



Testing Evaluation Laboratories, Inc.
2002 Wood Court Suite 1 – Plant City, FL 33563
Phone: 813-754-9887

AAMA/WDMA/CSA 101/I.S.2/A440-08
Canadian Supplement A440S1-09

TEST REPORT SUMMARY

Test Report Issued To:

FLEETWOOD WINDOWS AND DOORS
1 Fleetwood Way
Corona, CA 92879

KONA 3800 Non-Impact Aluminum Casement Windows

Title	Summary of Results
Primary Product Designator	Class LC- PG65 1067 x 2135 (42 x 84) Type C
Design Pressure	+3112/-3112 Pa (+65.0/- 65.0 psf)
Operating Force	Pass
Air Infiltration	0.050 L/s•m ² (0.010 scfm/ft ²)
Air Infiltration/Exfiltration (A440S1-09)	Level A3: < 0.50 L/s•m ²
Water Resistance	467 Pa (9.75 psf)
Structural Test Pressure	+4668/-4668 Pa (+97.5/- 97.5 psf)
Forced Entry	No Entry

Reference should be made to Report No. TEL 01990815 for complete test results for AAMA/WDMA/CSA 101/I.S.2/A440-08.

For Testing Evaluation Laboratories, Inc.

Vivian K. Wright,
President



Testing Evaluation Laboratories, Inc.

2002 Wood Court Suite 1 – Plant City, FL 33563
Phone: 813-754-9887

AAMA/WDMA/CSA 101/I.S.2/A440-08
Canadian Supplement A440S1-09

Issued to:

FLEETWOOD WINDOWS AND DOORS
1 Fleetwood Way
Corona, CA 92879

IAS Lab Certification Number: TL-299

Report No: TEL 01990815
Test Dates: October 3, 2013
Report Date: October 31, 2013

Project Summary: Testing Evaluation Laboratories, Inc. (TEL) was contracted by Fleetwood Windows and Doors to perform tests on the Kona 3800 Casement and Awning Windows at TEL's Plant City, FL test facility. Performance Grade Class LC-PG65 1067 x 2134 (42 x 84) Type C was successfully achieved by this specimen.

Test specimen descriptions and results are reported herein.

Test Specifications: The test specimens were evaluated in accordance with the following:

AAMA/WDMA/CSA 101/I.S.2/A440-08 and Canadian Supplement A440S1-09
Standard Specification for Windows, Doors and Unit Skylights

Test Specimen Description:

Series / Model: Kona 3800 Casement and Awning Windows
Type: Aluminum Casement and Awning Windows
Overall Size: 1067 mm x 2135 mm (42.00" x 84.00") – (X)
Daylight Opening: 840 mm x 1908 mm (33.063" x 75.13") – (X)
Glazing Detail: See attached drawing numbers L-7031A for glazing details.
Frame Material: Aluminum
Finish: Mill Finish

For Tested Elevation, Vertical Cross Sections, Horizontal Cross Sections, Components, Frame Anchoring, Glazing Detail and Bill of Materials See Attached Drawing number L-7031A.

Test Results: Specimen 1 – Class LC-PG65 1067 x 2134 (42 x 84) Type C - Aluminum Casement Window (X)

The test results are tabulated as follows:

<u>Paragraph</u>	<u>Title of Test – Test Method</u>	<u>Results</u>	<u>Allowed</u>
5.3.1	Operating Force per ASTM E2068-00		
	Initiate Motion	19 N (4.2 lbf)	Report Only
	Maintain Motion	11 N (2.5 lbf)	45 N (10.00 lbf)
	Latches	36 N (8.1 lbf)	100 N (22.5 lbf)
5.3.2.1	Air Infiltration per ASTM E283 @ 75 Pa (1.57 psf)	0.050 L/s/m ² (0.010 SCFM/FT ²)	1.5 L/s/m ² (0.30 SCFM/FT ²)
	Air Infiltration per ASTM E283 @ 299 Pa (6.24 psf)	0.525 L/s/m ² (0.065 SCFM/FT ²)	1.5 L/s/m ² (0.30 SCFM/FT ²)
	Air Exfiltration per ASTM E283 @ 75 Pa (1.57 psf)	0.200 L/s/m ² (0.040 SCFM/FT ²)	1.5 L/s/m ² (0.30 SCFM/FT ²)
	Air Exfiltration per ASTM E283 @ 299 Pa (6.24 psf)	0.605 L/s/m ² (0.121 SCFM/FT ²)	1.5 L/s/m ² (0.30 SCFM/FT ²)
Note #1:	<i>The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-08 (A440S1-09) for air infiltration/exfiltration.</i>		
5.3.3.2	Water Resistance per ASTM E547		See Note #2
5.3.4.2	Uniform Load Structural per ASTM E330		See Note #2
Note #2:	<i>The client opted to start at a pressure higher than the minimum required. Those results are listed under "Optional Performance".</i>		
5.3.5	Forced Entry resistance per ASTM F588 Type B Grade 10		
	Disassembly Test	No Entry	No Entry
	Test B1 – B3	No Entry	No Entry
	Sash/Panel Manipulation Test	No Entry	No Entry
	Lock Manipulation Test	No Entry	No Entry
5.3.6.4.3	Sash Vertical Deflection Test 270N (60 lbf)	(9.881 mm (0.389"))	20.3 mm (0.80") Max
5.3.6.6.2	Distributed Load Test 300 Pa (6.2 psf)	No Damage	No Damage
Optional Performance			
4.3.2.1	Water Resistance per ASTM E547 (without insect screen) 467 Pa (9.75 psf)	No Leakage	No Leakage

Specimen 1: Optional Performance – Continued

4.4.2.6 Optional Performance

Range	Time (seconds)	Load Pa (psf)	Location	Deflection mm (in.)	Allowable mm (in.)
Half Test Positive	30	1556 (32.50)			
Test Positive	30	3112 (65.00)	1	0.406 (0.016)	See Note #3
Half Test Negative	30	1556 (32.50)			
Test Negative	30	3112 (65.00)	1	1.702 (0.067)	See Note #3

Note #3: *The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-08 (A440S1-09) for this product designation. The deflection data is recorded in this report for special code compliance and information only. See Note #4 for deflection locations.*

Range	Time (seconds)	Load Pa (psf)	Location	Deflection mm(in.)	Set mm(in.)	Allowable mm(in.)
Half Proof Positive	10	2334 (48.75)				
Proof Positive	30	4668 (97.50)	1	1.702 (0.067)	0.584 (0.023)	3.810 (0.150)
Half Proof Negative	10	2334 (48.75)				
Proof Negative	30	4668 (97.50)	1	2.134 (0.084)	0.635 (0.025)	3.810 (0.150)

Note #4: *Deflection/Set for Location 1 measured at center of top rail.*

Conditions, Terms, and General Notes Regarding These Tests

The product tested Has Been compared to the detailed drawing, bill of materials and fabrication information supplied by the client so named herein. Our analysis, which includes dimensional and component description comparisons, indicate the tested product and engineering information supplied by the client "Are Equivalent". The report and representative samples will be retained for four years from the date of initial test.

These test results were obtained by employing all requirements of the designated test methods with no Deviations unless explicitly noted in test report. The test results and specimen supplied for testing are in compliance with the reference.

The test results are specific to the product tested by this laboratory and of the sample supplied by the client named herein, and they relate to no other product either manufactured by the client, a fabricator of the client or of the client or of installed field performance.

This test report does not constitute certification of this product, but only that the above test results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Testing Evaluation Laboratories, Inc. makes no opinions or endorsements regarding this product and its performance. This report may not be reproduced or quoted in partial form without the expressed written approval of Testing Evaluation Laboratories, Inc.

Testing Evaluation Laboratories, Inc.'s letter, reports, its name or insignia or mark are for the exclusive use of the client so named herein and any other use is strictly prohibited. The report, letters and the name of Testing Evaluation Laboratories, Inc., its seal or mark shall not be used in any circumstance to the general public or in any advertising.

Limitation of liability: Due diligence was used in performing the tests and reporting the results. By acceptance of this report, this client agrees to hold harmless and indemnify Testing Evaluation Laboratories, Inc., its employees, subcontractors and officers and owners against all claims and demands of any kind whatsoever, which arise out of or in any manner connected with the performance of work referred to herein.

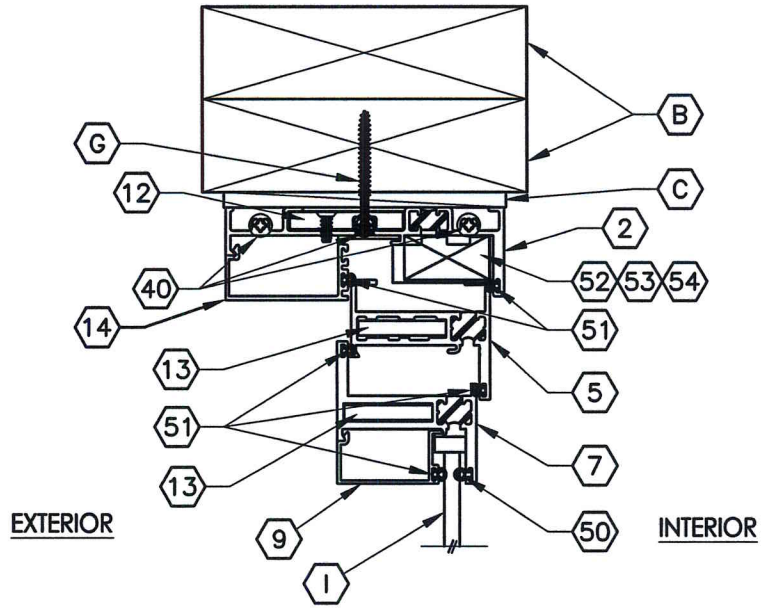
Testing Evaluation Laboratories, Inc.



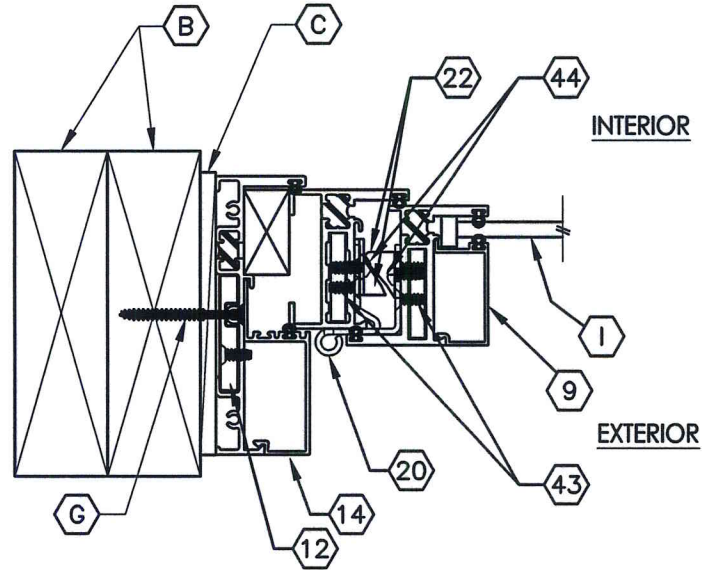
Vivian K. Wright,
President

Revision Log

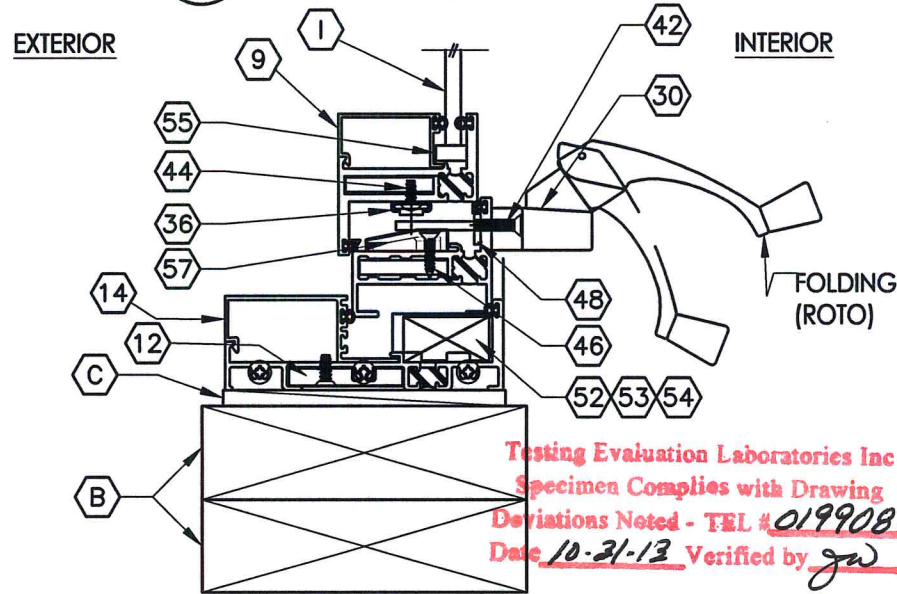
Rev No.	Date	Page(s)	Revision(s)
0	10/21/2013	NA	Original Report Issue



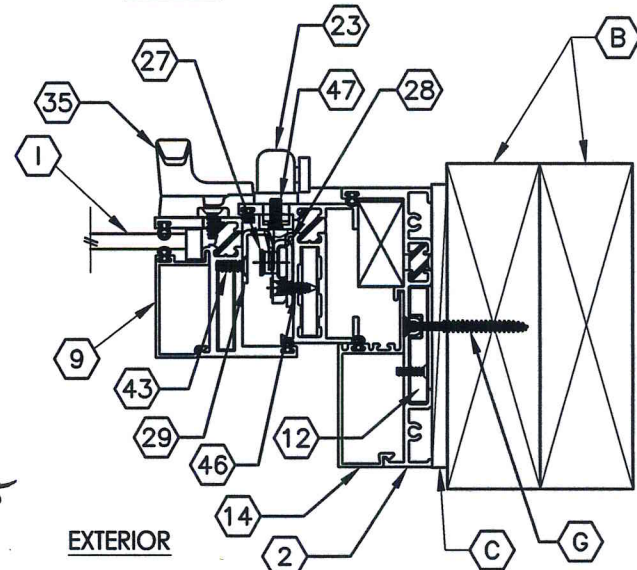
1
2 VERTICAL CROSS SECTION



3
2 HORIZONTAL CROSS SECTION



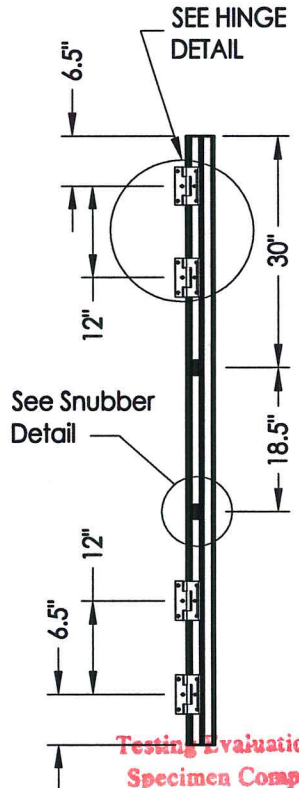
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2 VERTICAL CROSS SECTION



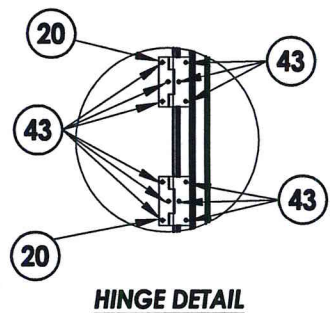
4
2 HORIZONTAL CROSS SECTION

Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01990815
 Date 10-21-13 Verified by *gw*

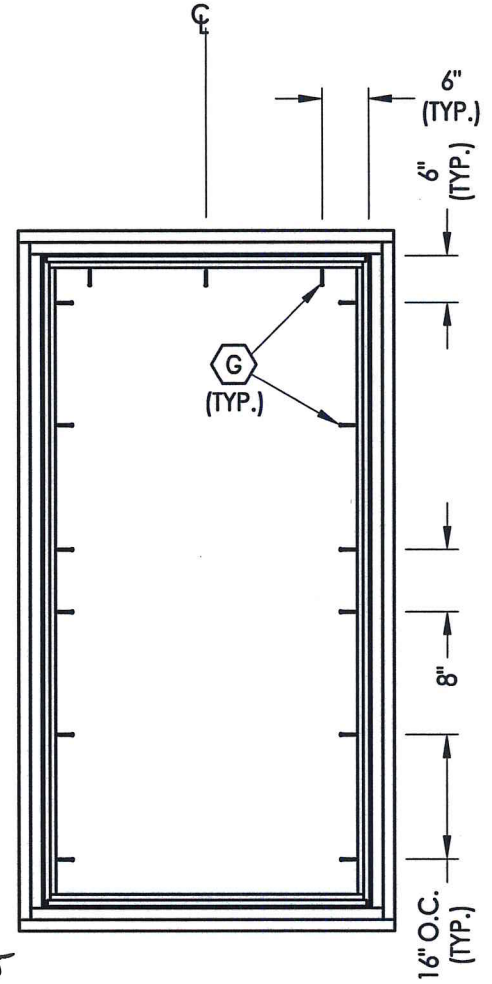
PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		HORIZONTAL AND VERTICAL CROSS SECTIONS	
NO.	DATE	REVISIONS	BY
 RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE:		9/25/13	
SCALE:		N.T.S.	
DWG. BY:		JK	
CHK. BY:		LFS	
DRAWING NO.:		L-7031A	
SHEET		2 OF 5	



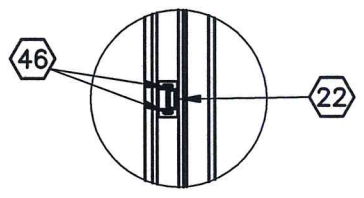
Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01990815
 Date 10-31-13 Verified by gw
HINGE JAMB



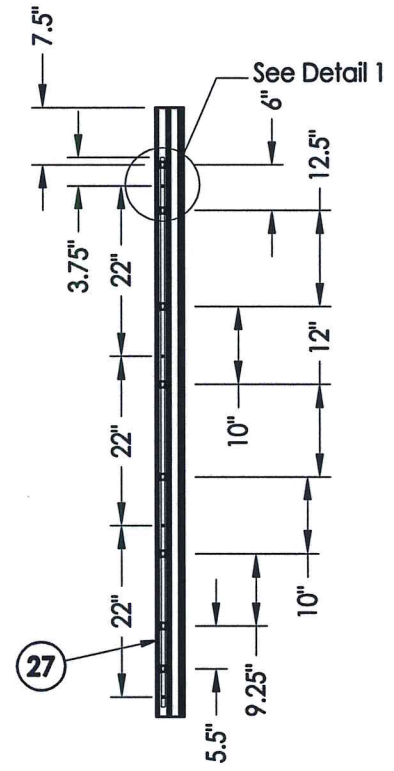
HINGE DETAIL



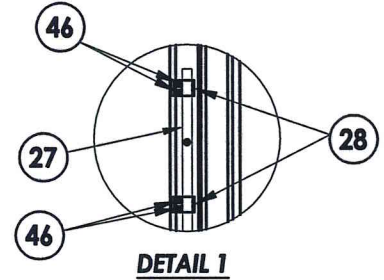
FRAME ANCHORING
 2X buck construction



SNUBBER DETAIL

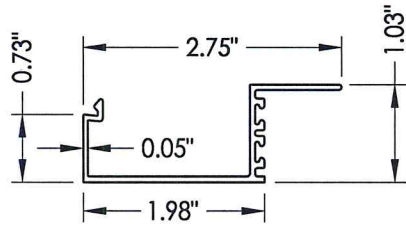


LOCK JAMB
 Locking Points (4)

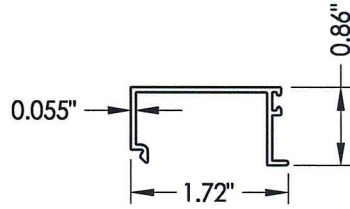


DETAIL 1

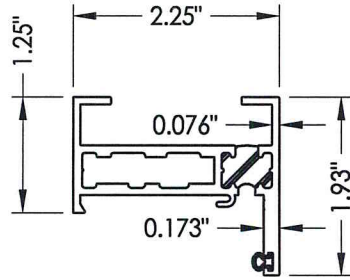
PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		FRAME ANCHORING	
NO.	DATE	REVISIONS	BY
DATE: 9/25/13			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7031A			
SHEET 3 OF 5			



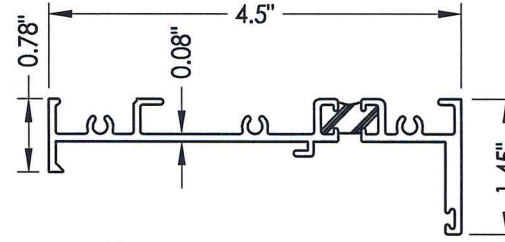
14 INSERT STOP
011448



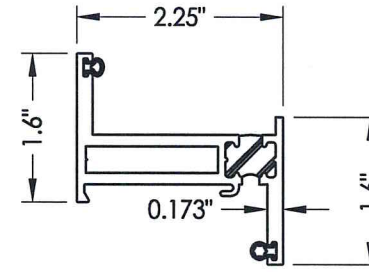
9 GLASS STOP 1/4"
006715



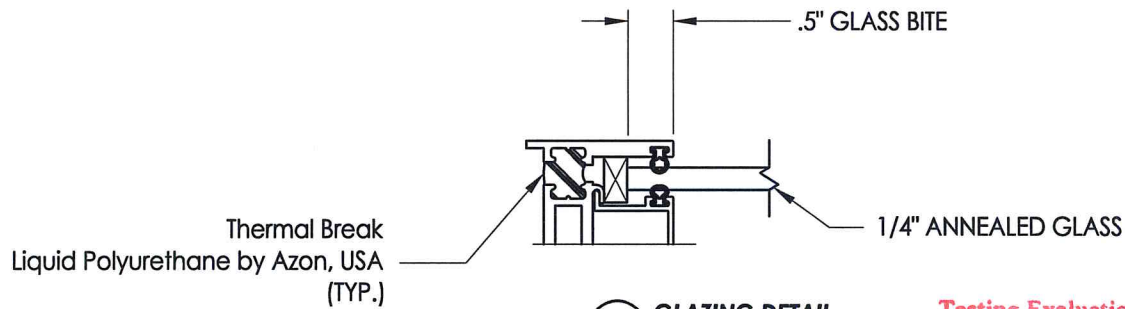
5 BLOCK FRAME
5278C1



2 KONA BLOCK FRAME
011239



7 ZEE BAR (PANEL)
H006733




1 GLAZING DETAIL

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 01990815
Date 10-31-13 Verified by *gju*

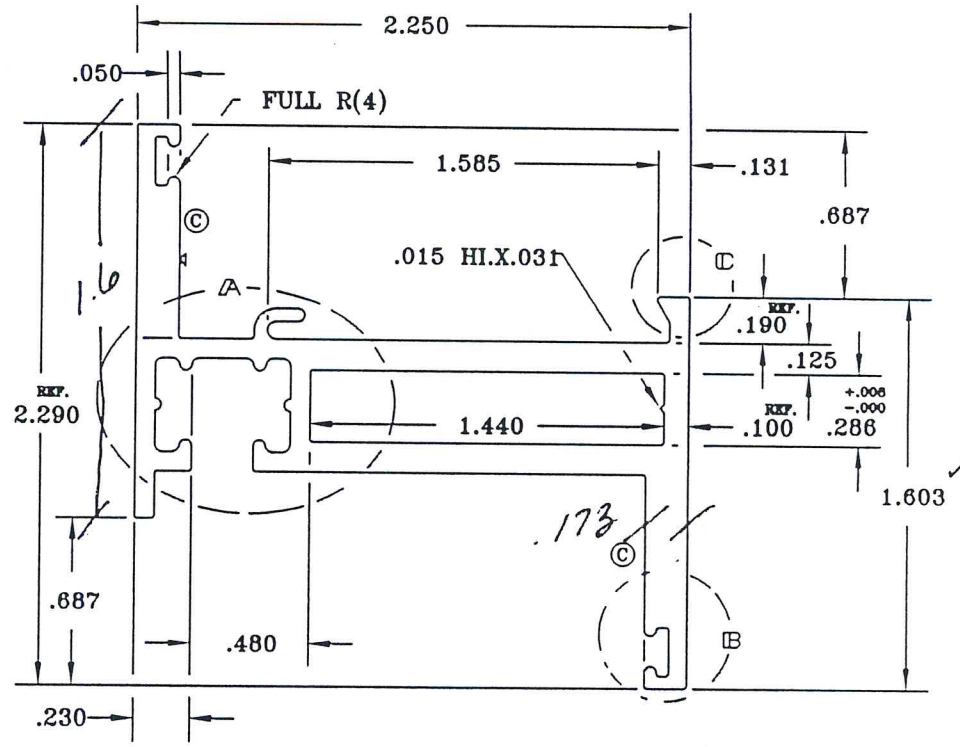
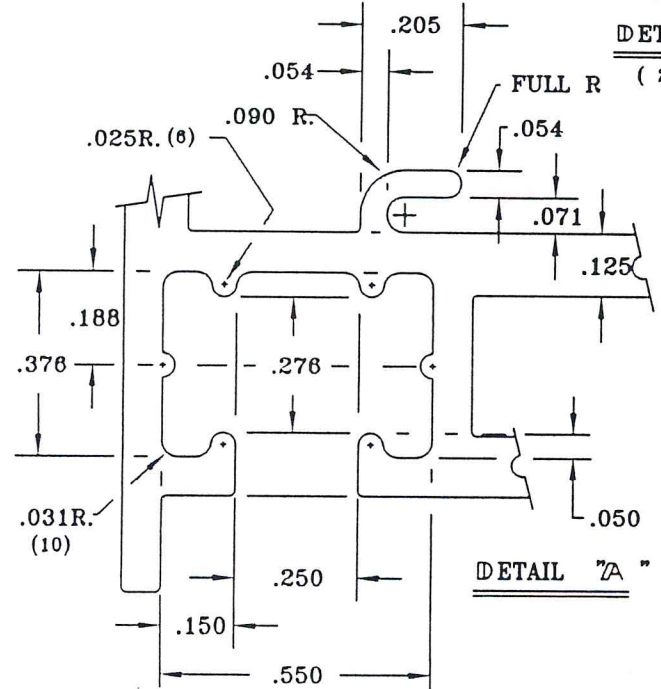
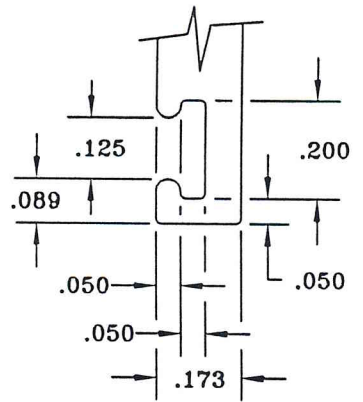
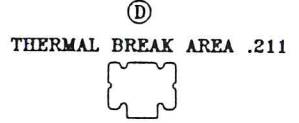
PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		COMPONENTS AND GLAZING DETAIL	
NO.	DATE	BY	REVISIONS
DATE: 9/25/13			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7031A			
SHEET 4 OF 5			

BILL OF MATERIALS		
ITEM #	DESCRIPTION	MATERIAL
B	2X BUCK SG >= 0.55	WOOD
C	1/4" MAX. SHIM SPACE	-
G	#10 x 2" PPH WOOD SCREW	STEEL
2	KONA BLOCK FRAME	6063-T6 ALUM
5	WESTWOOD BLOCK FRAME	6063-T6 ALUM
7	WESTWOOD ZEE BAR (PANEL)	6063-T6 ALUM
9	GLASS STOP (1/4")	6063-T6 ALUM
12	SHEAR BLOCK	ALUM
13	CORNER KEY	ALUM
14	INSERT STOP	ALUM
20	SS. BUTT HINGE	SS
22	SNUBBER-COMMERCIAL PULL-IN BLOCK	SS
23	MULTIPOINT LOCK HANDLE	SS
27	4 POINTS LOCKING BAR	SS
28	TIE BAR GUIDE	-
29	KEEPER	SS
30	CASEMENT ROTOR GEAR 13.5"	SS
35	CAM HANDLE / STRIKE PLATE	SS
36	CASEMENT SS. TRACK	SS
42	MACHINE SCREW NO 10-32, FHP .75"	STEEL
43	SCREW NO 10 , UFHP .5"	STEEL
44	SCREW NO 8, PHP, .50"	STEEL
46	SCREW NO 8, FHP, .750"	STEEL
47	MACHINE SCREW NO 10-32, PHP .5"	STEEL
48	BACK UP NUTS	STEEL
50	BULB VINYL (EPDM 70 DUROMETER)-TREMCO	-
51	MINI BULB VINYL(EPDM 70 DUROMETER)-TREMCO	-
52	WOOD BLOCK .750" X 1.250"	-
53	ALUMINUM BLOCK .750" X 1.250"	-
54	PVC BLOCK .750" X 1.250"	-
55	SETTING BLOCK	-
57	PIVOT SHIM	-

Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01990815
 Date 10-31-13 Verified by JK

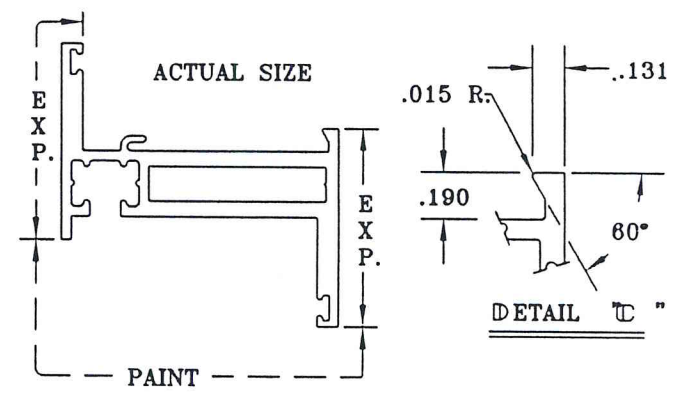
PRODUCT: FLEETWOOD KONA 3800 CASEMENT WINDOW											
PART OR ASSEMBLY: BILL OF MATERIALS											
		NO.		DATE		BY		REVISIONS			
											
DATE: 9/25/13											
SCALE: N.T.S.											
DWG. BY: JK											
CHK. BY: LFS											
DRAWING NO.: L-7031A											
SHEET 5 OF 5											

Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01990815
 Date 10-31-13 Verified by JW



∅.010 R. X .010 DEEP I.D. MARK NOTE: .080 TYP. WALL THICKNESS AS NOTED UNMARKED CORNERS .010 R.

CONFORMANCE	DES. REQ.	SPACER REQ.					
AREA .897	PORTS 1	DES. -					
WT/FT 1.076	V/P -	BOLSTER 1-2	D	ADD THERMAL BREAK AREA	TAS	8/21/06	
PERL 16.078	FLEE6042	DES. SIZE 9X5	C	REMOVED UNDERCUTS WT/FT. WAS .978, P18.433	ED	8/14/08	
DRW. BY <i>Kido</i>	DATE 3/14/03	MAT'L 6063-T6	B	REMOVED .186 STEP WT/FT. WAS 1.006, P18.418	ED	7/19/08	
CHD. BY	DATE	STANDARD TOLERANCES UNLESS OTHERWISE NOTED	LEV.	REVISION	BY	DATE	
 SIERRA ALUMINUM COMPANY 2345 Fleetwood Drive Riverside, California 92509 (909)781-7800 FAX (909)781-7864		FLEETWOOD ALUMINUM PRODUCTS, INC. PART NAME ZEE BAR		SCALE 3:1	PART NO. 05P11	DES. NO. H-006733	



Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01990815
 Date 10-31-13 Verified by JW

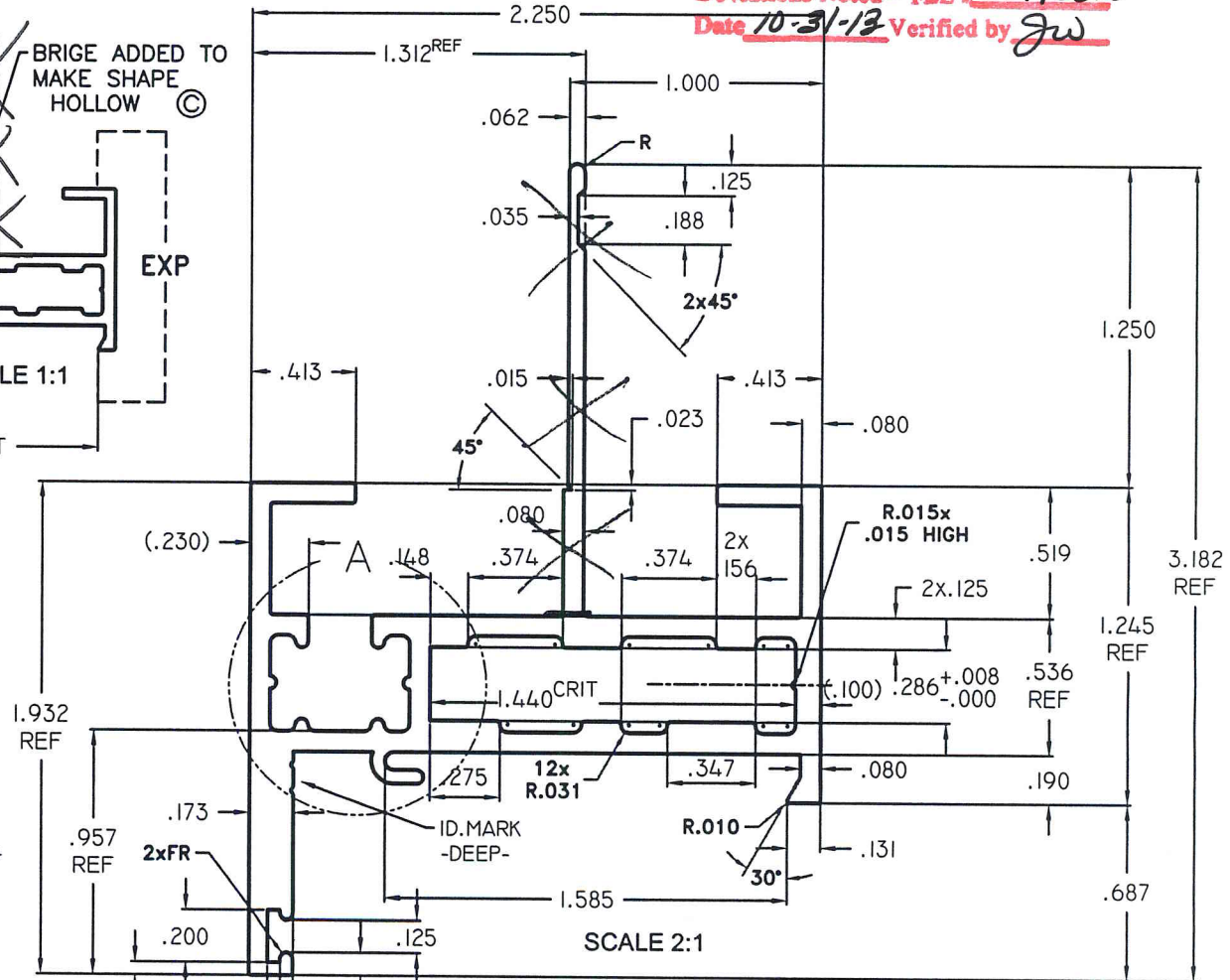
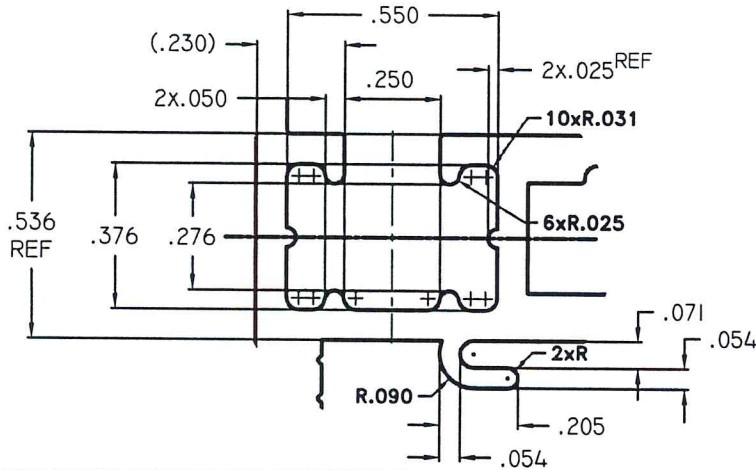
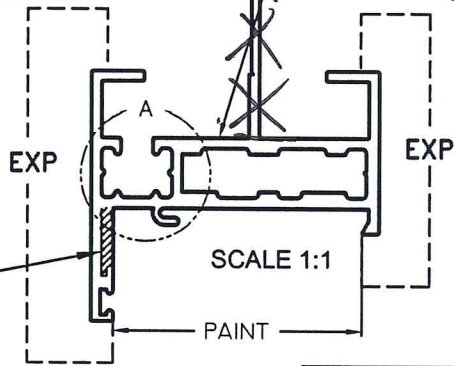
CUSTOMER: FLEETWOOD ALUMINUM PART NAME: 5000 INSIDE GLAZE PERIM. (NAIL-ON)
 PART NUMBER: 05P88

REV	REVISIONS	BY	DATE
A	MATERIAL ADDED-SEE ACTUAL SIZE	CD	3.11.03
B	SEE BELOW	CD	2.13.09
C	NOW A HOLLOW DIE/.413 WAS .625/R.031(12) WAS R.031(10)	CD	3.31.09
C1	REDRAWN	CD	4.8.09

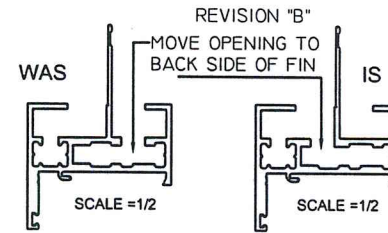
TB CAVITY TYPE CC
 AREA SQ" .210
 VOLUME CUBIC"/FT. 2.520

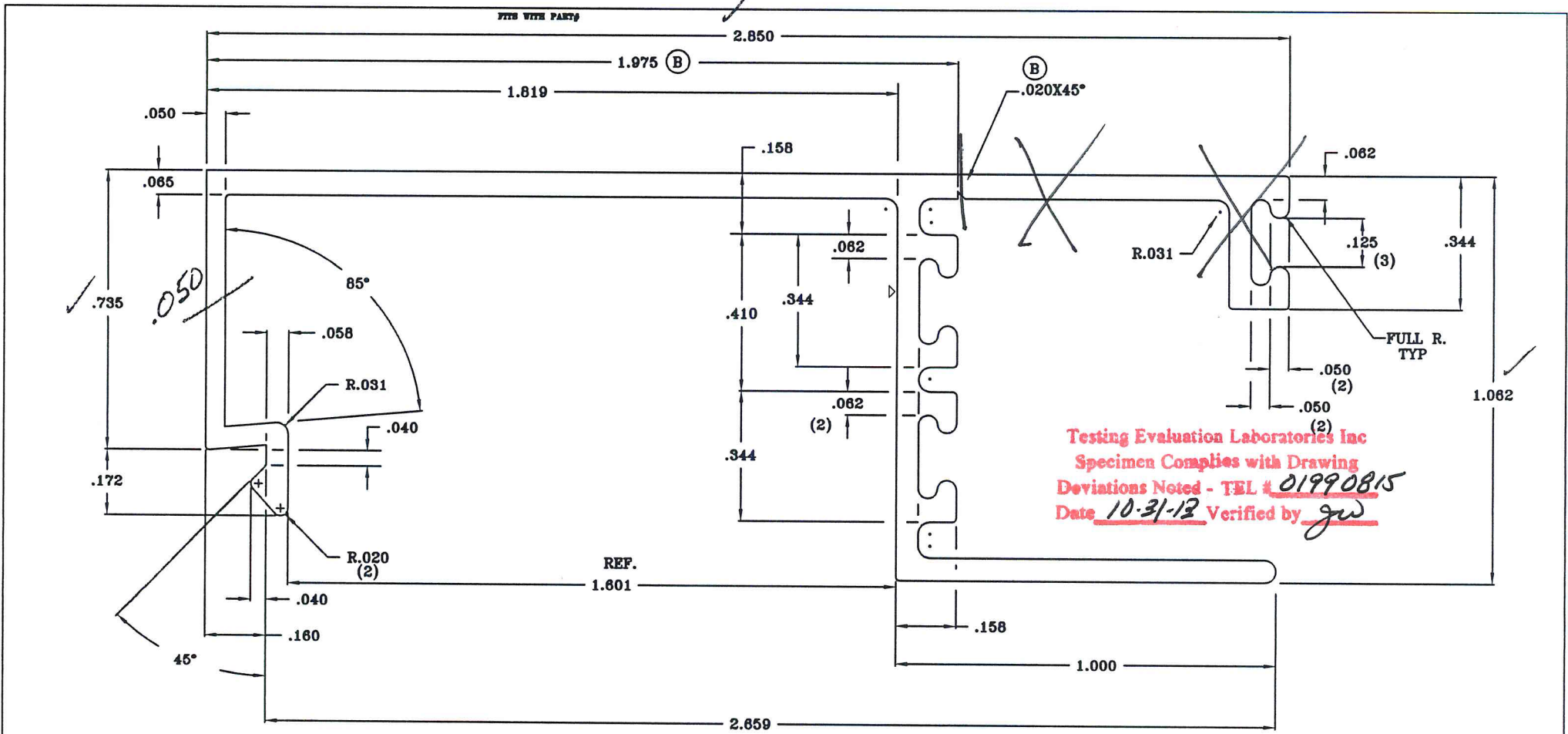
REVISION "A"
 MATERIAL ADDED

BRIGE ADDED TO
 MAKE SHAPE
 HOLLOW ©



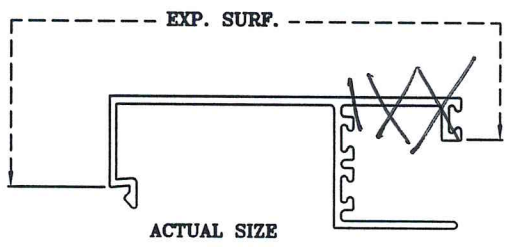
UNMARKED WALLS: .080	UNMARKED CORNERS: R.010	UNMARKED FILLETS: R.010
UNLESS OTHERWISE SPECIFIED, STANDARD ALUMINUM ASSOCIATION TOLERANCES APPLY • FRONTIER ID. MARK: TWO .010 R x .100 APART		
AREA .927	PRESS 4	DWN CD
WT/FT 1.113	PORTS 11x7-2H	DATE 4.17.2014
PERI. 21.012	W/P HOLLOW	D 5278
FACTOR 19	BKR. HOLLOW	CLASS HOLLOW
C.C.D. 3.57	BOL STD-2	17.205
AW: 020/92	RATIO: PRESS 1: PRESS 2: PRESS 3:	ALLOY & TEMPER 6063-T6
Frontier Aluminum Corp. 2480 Railroad St. Corona, Ca Ph: [951] 735-1770 Fax 735-1895 http://www.frontier-aluminum.com		DIE NO. 5278
		REV. C1



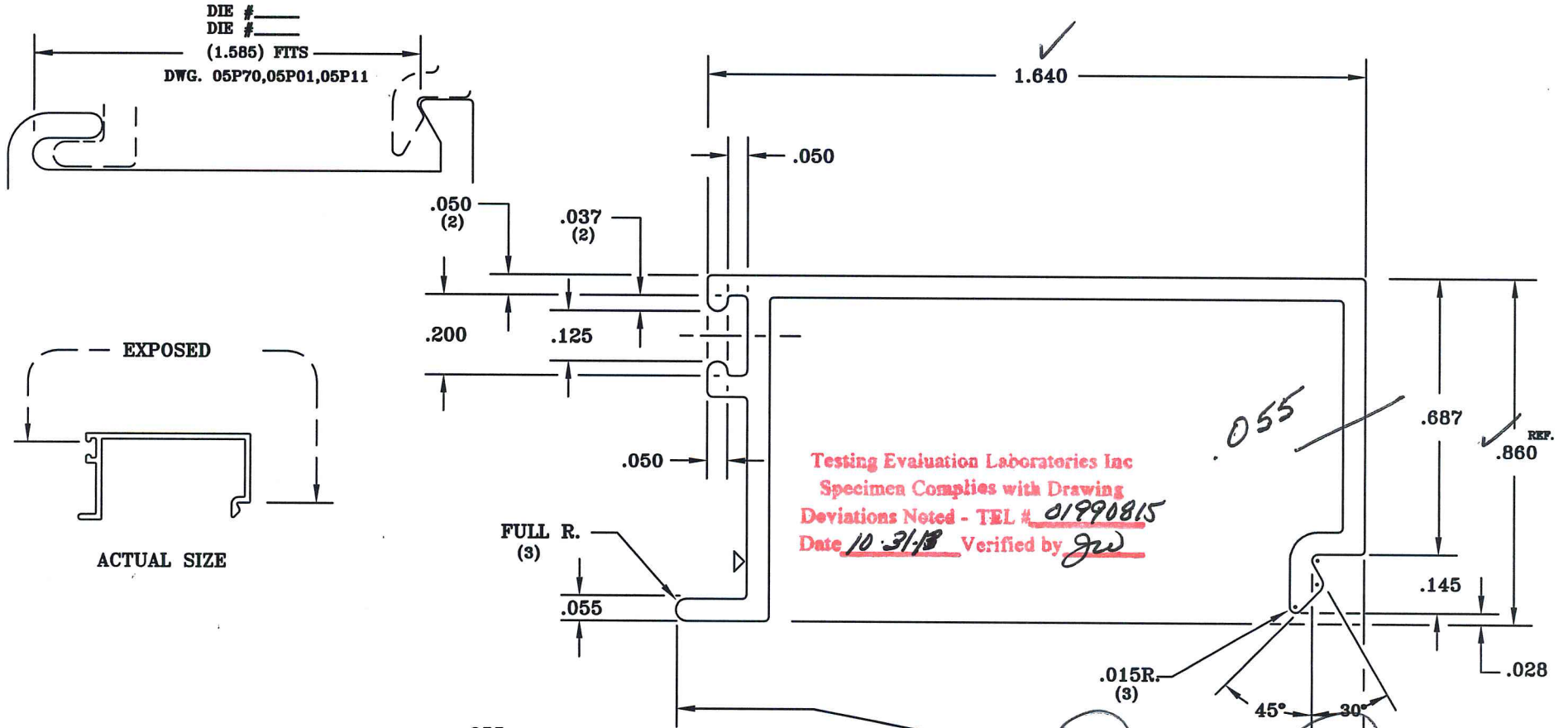


▷.010 R. X .010DEEPI.D. MARK NOTE: .058 TYP. WALL THICKNESS AS NOTED UNMARKED CORNERS .010 R.

CONTAINER	8	DR HING	5	SPACES HING	2				
AREA	.415	PORTS	3	DR	011448				
WT/PT	.496	V/P	POCKET	BOLSTER	3-6				
PERL	13.469	FLE	28807	DR SIZE	9X2				
DRN BY	KEN	DATE	4/24/02	MAT'L	6063-T6	D	RELOCATE .0002AP	ED	9/29/08
CHKD BY		DATE		STANDARD TOLERANCES UNLESS OTHERWISE NOTED		LET.	REVISION	BY	DATE
SIERRA ALUMINUM COMPANY		FLEETWOOD ALUMINUM		SCALE	4:1	PART NO.	3811		
2545 Fleetwood Drive Riverside, California 92509 (909)781-7800 FAX (909)781-7864		GLASS STOP		N/C		DR NO.	011448		



FITS WITH PARTS



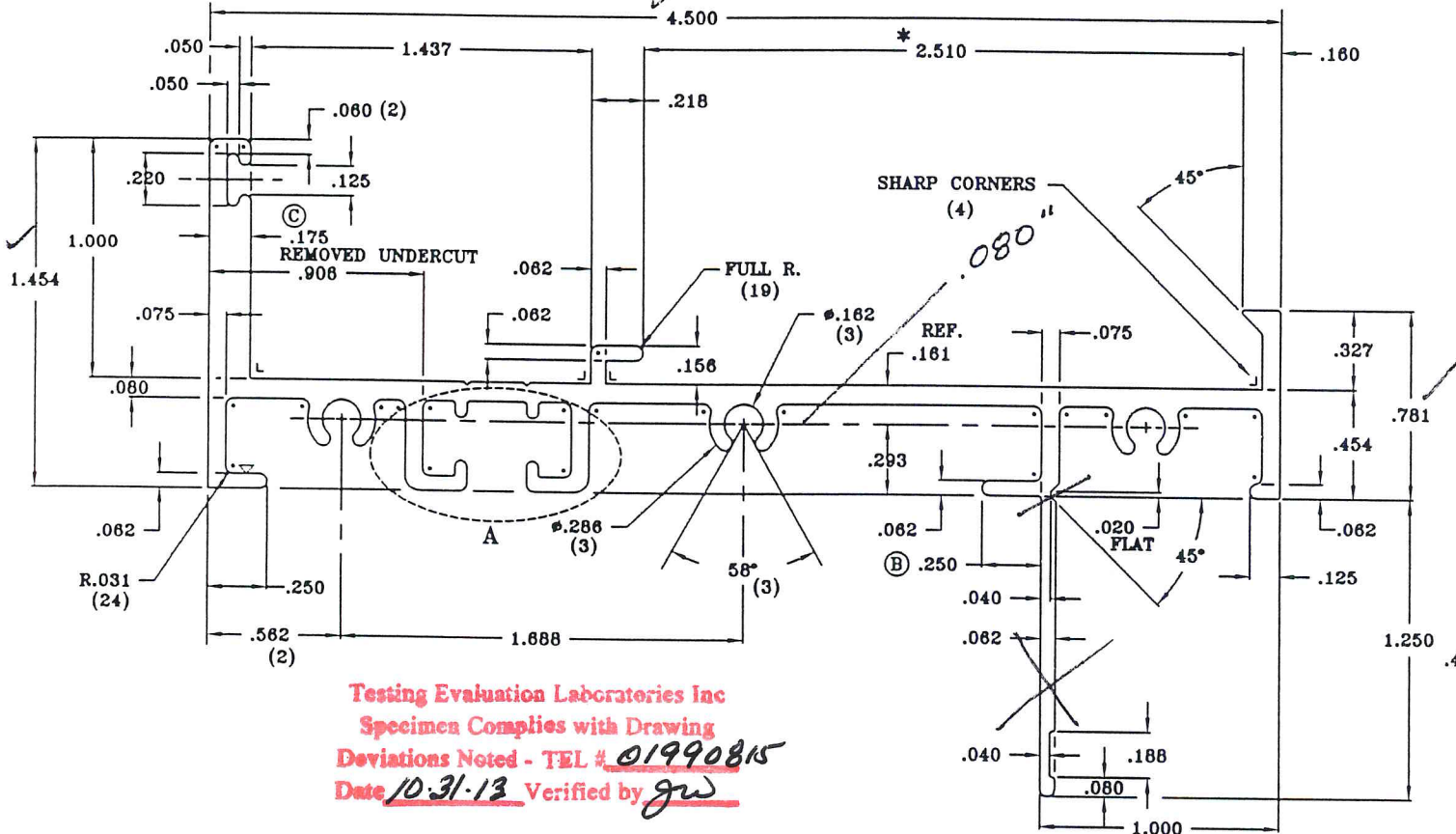
D.010 R. X .010DEEPLD. MARK

NOTE: .055 TYP. WALL HEIGHT AS NOTED UNMARKED CORNERS .010 R.

CONTAINER	DIE KING	SPACER KING					
AREA	.202	PORTS	4	EEK	3979		
WT/FT	.242	W/P	-	BOLSTER	4-9		
FEEL	7.339	FLEE	6045	DIE SIZE	9X1		
DWN. BY	KEN	DATE	6/09/92	MAT'L	6063-T6	B	MAT'L WAS 6063-T5 KO 10/09/00
CHKD. BY		DATE		STANDARD TOLERANCES UNLESS OTHERWISE NOTED		LET.	REVISION
SIERRA ALUMINUM COMPANY		CUSTOMER		SCALE		PART NO.	
2345 Fleetwood Drive		FLEETWOOD ALUM. PROD.		4:1		05P05	
Riverside, California 92509		PART NAME		-		DIE NO.	
(909)781-7800 FAX (909)781-7864		GLASS STOP 1/4"				006715	

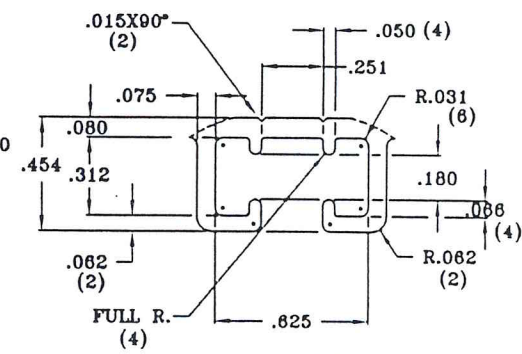
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FITS WITH PART# FLE 27177, FLE 27179, & FLE 27180

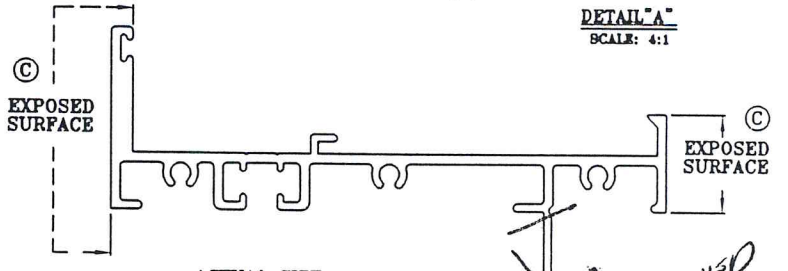


Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01990815
 Date 10-31-13 Verified by JW

THERMAL FILL AREA = .193 SQ. IN.



DETAIL "A"
SCALE: 4:1



• CRITICAL DIMENSION

D.010 R. X .010DEEPI.D. MARK NOTE: .075 TYP. WALL THICKNESS AS NOTED UNMARKED CORNERS .010 R.

CONTAINER	7/8	DEE RIDG	5	SPACE RIDG	2				
AREA	.921	POSTS	1	DEE	11238				
VT/VT	1.105	V/V POCKET		BOLSTER	11238	C	ADDED DIM. TO PART #11238	ED	11/18/08
FEEL	22.854	FLE 27176		DEE SIZE	9X2	C	REMOVED UNDERCUT VT/VT. WAS 1.087, P.23.087	ED	11/18/08
DWR. BY	KEN	DATE	11/12/03	MAT'L	6063-T6	B	ADDED MISSING DIM.	ED	7/29/01
CHEK. BY		DATE		STANDARD TOLERANCES UNLESS OTHERWISE NOTED		LIT.		BY	DATE
SIERRA ALUMINUM COMPANY		CUSTOMER		FLEETWOOD ALUMINUM		SCALE	2:1	PART NO.	
2345 Fleetwood Drive Riverside, California 92509 (909)781-7800 FAX (909)781-7864		PART NAME		4.500 FRAME BLOCK			930 N/C	DEE NO. 011239	