



# Testing Evaluation Laboratories, Inc.

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

**ASTM E 1886-05 / ASTM E 1996-06  
Missile Level “D” (Includes Wind Zone 4)**

## TEST REPORT SUMMARY

### Test Report Issued To:

**Fleetwood Windows and Doors  
1 Fleetwood Way  
Corona, CA 92879**

### WESTWOOD 250 Impact Resistant Aluminum Muller Awning Window

Title of Test	Results
	Specimen 8A 42.0 x 180.00
Impact	Pass
Fatigue Load Cycling	+65.0/- 65.0 psf

Reference should be made to Report No. TEL 01991061 for complete test specimen description and data. For corresponding data regarding AAMA/WDMA/CSA 101/I.S./2/A440-08 reference should be made to Report No. TEL 01991060. *For additional impact specimens, please see test report No.. TEL 01990818.*

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

## TEST RESULTS

IAS Laboratory Certification No: TL-299

Report No: TEL 01991061

Test Dates: September 23-27, 2013

Report Date: June 19, 2014

### Issued to:

Fleetwood Windows and Doors  
1 Fleetwood Way  
Corona, CA 92879

**Project Summary:** Testing Evaluation Laboratories, Inc. (TEL) was contracted by Fleetwood Windows and Doors to perform tests on the Westwood 250 Casement and Awning Windows at TEL's Plant City, FL test facility. *For additional impact specimens, please see test report No. TEL 01990818.*

Test specimen descriptions and results are reported herein.

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

ASTM E 1886-05 / ASTM E 1996-06  
Missile Level "D" (Includes Wind Zone 4)

### Test Specimen Description:

**Series / Model:** Westwood 250 Casement and Awning Windows

**Type:** Aluminum Muller Awning Windows - (O/X/O)

**Overall Size:** 42.00" x 180.00" – Specimen 8a - (O/X/O)

**Daylight Opening:** 39.062" x 9.312" – Specimen 8a - Top Fixed Panel (O)  
33.13" x 76.062" – Specimen 8a - Center Active Panel (X)  
39.062" x 81.625" – Specimen 8a - Bottom Fixed Panel (O)

**Glazing Detail:** See attached drawings 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 numbers L-7171.

# IMPACT AND CYCLING TESTS

## Specimen 8A – 42.0" x 180.0" Aluminum Stacked Fixed/Awning/Fixed Window – (O/X/O)

### ASTM E1886-05/ASTM E1996-06 – Large Missile Impact (2 x 4 Southern Yellow Pine)

Cond. Temp Of Specimen	Missile Level	Missile Weight	Missile Length	Muzzle Distance From Specimen
76°F	D	9.0 lbs, 3 oz	8'-0"	17'0"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	32.00"	11.00"	49.9 fps
2	Pass	21.00"	43.00"	49.7 fps
3	Pass	21.00"	84.00"	49.9 fps
4	Pass	32.00"	94.00"	50.0 fps
5	Pass	21.00"	126.00"	49.8 fps

Orientation of Missile at Impact was within +/-5° of horizontal.  
None of the impacts penetrated the specimens.  
"X" measurement is from the left edge of test specimen.  
"Y" measurement is from the bottom edge of test specimen.

### ASTM E1886-05/ASTM E1996-06– Fatigue Load Cycling Design Pressure +65.0 psf / -65.0 psf

Positive % of Test Load	Positive Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
20% to 50%	13.0 to 32.5	3500	2.93
0% to 60%	0.0 to 39.0	300	2.81
50% to 80%	32.5 to 52.0	600	1.75
30% to 100%*	19.5 to 65.0	100	2.65

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.81
50% to 80%	32.5 to 52.0	1050	1.65
0% to 60%	0.0 to 39.0	50	2.10
20% to 50%	13.0 to 32.5	3350	2.28

\*Panel deflected 2.25" from original plane at 100% Positive load and 2.75" from original plane at 100% Negative load. At the completion of cycles the door panel was operable. There were no tears in the film. In our opinion, the tape and film used to seal for air leakage did not influence the results of the test.

Jarrett Wright and James Hayhurst, Test Technicians

Mfg Observers – Joe Zammit

## 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, sub-contractors, 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.

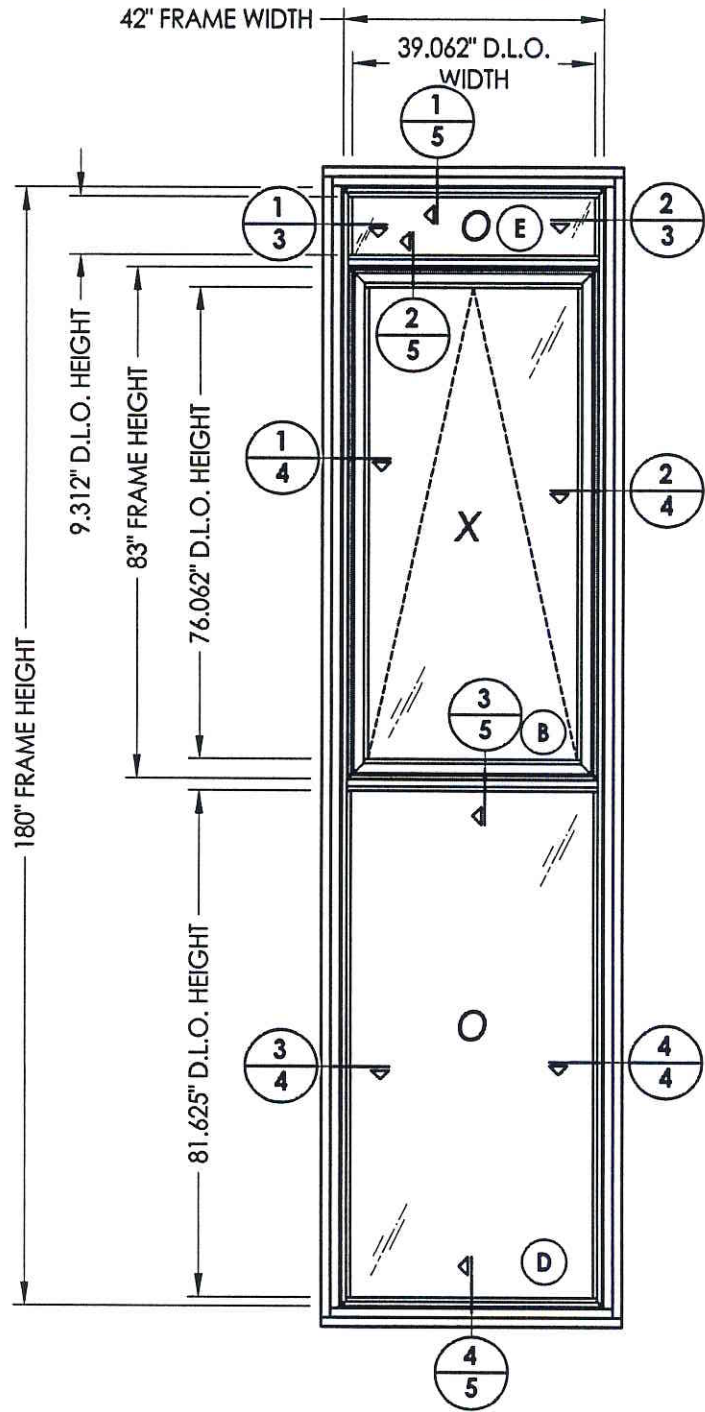


Vivian K. Wright,  
President

**Revision Log**

Rev No.	Date	Page(s)	Revision(s)
0	6/19/2014	NA	Original Report Issue



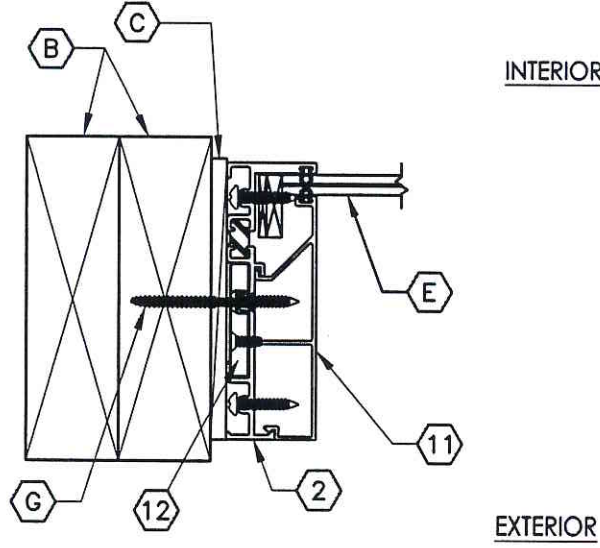


SPEC. #8, 8A

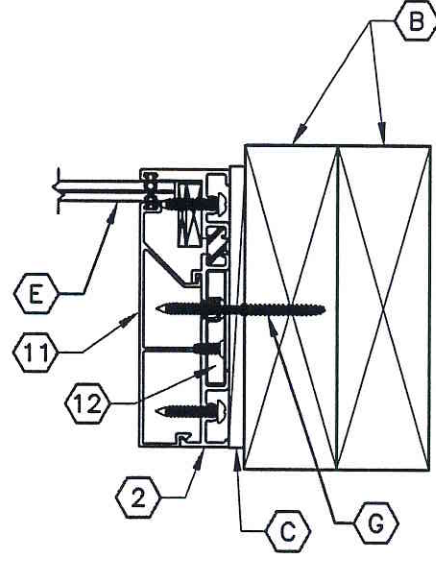
Testing Evaluation Laboratories Inc  
 Specimen Complies with Drawing  
 Deviations Noted - TEL # 019991061  
 Date 6/19/14 Verified by *bllee*

PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		TEST ELEVATION	
NO.	DATE	BY	REVISIONS
DATE: 6/19/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7171			
SHEET 2 OF 9			

**1**  
**3** HORIZONTAL CROSS SECTION



**2**  
**3** HORIZONTAL CROSS SECTION



Testing Evaluation Laboratories Inc  
 Specimen Complies with Drawing  
 Deviations Noted TEL # 0199.1061  
 Date 6/19/14 verified by WJL

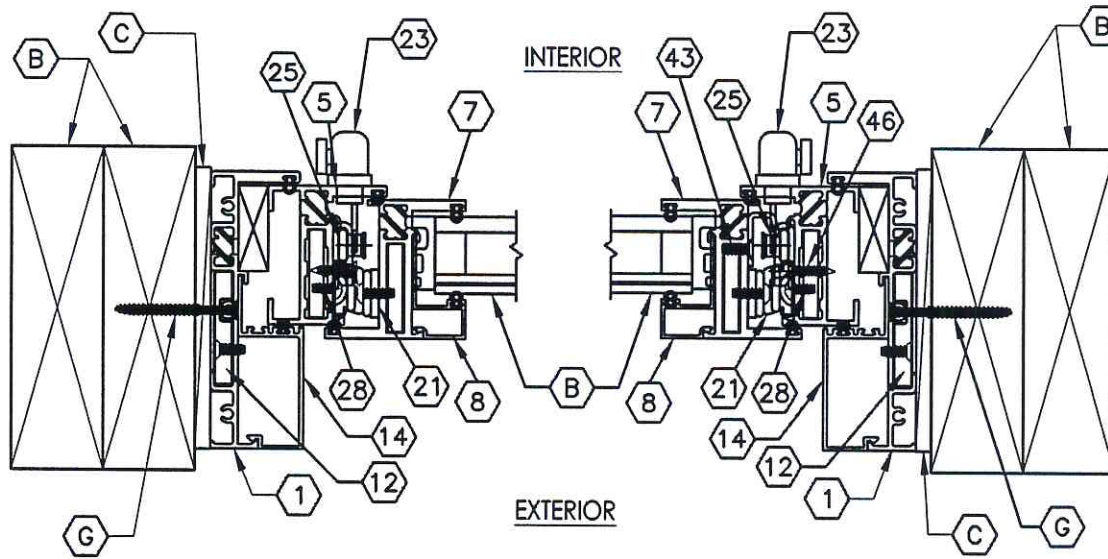
**RW** BUILDING  
 CONSULTANTS, INC.  
 813.659.9197

DATE: 6/19/14  
 SCALE: N.T.S.  
 DWG. BY: JK  
 CHK. BY: LFS  
 DRAWING NO.:  
 L-7171  
 SHEET 3 OF 9

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NO.	DATE	REVISIONS	BY

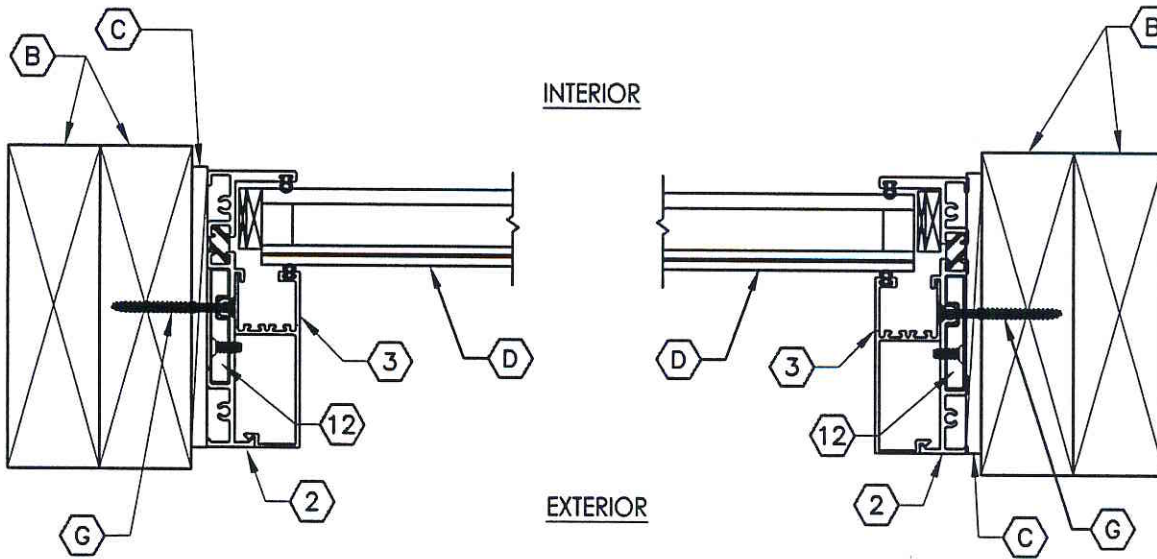


Testing Evaluation Laboratories Inc  
 Specimen Complies with Drawing  
 Deviations Noted TEL: 01991961  
 Date 6/19/14 verified by *WLU*



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4 **HORIZONTAL CROSS SECTION**

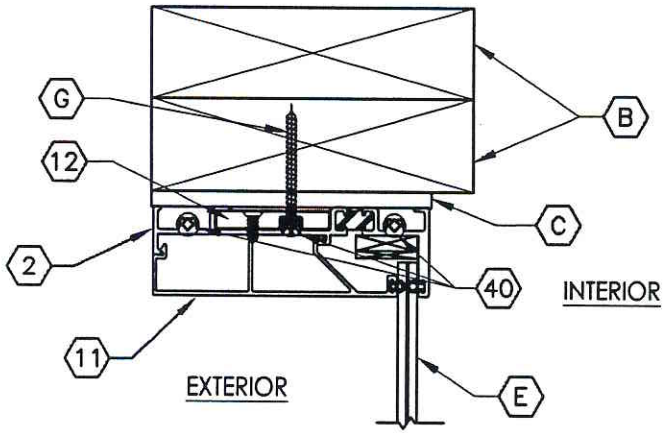


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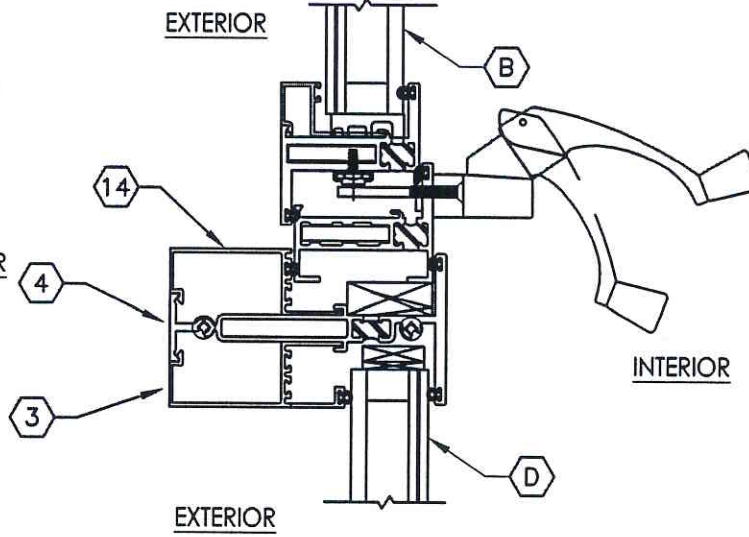
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PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		HORIZONTAL CROSS SECTIONS	
NO.	DATE	BY	REVISIONS
 RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE: 6/19/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.:			
L-7171			
SHEET 4 OF 9			

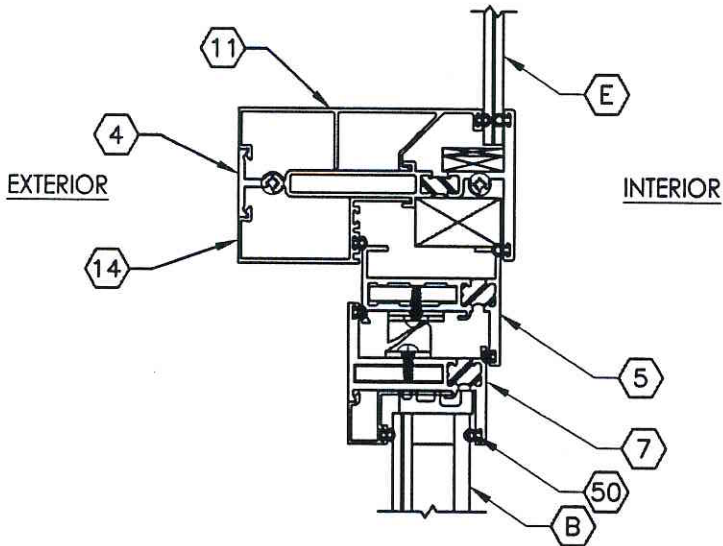
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 Deviations Noted - TEL # 0199 1061  
 Date 6/19/14 Verified by *elka*



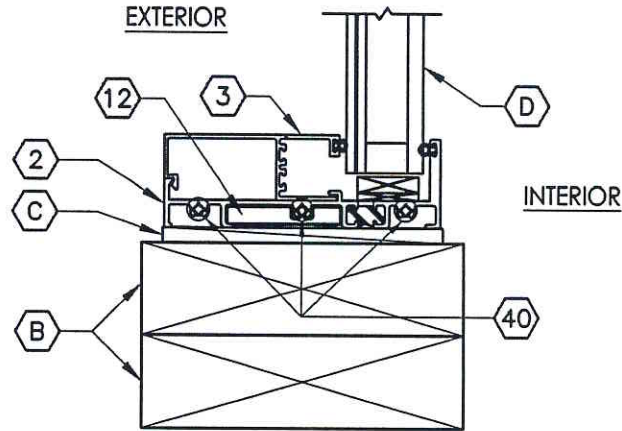
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5 VERTICAL CROSS SECTION



3  
5 VERTICAL CROSS SECTION

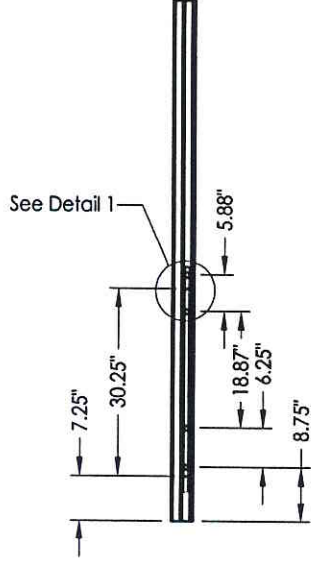
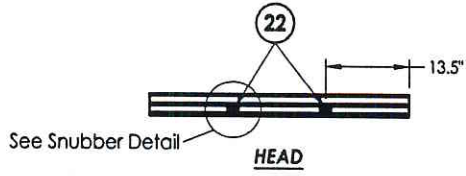


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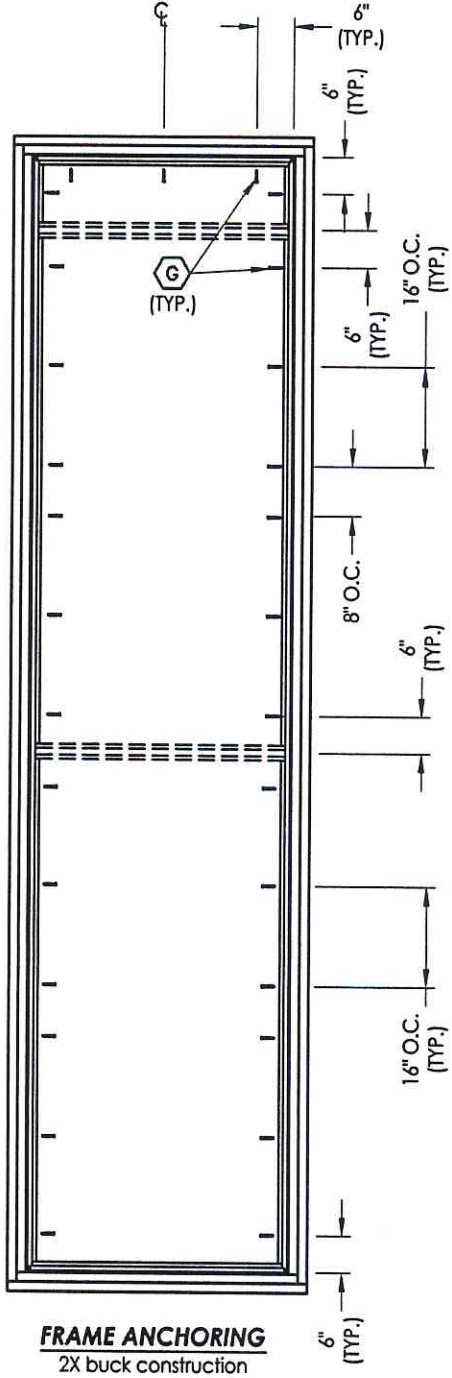
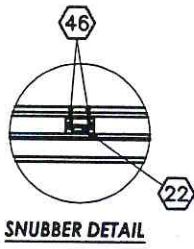


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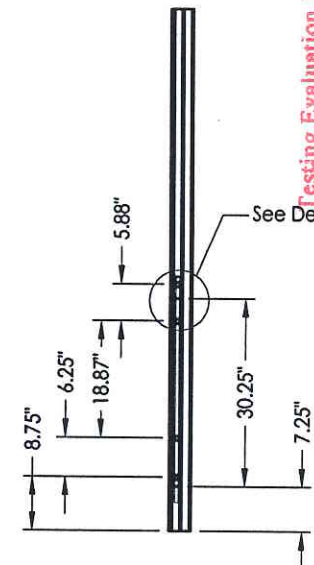
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		NO.	DATE
			BY
			REVISIONS
 RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE: 6/19/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7171			
SHEET 5 OF 9			



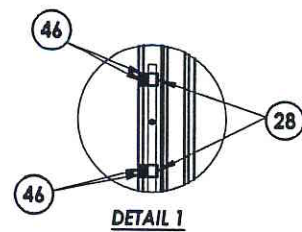
**LOCK JAMB**  
Two Point Lock  
(Casement)



**FRAME ANCHORING**  
2X buck construction

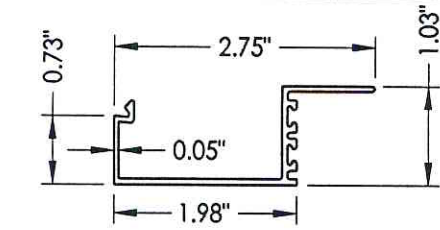


**LOCK JAMB**  
Two Point Lock  
(Casement)

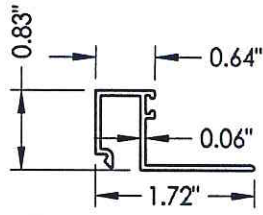


Testing Evaluation Laboratories Inc  
Specimen Complies with Drawing  
Deviations Noted - TEL # 01991061  
Date 6/19/14 Verified by *WJL*

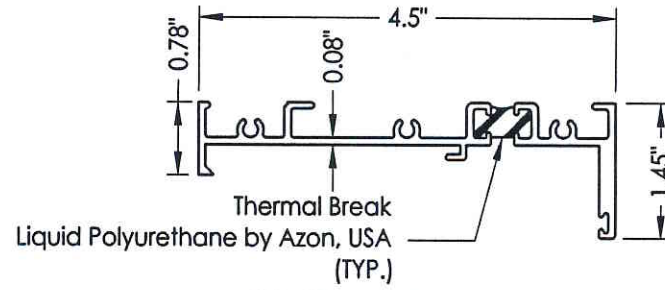
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<b>PART OR ASSEMBLY:</b>		FRAME ANCHORING	
		REVISIONS	
		NO.	DATE
			BY
 <b>RW BUILDING CONSULTANTS, INC.</b> 813.659.9197			
DATE: 6/19/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7171			
SHEET 6 OF 9			



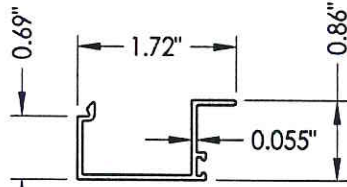
**14 INSERT STOP**  
011448



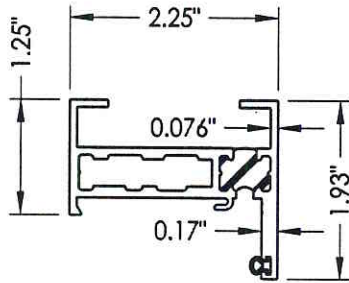
**8 GLASS STOP 1 1/4"**  
901487



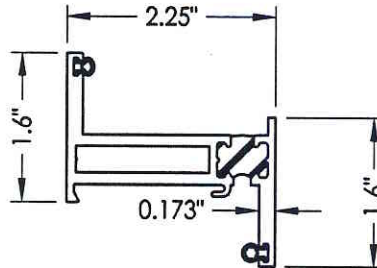
**2 KONA BLOCK FRAME**  
011239



**10 GLASS STOP 5/16"**  
007930

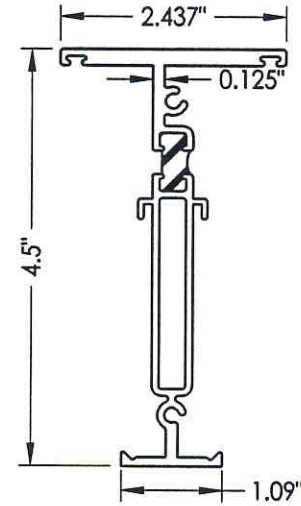


**5 BLOCK FRAME**  
5278C1

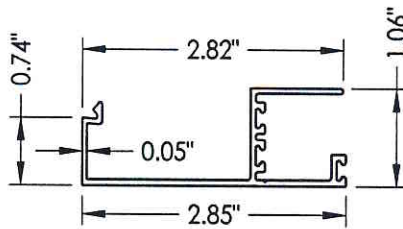


**7 ZEE BAR (PANEL)**  
H006733

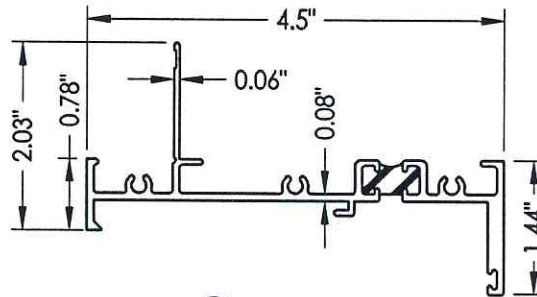
Testing Evaluation Laboratories Inc  
Specimen Complies with Drawing  
Deviations Noted - TEL # 0199 10101  
Date 6/19/14 Verified by *[Signature]*



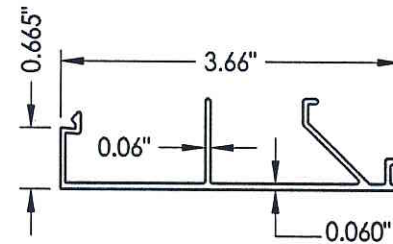
**4 MULLION**  
H011241



**3 GLASS STOP 1-1/4"**  
011448



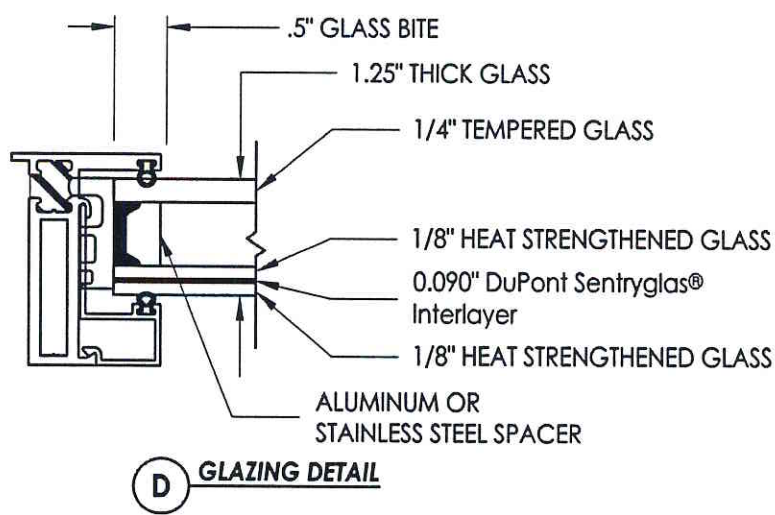
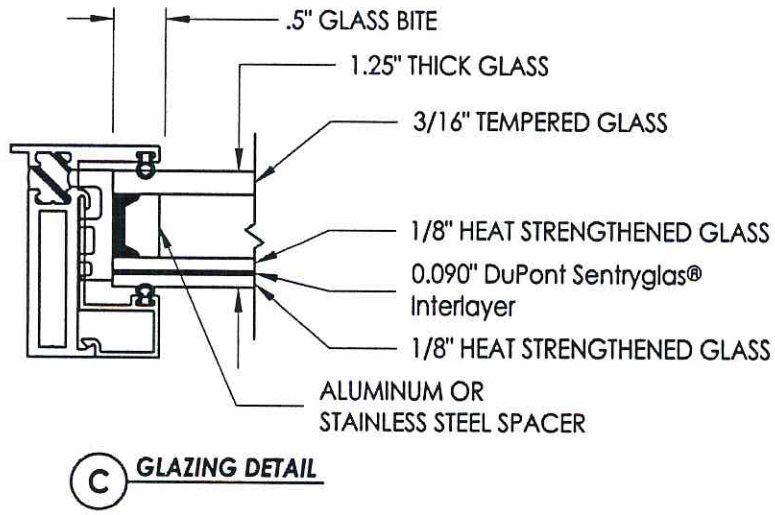
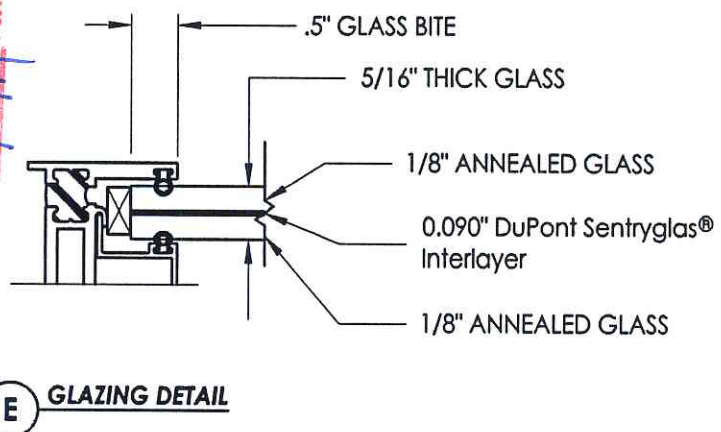
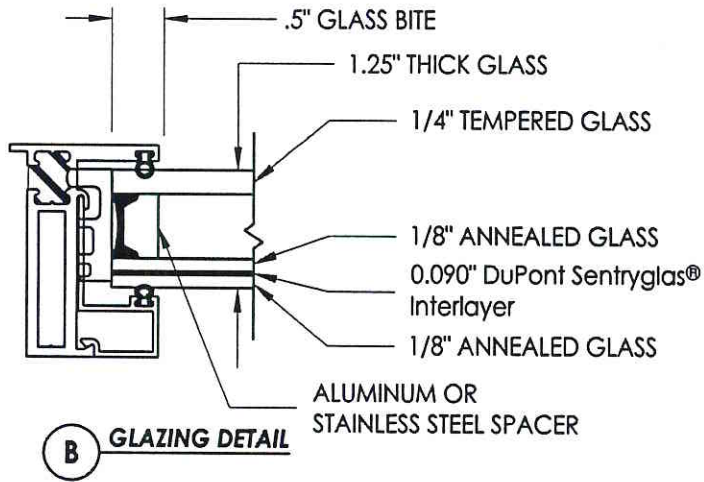
**1 KONA FIN FRAME**  
011239



**11 GLASS STOP 5/16"**  
011243

PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		COMPONENTS	
NO.	DATE	REVISIONS	BY
DATE: 6/19/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7171			
SHEET 7 OF 9			

Testing Evaluation Laboratories Inc  
 Specimen Complies with Drawing  
 Deviations Noted - TEL. # 61991061  
 Date 6/19/14 Verified by *[Signature]*



PRODUCT:		FLEETWOOD KONA 3800 CASEMENT WINDOW	
PART OR ASSEMBLY:		GLAZING DETAILS	
NO.	DATE	REVISIONS	BY
RW BUILDING CONSULTANTS, INC. 813.659.9197			
DATE: 6/19/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7171			
SHEET 8 OF 9			

