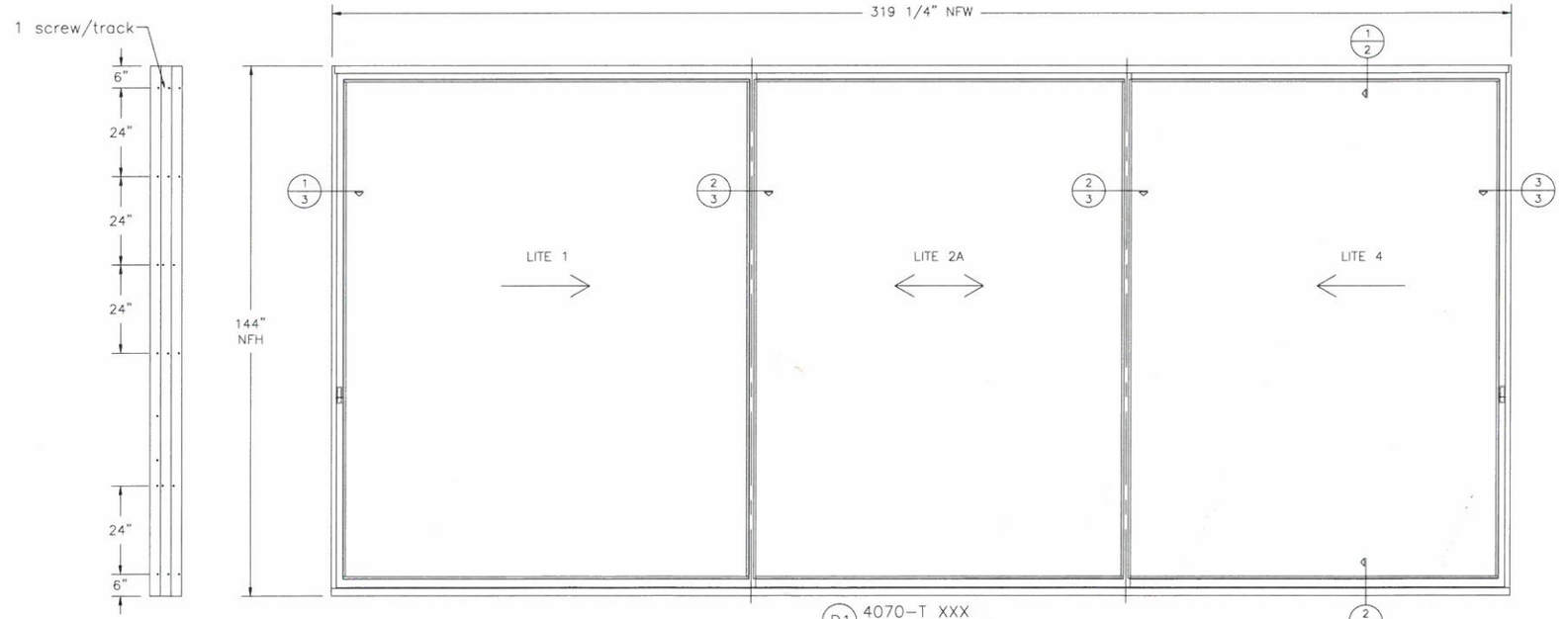


PLAN VIEW

OPENING FORCE

PANEL #	FORCE (LBS)
1	15
2	15
3	15

FENESTRATION TESTING LAB
REPORT NO: T18-020
DATE: 3/15/18



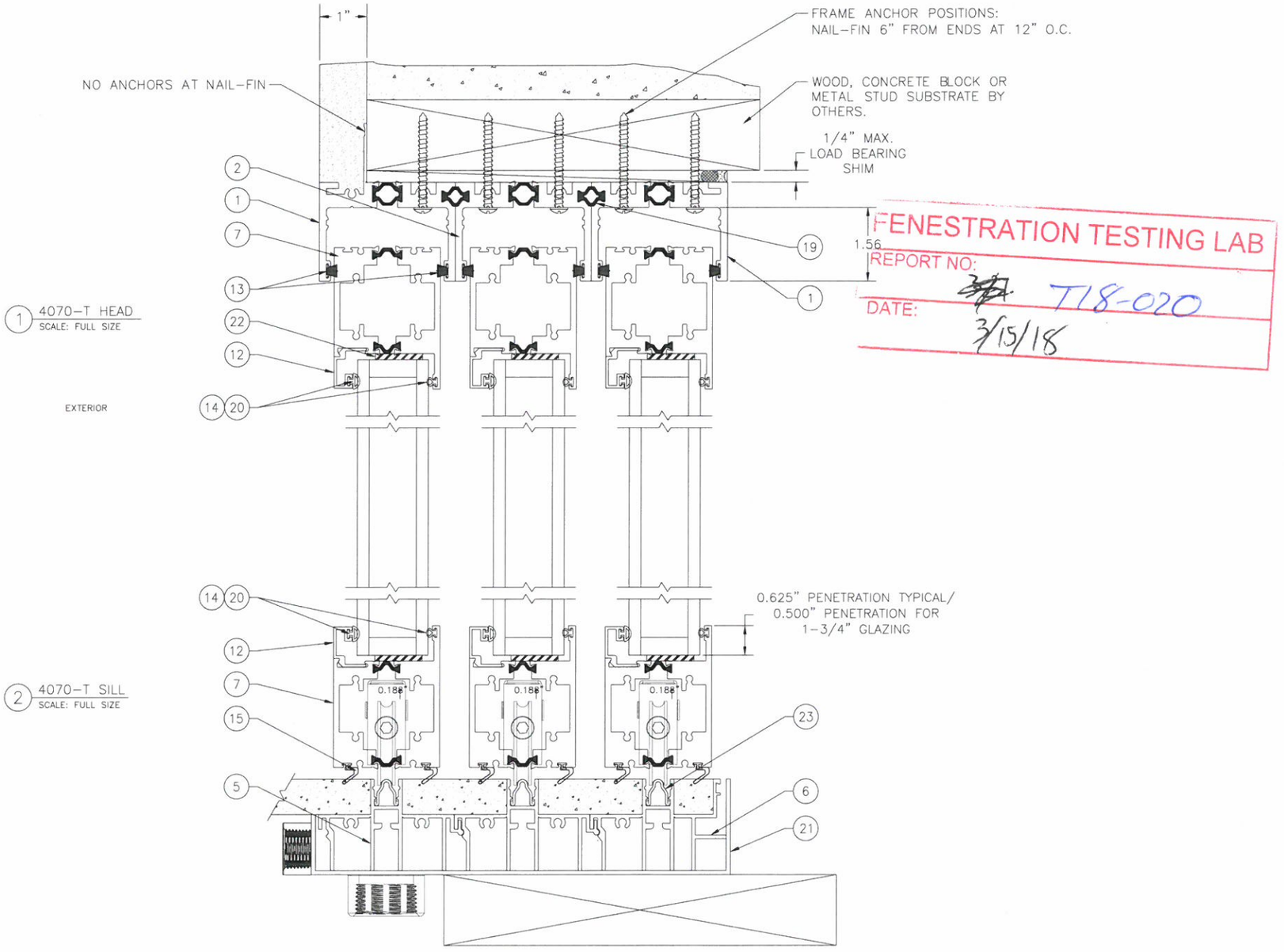
D1 4070-T XXX
SCALE: 3/4" = 1'

REVISIONS	DATE	DRAWN BY	COMMENTS

DATE: 11/2/17
DRAWN BY: CJ
JOB NUMBER: 8226
MATERIAL: 4070-T
CUSTOMER: FLEETWOOD WINDOWS AND DOORS
JOB NAME: 4070-T-CERT. TESTING

FLEETWOOD WINDOWS & DOORS
1 FLEETWOOD WAY
CORONA, CA 92879
www.fleetwoodusa.com

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



1 4070-T HEAD
SCALE: FULL SIZE

2 4070-T SILL
SCALE: FULL SIZE

FENESTRATION TESTING LAB
REPORT NO: T18-020
DATE: 3/15/18

REVISIONS	DATE	DRAWN BY	COMMENTS

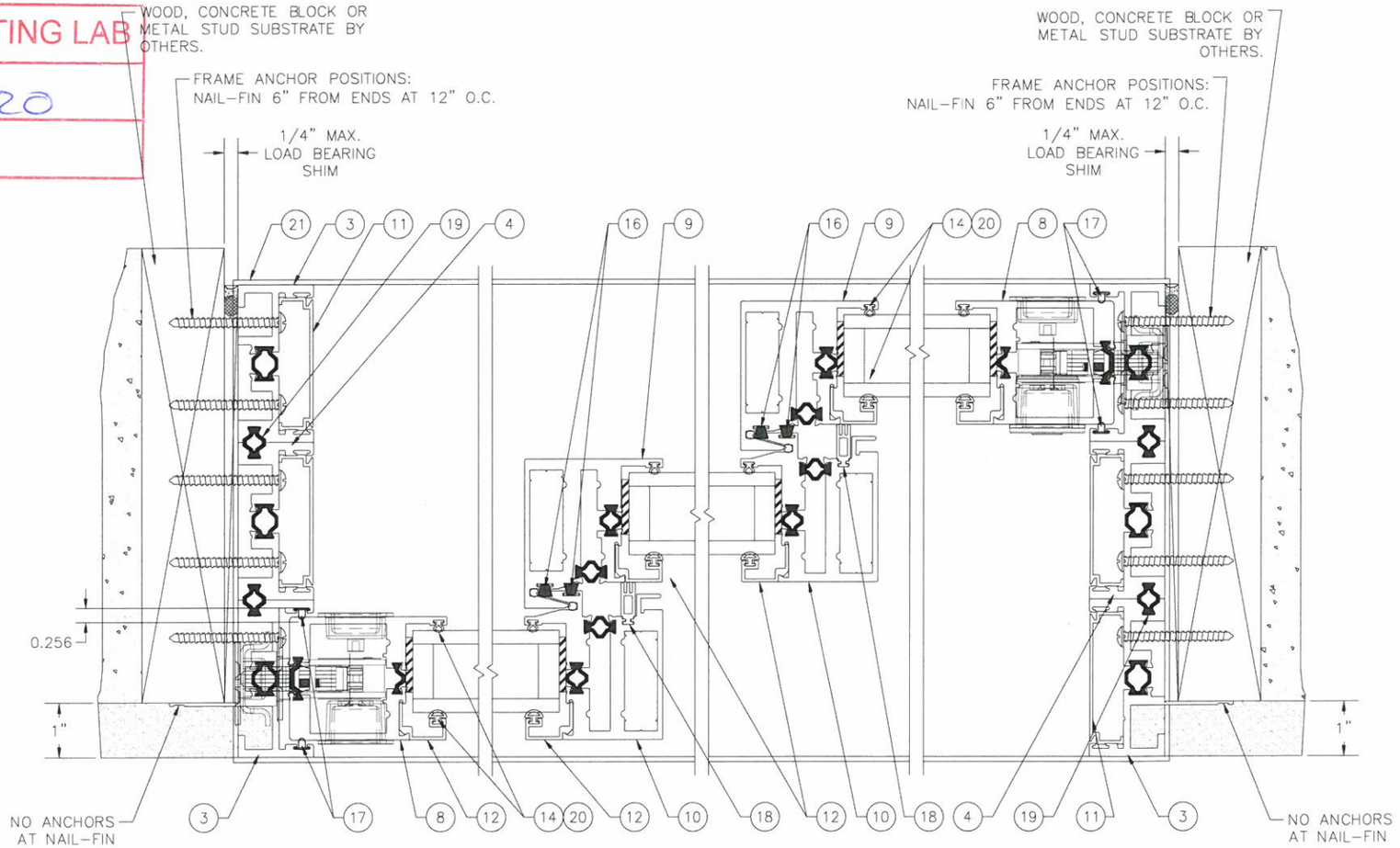
DRAWN BY: CJ
DATE: 11/2/17
JOB NUMBER: 8226

MATERIAL: 4070-T
CUSTOMER: FLEETWOOD WINDOWS AND DOORS
JOB NAME: 4070-T-CERT. TESTING

FLEETWOOD WINDOWS & DOORS
1 FLEETWOOD WAY
CORONA, CA 92879
www.fleetwoodusa.com

SCALE : 1' = 1'
DRAWING NO. : 2
SHEET : 2 OF 4

FENESTRATION TESTING LAB
REPORT NO: T18-020
DATE: 3/15/18



1 4070–T LOCK JAMB SCALE: FULL SIZE

2 4070–T INTERLOCKERS SCALE: FULL SIZE

2 4070–T INTERLOCKERS SCALE: FULL SIZE

5 4070–T LOCK JAMB SCALE: FULL SIZE

25757 Q–LON FOAM SEAL, Q200T270 AMESBURY (Q200T270)

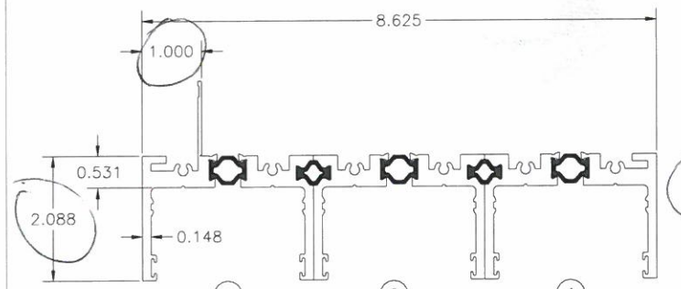
COMMENTS | DRAWN BY | DATE | REVISIONS

DRAWN BY: CJ
DATE: 11/2/17
JOB NUMBER: 8226

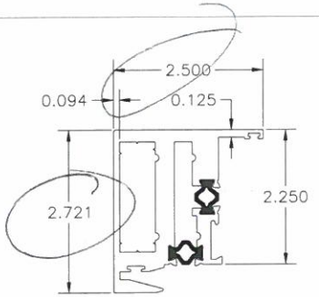
MATERIAL: 4070-T
CUSTOMER: FLEETWOOD WINDOWS AND DOORS
JOB NAME: 4070-T-CERT. TESTING

FLEETWOOD WINDOWS & DOORS
1 FLEETWOOD WAY
CORONA, CA 92879
www.fleetwoodusa.com

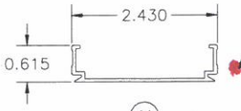
SCALE : 1" = 1'
DRAWING NO. : 3
SHEET : 3 OF 4



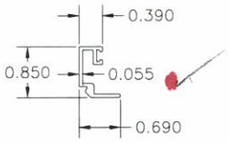
1 NAIL-FIN HEAD | 2 BLOCK HEAD | 1 NAIL-FIN HEAD



9 SLIDING INTERLOCKER

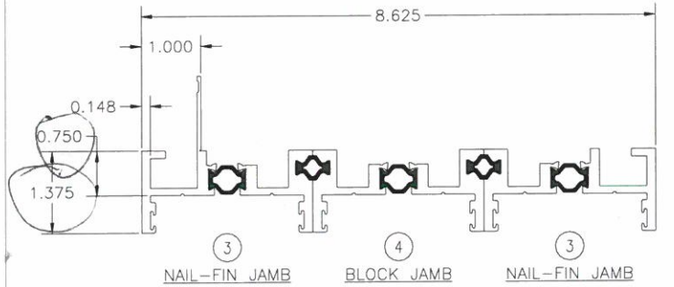


11 JAMB FILLER

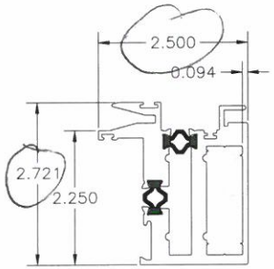


12 1.5" GLASS STOP

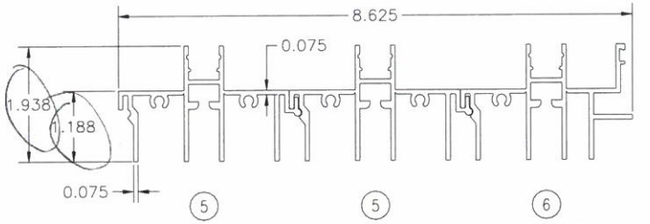
ITEM #	PART	ITEM DESCRIPTION	MANUFACTURER/NOTES
		PARTS	
1	4701	NAIL-FIN HEAD	6063-T6 ALUMINUM EXTRUSION
2	4702	BLOCK HEAD	6063-T6 ALUMINUM EXTRUSION
3	4703	NAIL-FIN JAMB	6063-T6 ALUMINUM EXTRUSION
4	4704	BLOCK JAMB	6063-T6 ALUMINUM EXTRUSION
5	4707	SILL	6063-T6 ALUMINUM EXTRUSION
6	4719	WATER CHANNEL SILL	6063-T6 ALUMINUM EXTRUSION
7	4709	TOP & BOTTOM RAIL	6063-T6 ALUMINUM EXTRUSION
8	4710	LEAD STILE	6063-T6 ALUMINUM EXTRUSION
9	4712	SLIDING INTERLOCKER	6063-T6 ALUMINUM EXTRUSION
10	4711	FIXED INTERLOCKER	6063-T6 ALUMINUM EXTRUSION
11	4705	JAMB FILLER	6063-T6 ALUMINUM EXTRUSION
12	3908	1.5" GLASS STOP	6063-T6 ALUMINUM EXTRUSION
		SEALS & SEALANTS	
13	25912	SMALL FIN SEAL .200	AMESBURY (20027045BKGB)
14	25031	Bulb Vinyl-Large (EPDM 70 Durometer, ASTM C864)	TREMCO, #TX19638E
15	25929	Q-Lon Foam Seal	AMESBURY, QEZ447-1
16	19118	SMALL FIN SEAL .230	AMESBURY (23027045BKGB)
17	25757	Q-Lon Foam Seal	SCHLEGEL, Q-Lon Q200T270
18	26046	FLEXIBLE VINYL AIR BARRIER	RYKO
19	25065	14.6mm X 10.2mm - I-STRUT	TECHNOFORM, 259900
20	25199	Mini Bulb Vinyl (EPDM 70 Durometer, ASTM C864)	TREMCO, TX20801E
		MISCELLANEOUS	
21	TBD	SUB-SILLPAN	ALUMINUM
22	18621	4" X 1/8" X 1" SETTING BLOCK	AS REQ'D
23	23006	STAINLESS STEEL TRACK 9/16" (SLIDING DOORS) .035"	HAAG & ASSOCIATES, FW-1020
24	25223	SHOOT BOLT LATCH SECURED WITH #8-32 .875" SCREW	TRUTH HARDWARE
25	26134	SHOOT BOLT SILL BLOCK	D&B FABRICATION



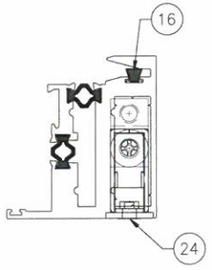
3 NAIL-FIN JAMB | 4 BLOCK JAMB | 3 NAIL-FIN JAMB

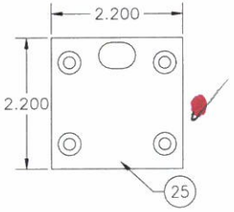


10 FIXED INTERLOCKER

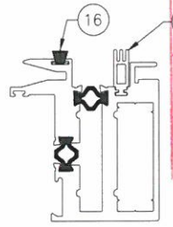


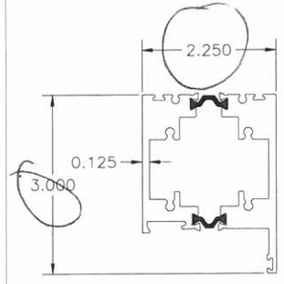
5 SILL | 5 SILL | 6 WATER CHANNEL SILL



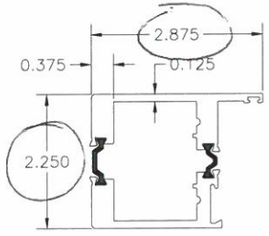


FLEXIBLE VINYL AIR BARRIER TO RUN FULL LENGTH FROM SILL TO HEAD.

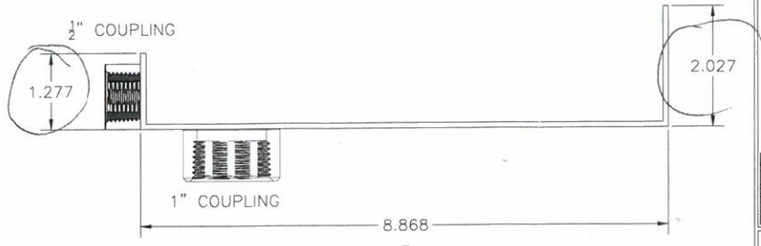




7 TOP & BOTTOM RAIL



8 LEAD STILE



21 SUB-SILLPAN

REGISTRATION TESTING LAB
REPORT NO: 18-020
DATE: 3/15/18

COMMENTS	
DRAWN BY	
DATE	
REVISIONS	
DATE:	9/28/17
DRAWN BY:	CJ
JOB NUMBER:	5684
MATERIAL	4070-T
CUSTOMER	FLEETWOOD WINDOWS AND DOORS
JOB NAME	4070-T-CERT TESTING

FLEETWOOD WINDOWS & DOORS
1 FLEETWOOD WAY
CORONA, CA 92879
www.fleetwoodusa.com

SCALE : 1" = 1"
DRAWING NO. : 4
SHEET : 4 OF 4