



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

Kona 3800 Awning Window

Title of Test	Results
Impact	65.0 x 42.0
Fatigue Load Cycling	+65.0/- 65.0 psf

Reference should be made to Report No. TEL 01991029 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 01991028.

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

Dade Lab Certification Number: 11-1213.01
Test Notification Number: TEL 13-005

Report No: TEL 01991029
Test Dates: April 17, 2014
Report Date: April 30, 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 Kona 3800 Casement and Awning Windows at TEL's Plant City, FL test facility.

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: Kona 3800 Casement and Awning Windows
Type: Aluminum Awning Window
Overall Size: 65.00" x 42.00" – (X)
Daylight Opening: 56.63" x 33.88" – (X)
Glazing Detail: See attached drawing numbers L-7033A 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-7033A.

SEQUENCE OF TESTS PERFORMED:

STRUCTURAL TESTS

Specimen 1 – 65.0" x 42.0" Aluminum Awning Window (X)

Design Pressure Positive 65.0 Negative 65.0

Air Infiltration (ASTM E283-04) (See Report #TEL 01990817 for these results.)

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)
Half Test Positive	30	32.50
Design Positive	30	65.00
Half Test Negative	30	32.50
Design Negative	30	65.00

Water Infiltration (ASTM E331-00) (See Report #TEL 01990817 for these results.)

Structural Loads (ASTM E330-02)

Range	Time (sec)	Load (psf)	Location	Deflection	Set	Allowable (Set)
Half Proof Positive	10	48.75				
Test Positive	30	97.50	1	0.004"	0.000"	0.228"
Half Proof Negative	10	48.75				
Test Negative	30	97.50	1	0.013"	0.004"	0.228"

Deflection Locations:

Location 1 – Center of cam lock.

Forced Entry (See Report #TEL 01990817 for these results.)

Conclusion: TEL observed no signs of failure in any area of this test specimen during the Uniform Static Load Test. In addition, specimen met the permanent set requirements. Therefore, this specimen satisfies the uniform static load test requirements of ASTM E330-02.

James Hayhurst, Test Technicians

IMPACT AND CYCLING TESTS (TAS 201/203)

Specimen 1A – 42.0" x 84.0" Aluminum Casement Window – (X)

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, 2 oz	8'-0"	17'1"

Impact Location	Results	X - Measurement	Y - Measurement	Speed
1	Pass	32.0"	21.0"	49.6 fps
2	Pass	56.0"	11.0"	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	1.66
0% to 60%	0.0 to 39.0	300	2.06
50% to 80%	32.5 to 52.0	600	1.60
30% to 100%*	19.5 to 65.0	100	2.20

Negative % of Test Load	Negative Pressure Range (psf)	Number Of Cycles	Average Cycle Time (Sec)
30% to 100%*	19.5 to 65.0	50	2.29
50% to 80%	32.5 to 52.0	1050	2.00
0% to 60%	0.0 to 39.0	50	2.24
20% to 50%	13.0 to 32.5	3350	1.37

*Panel deflected 1.88" from original plane at 100% Positive load and 1.75" 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.

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.

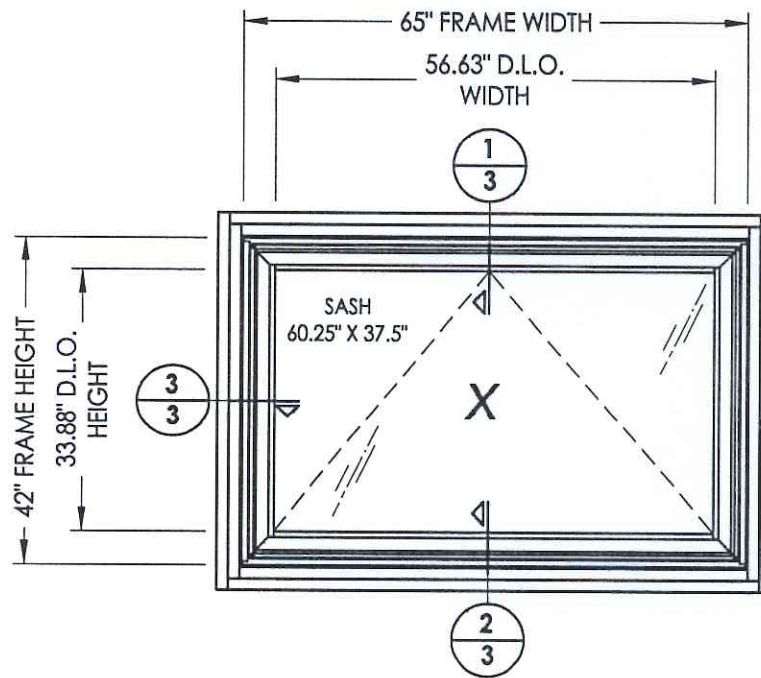
Testing Evaluation Laboratories, Inc.



Vivian K. Wright,
President

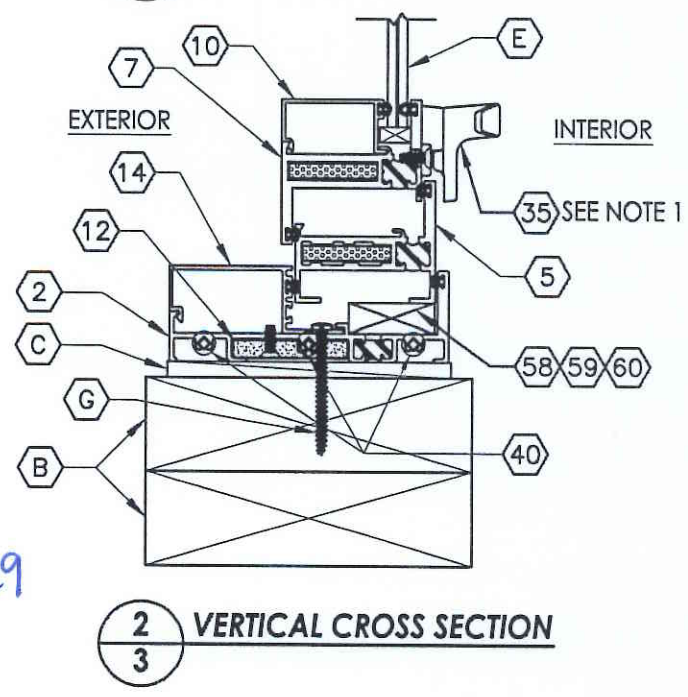
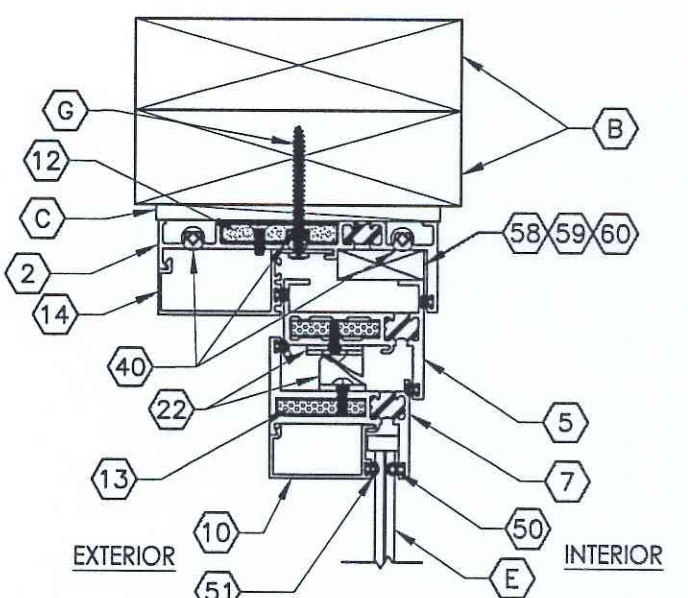
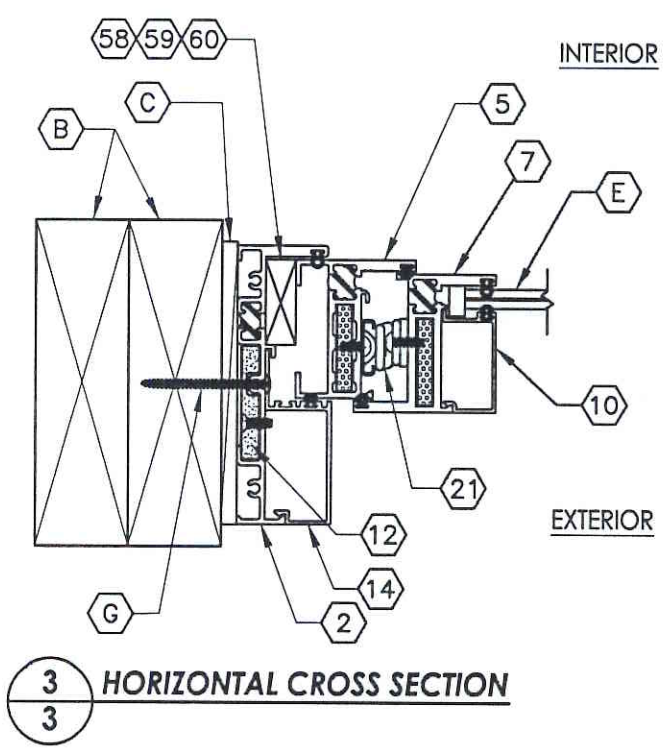
Revision Log

Rev No.	Date	Page(s)	Revision(s)
0	4/30/2014	NA	Original Report Issue



Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted TEL # 01991029
 Date 4/30/14 Verified by [Signature]

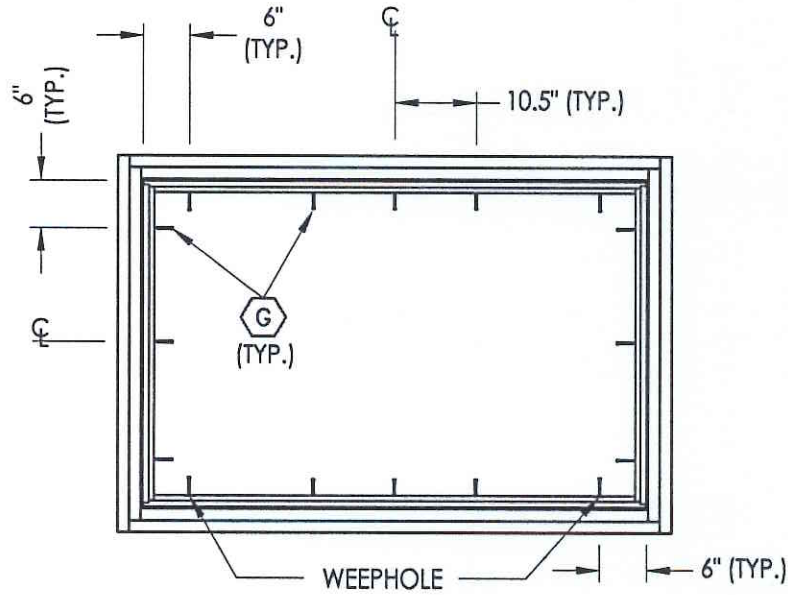
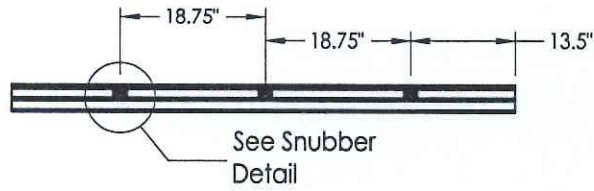
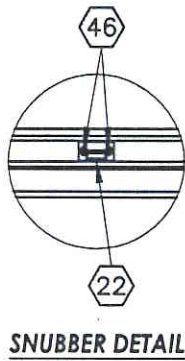
PRODUCT: FLEETWOOD KONA 3800 AWNING WINDOW		PART OR ASSEMBLY: TEST ELEVATION	
NO.	DATE	REVISIONS	BY
DATE: 4/23/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7033A			
SHEET 2 OF 6			



NOTE:
1. Item #35 located 17"
from each end (2) total.

Testing Evaluation Laboratories Inc
Specimen Complies with Drawing
Deviations Noted - TEL # 0199 1029
Date 4/30/14 Verified by RW

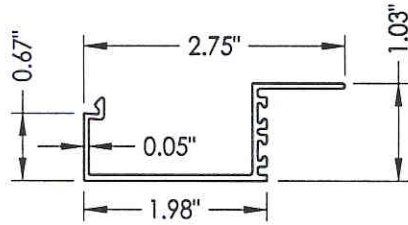
PRODUCT: FLEETWOOD KONA 3800 AWNING WINDOW		PART OR ASSEMBLY: HORIZONTAL AND VERTICAL CROSS SECTIONS	
NO.	DATE	BY	REVISIONS
DATE: 4/23/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7033A			
SHEET 3 OF 6			



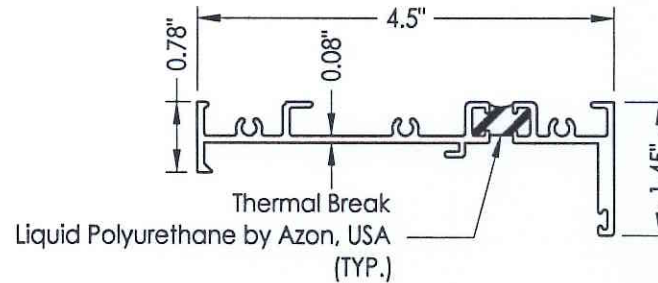
FRAME ANCHORING
2X buck construction

Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 0199 1129
 Date 4/30/14 Verified by [Signature]

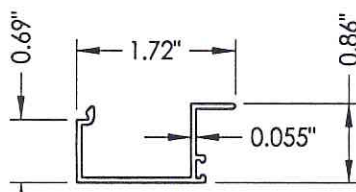
PRODUCT: FLEETWOOD KONA 3800 AWNING WINDOW		PART OR ASSEMBLY: FRAME ANCHORING	
NO.	DATE	REVISIONS	BY
DATE: 4/23/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7033A			
SHEET 4 OF 6			



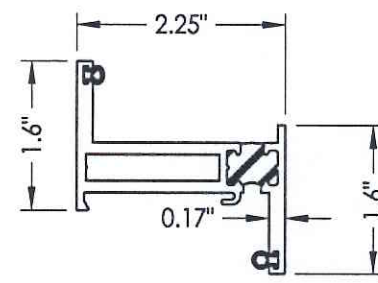
14 INSERT STOP



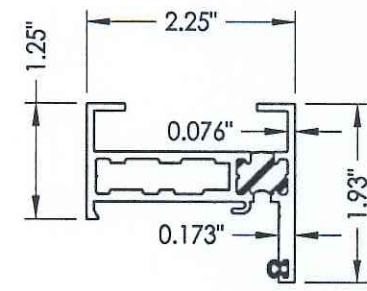
2 KONA BLOCK FRAME



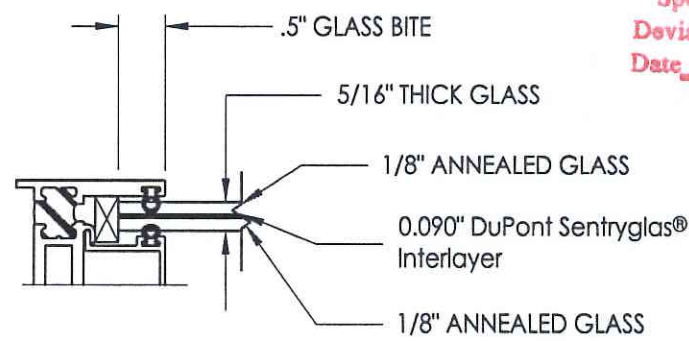
10 GLASS STOP 5/16", 7/16"



7 ZEE BAR (PANEL)



5 BLOCK FRAME




E GLAZING DETAIL

Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01991029
 Date 4/30/14 Verified by [Signature]

PRODUCT:		FLEETWOOD KONA 3800 AWNING WINDOW	
PART OR ASSEMBLY:		COMPONENTS	
NO.	DATE	BY	REVISIONS
DATE: 4/23/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.: L-7033A			
SHEET 5 OF 6			

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
10	GLASS STOP (5/16", 7/16")	6063-T6 ALUM
12	SHEAR BLOCK	ALUM
13	CORNER KEY	ALUM
14	INSERT STOP	6063-T6 ALUM
21	4 BAR HINGE	SS
22	SNUBBER-COMMERCIAL PULL-IN BLOCK	SS
35	CAM HANDLE / STRIKE PLATE	SS
40	#10 X 1" PPH SMS	STEEL
46	SCREW NO 8, FHP, .750"	STEEL
50	BULB VINYL (EPDM 70 DUROMETER)-TREMCO	-
51	MINI BULB VINYL(EPDM 70 DUROMETER)-TREMCO	-
58	WOOD BLOCK .50" X 1.250"	-
59	ALUMINUM BLOCK .50" X 1.250"	-
60	PVC BLOCK .50" X 1.250"	-
61	SETTING BLOCK 4" x 1/8" x 1"	-

Testing Evaluation Laboratories Inc
 Specimen Complies with Drawing
 Deviations Noted - TEL # 01991029
 Date 4/30/14 Verified by [Signature]

PRODUCT: FLEETWOOD KONA 3800 AWNING WINDOW		PART OR ASSEMBLY: BILL OF MATERIALS	
			BY
			REVISIONS
		NO.	DATE
			
DATE: 4/23/14			
SCALE: N.T.S.			
DWG. BY: JK			
CHK. BY: LFS			
DRAWING NO.:			
L-7033A			
SHEET 6 OF 6			