Architectural Testing

AAMA/WDMA/CSA 101/I.S.2/A440-05
TEST REPORT

Rendered to:

FLEETWOOD WINDOWS AND DOORS

SERIES/MODEL: Kona 3800 Intersecting TDL
PRODUCT TYPE: Fixed Window

Title	Summary of Results
Primary Product Designator	FW-C50 3048 x 3048 (120 x 120)
Design Pressure	±2400 Pa (±50.13 psf)
Air Infiltration @ 300 Pa (6.27 psf)	<0.05 L/s/m^2 (<0.01 cfm/ft^2)
Air Infiltration @ 75 Pa (1.57 psf)	<0.05 L/s/m^2 (<0.01 cfm/ft^2)
Water Penetration Resistance Test Pressure ASTM E 331	580 Pa (12.11 psf)
Water Penetration Resistance Test Pressure ASTM E 547	580 Pa (12.11 psf)
Uniform Load Structural Test Pressure	±3600 Pa (±75.19 psf)
Forced Entry Resistance	ASTM F 588 CAWM

Test Completion Date: 11/03/09

Reference must be made to Report No. 94551.02-301-44, dated 08/10/10 for complete test specimen description and data.

2524 E. Jensen Ave
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Architectural Testing

AAMA/WDMA/CSA 101/I.S.2/A440-05 TEST REPORT

Rendered to:

FLEETWOOD WINDOWS AND DOORS
395 Smitty Way
Corona, California 92879

Report No.:	94551.02-301-44
Test Dates:	10/01/09
Through:	11/03/09
Report Date:	01/25/10
Revision 3 Date:	08/10/10
Record Retention End Date:	11/03/13

Project Summary: Architectural Testing, Inc. was contracted by Fleetwood Windows and Doors to perform and validate testing on a Series/Model Kona 3800 Intersecting TDL fixed window. The sample tested successfully met the performance requirements for a FW-C50 3048 x 3048 (120 x 120) rating. Test specimen description and results are reported herein. The sample was provided by the client.

Test Specification: The test specimen was evaluated in accordance with the following

AAMA/WDMA/CSA 101/I.S.2/A440-05, *Standard/Specification for Windows, Doors, and Unit Skylights.*

CAWM 301, *Forced Entry Resistance Tests for Windows.*

Test Specimen Description:

Series/Model: Kona 3800 Intersecting TDL

Product Type: Fixed

Overall Size: 3048 mm (120") wide by 3048 mm (120") high

Daylight Opening Size x 4: 1454 mm (57-1/4") wide by 1454 mm (57-1/4")

Overall Area: 9.29 m^2 (100.00 ft^2)

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Test Specimen Description: (Continued)

Finish: Anodized Aluminum

Frame Construction: All members were constructed of extruded aluminum. The vertical frame members corners were routed to fit the horizontal framing members and fully sealed with silicone. The frame corners were attached using three (3) #10 1" long stainless steel Phillips head screws. The vertical frame member dividing each lite was attached with two (2) #10 1" long stainless steel Phillips head screws. All frame members were thermally broken.

Weatherstripping: No weatherstripping was utilized.

Glazing Details: The specimen utilized 1" thick annealed glass units fabricated from two 3/16" thick annealed sheets and a 5/8" thick airspace. The glass was set from the exterior against a vinyl bulb gasket and Tremco silicone at the interior. An aluminum glazing stop and a vinyl bulb gasket was applied from the exterior. The glass bite was 1/2".

Drainage:

Description	Quantity	Location
1/2" by 1/4" weep slots	4	6" from all corners in the sill and horizontal mullion face
2" by 1/2" weep slots	4	6" from all sill and horizontal mullion corners in the glazing stop leg
1" weep notch	4	6" from corners in center leg of sill and horizontal mullion

Hardware: No hardware was utilized.

Reinforcement: No reinforcement was utilized.

Installation: The test specimen was installed into a two layer nominal 2 x 8 Douglas Fir test buck. Thirty-two (32) #10 x 2" wood screws were located in all perimeter frame members located 6" from each corner and 16" on center. The rough opening was 1/4" wider and taller than the specimen.

Test Results: The temperature during testing was 21°C (70°F). The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.2.1	Air Leakage Resistance per ASTM E 283		
	75 Pa (1.57 psf)	<0.05 L/s/m^2 (<0.01 cfm/ft^2)	1.5 L/s/m^2 (0.3 cfm/ft^2) max.
	300 Pa (6.27 psf)	<0.05 L/s/m^2 (<0.01 cfm/ft^2)	1.5 L/s/m^2 (0.3 cfm/ft^2) max.

***Note #1**: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-05 for air leakage resistance.*

5.3.3.2 Water Penetration Resistance per ASTM E 547 and E 331 See Note #2

***Note #2**: The client opted to start at a pressure higher than the minimum required. Those results are listed under "Optional Performance".*

5.3.4.2 Uniform Load Deflection per ASTM E 330 See Note #2

5.3.4.3 Uniform Load Structural per ASTM E 330 See Note #2

5.3.5 Forced Entry Resistance per ASTM F 588

Type: D	Grade: 10	
Disassembly Test	No entry	No entry
Lock Hardware Manipulation Test	No entry	No entry
Forced Entry Resistance per CAWM		
Type: V		
Disassembly Test	No entry	No entry
Test A	No entry	No entry
Test B	No entry	No entry

Test Results: (Continued)

Paragraph	Title of Test - Test Method	Results	Allowed
	Optional Performance		
4.4.2.6	Water Penetration Resistance per ASTM E 547 and E 331		
	580 Pa (12.11 psf)	No leakage	No leakage
4.4.2.6	Uniform Load Deflection per ASTM E 330		
	(Deflections were taken on the vertical member)		
	(Loads were held for 10 seconds)		
	2400 Pa (50.13 psf) (positive)	29.5 mm (1.16")	See Note #3
	2400 Pa (50.13 psf) (negative)	40.8 mm (1.61")	See Note #3

***Note #3**: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-05 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

4.4.2.6	Uniform Load Structural per ASTM E 330		
	(Permanent sets were taken on the vertical member)		
	(Loads were held for 10 seconds)		
	3600 Pa (75.19 psf) (positive)	4.8 mm (0.19")	9.1 mm (0.36") max.
	3600 Pa (75.19 psf) (negative)	4.0 mm (0.16")	9.1 mm (0.36") max.

Tape and film were not used to seal against air leakage during structural testing.

Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen reported herein.

List of Official Observers:

Name	Company
Nathan Baker	Fleetwood Window and Doors
Tyler Westerling, P.E.	Architectural Testing, Inc.
Dennis Janzen	Architectural Testing, Inc.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen can be made. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Digitally Signed by: Tyler Westerling
Tyler Westerling, P.E.
Project Engineer

Digitally Signed by:Leaton Kirk
Leaton Kirk
Director – Regional Operations

TW:ss

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Alteration Addendum (1)
- Appendix-B: Test Equipment (1)
- Appendix-C: Photographs (1)
- Appendix-D: Drawings (3)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	01/25/10	N/A	Original report issue
1	02/22/10	2	Updated glazing description to non-laminated
2	03/01/10	Cover, 1	Changed Curtainwall to fixed window
3	08/10/10	Cover	Changed reference report date

Appendix A

Alteration Addendum

Alteration #1: Date-11/03/09
Cause for alteration- Failed Uniform Load per ASTM E 330
Remedial action taken- Intersection key strengthened

Appendix B

Test Equipment

Instrument	Manufacturer	Asset #
Spray rack	ATI	Mockup
Control Panel	ATI	005062
Linear Transducer	Celesco	005218
Linear Transducer	Celesco	004486
Linear Transducer	Celesco	003428

Appendix C
Photographs

Photo No. 1
Water Penetration Test

Photo No. 2
Structural Load Test

Appendix D

Drawings

TABLE OF CONTENTS

GENERAL NOTES

1. THESE SYSTEMS HAVE BEEN TESTED, ANALYZED AND APPROVED FOR DESIGN PRESSURES NOT TO EXCEED THOSE SHOWN IN THE "ALLOWABLE DESIGN LOAD" TABLE.

2. BUCKING OPENINGS & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER LOADS TO THE STRUCTURE AND TO BE REVIEWED BY BUILDING OFFICIAL.

3. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & MAY NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS.

4. THE DETAILS & SPECIFICATIONS SHOWN HEREIN REPRESENT THE PRODUCTS TESTED & PROPOSED FOR WATER, AIR, IMPACT, CYCLIC & UNIFORM STATIC AIR PRESSURE TESTING IN CONFORMANCE WITH AAMA AND FBC PROTOCOLS TAS 201, 202 & 203 FOR LARGE MISSILE IMPACT AND ASTM 1886/1998.

5. THESE SYSTEMS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE (FBC) INCLUDING HIGH VELOCITY HURRICANE ZONES (HVHZ).

6. ALL ANCHORS SHALL BE INSTALLED AS SPECIFIED ON THESE DRAWINGS. SPECIFIED EMBEDMENT TO BASE MATERIAL SHALL BE BEYOND WALL FINISH OR STUCCO.

7. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL MEET THE REQUIREMENTS OF AAMA AND FLORIDA BUILDING CODE.

GLAZING TYPES	ASTM 1886/1998 TAS 201, 202,203 LARGE MISSILE IMPACT AND CYCLIC WIND LOADING
GA: 1": (5MM–ANNEALED, 0.625 AIR, 5MM–ANNEALED.	NO
GA: 1–1/4" INSULATING LAMINATED GLASS COMPRISED OF: 5MM TEMPERED– 5/8" AIRSPACE – 5MM HEAT STRENGTHENED – 90 MIL SENTRY GLASS® – 5MM HEAT STRENGTHENED	YES

ALLOWABLE DESIGN LOAD			
MAXIMUM DESIGN PRESSURE:		+50 PSF	-50 PSF
MAXIMUM FRAME SIZE WITH TDL BARS:	120" X 120"		
MAXIMUM FRAME SIZE WITHOUT TDL BARS:	120" X 60"		
MAXIMUM TDL BAR LENGTH:	120"		
	GLAZING DAYLIGHT OPENING		
MAXIMUM GLAZING SIZE	120" X 60"		
WITH NON–INTERSECTING TDL BARS	120" X 60"		
WITH INTERSECTING TDL BARS	60" X 60"		

*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. 10 SMS SCREW	FULL	3/8"
CMU/CONCRETE	(2)3/16" CONCRETE SCREWS	1 1/4"	2 5/8"

(1)SMS SCREWS GRADE 5
(2)CONCRETE SCREWS SHALL BE 3/16" ITW TAPCON OR EQUIVALENT

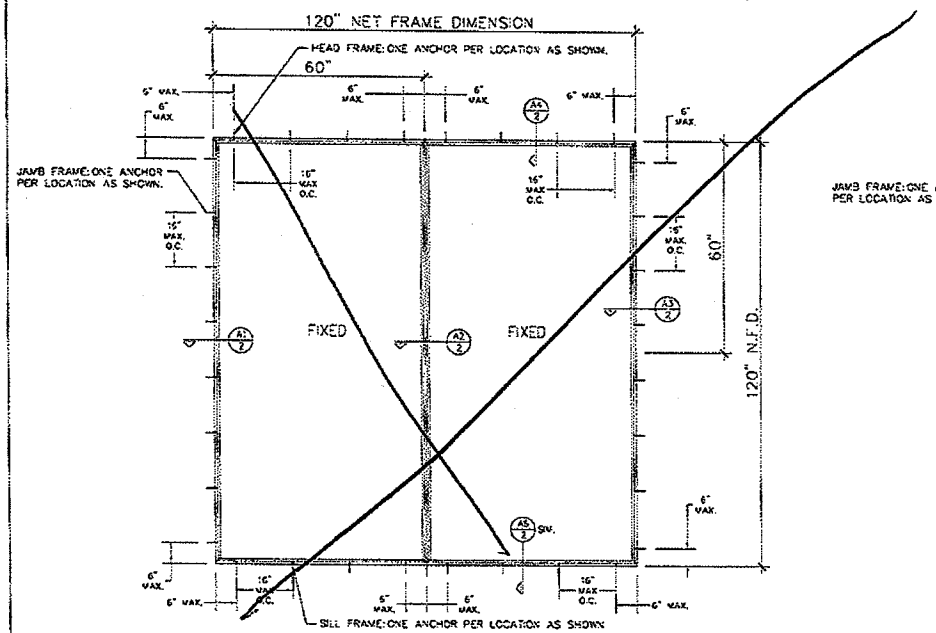
Architectural Testing, Inc.
Test sample complies with these details
Deviations are noted

9455

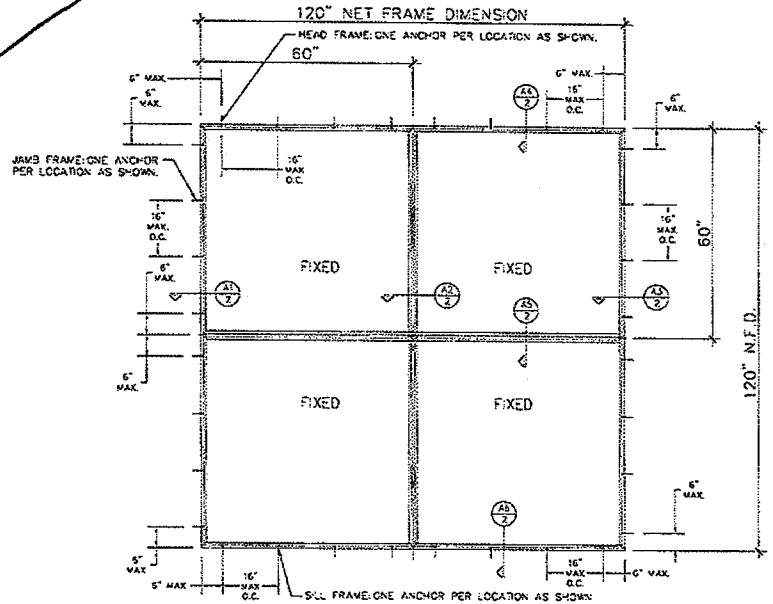
JAN 05 2010

Report# Date

Tech



SPECIMEN 1: VERTICAL TDL



SPECIMEN 2: INTERSECTING TDL

VALIDATOR INITIAL

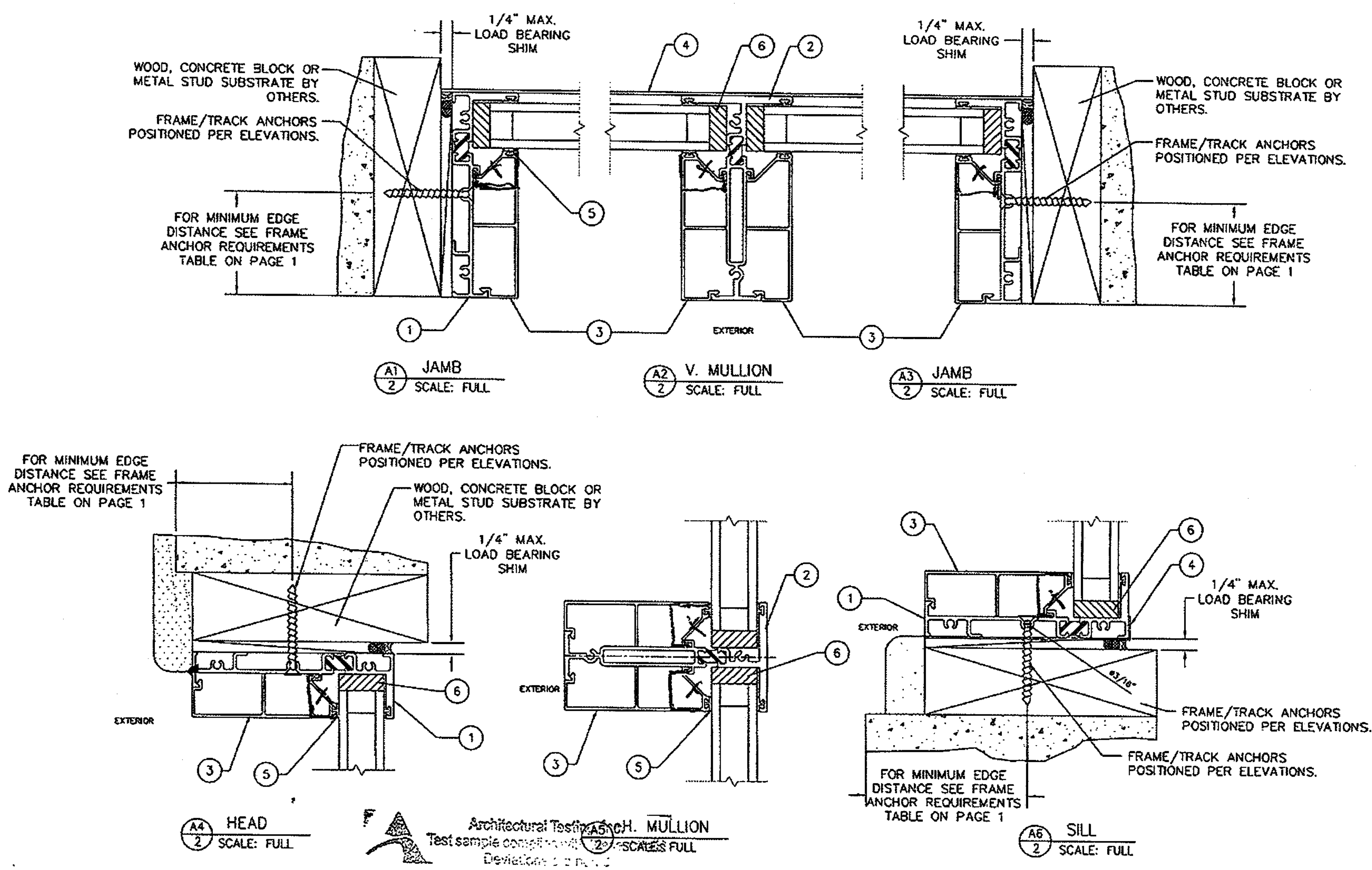
REVISIONS	DATE	DRAWN BY	TITLE	COMMENTS
	09/17/2009	KEVIN	KONA 3800 AAMA, FBC, ASTM 1886/1998 CERTIFICATION CUSTOM FLEETWOOD WINDOWS AND DOORS KONA 3300 CERTIFICATION	JOB NUMBER: 263893

FLEETWOOD WINDOWS AND DOORS
385 SVETTY AVE CORONA, CALIFORNIA 92880 - www.fleetwoodusa.com

SCALE : 1:16

DRAWING NO. : CERT-3800 - 09

SHEET : 1 OF 3



Architectural Testing Inc.
Test sample compl...
Deviations ...

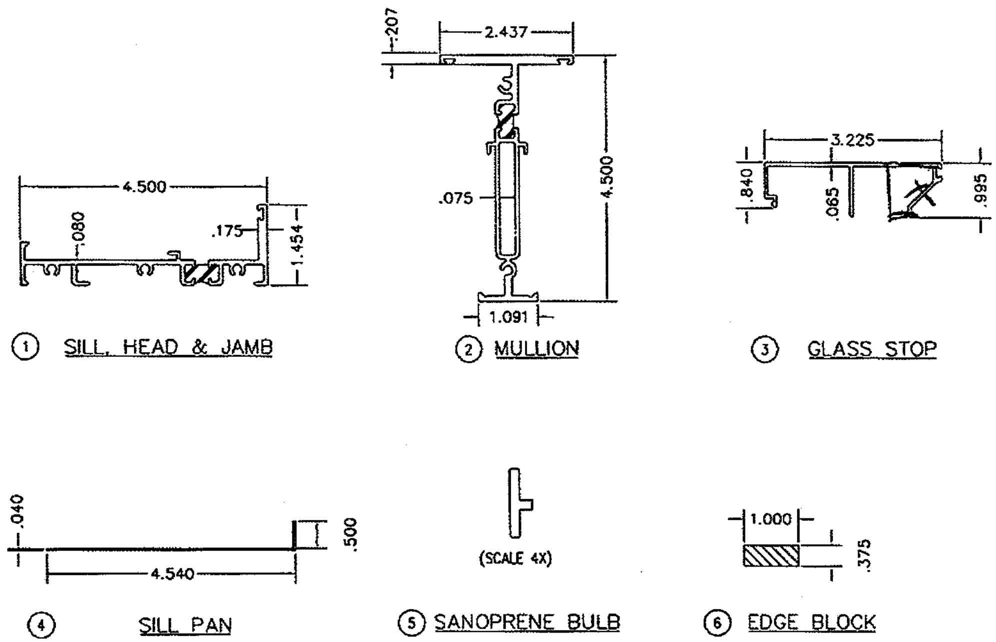
9455 1 JAN 0 2010
Report# Date
Tech

VALIDATOR INITIAL

REVISIONS	DATE	DRAWN BY	COMMENTS	

FLEETWOOD WINDOWS AND DOORS
395 SMITTY AVE CORONA, CALIFORNIA 92880 - www.fleetwoodusa.com

TITLE: KONA 3800 - AAMA, FBC, ASTM 1886/1996 CERTIFICATION
CUSTOMER: FLEET WOOD WINDOWS AND DOORS
JOB NAME: KONA 3500 CERTIFICATION
DRAWN BY: KEVIN
DATE: 09/17/2009
JOB NUMBER: 253890
SCALE: 1:1
DRAWING NO.: CERT 3800-05
SHEET: 2 OF 3



ITEM #	PART	ITEM DESCRIPTION
		EXTRUSIONS
1	3805	SILL, HEAD JAMB
2	3806	MULLION
3	3801	GLASS STOP
4	3822	SILL PAN
5	OVP04	SANOPRENE BULB
6	FW-1006	EDGE BLOCK

Architectural Testing, Inc.
Test sample complies with these details
Deviations are noted

94551 JAN 05 2010
Report# Date
Tech

VALIDATOR INITIAL

FLEETWOOD
WINDOWS AND DOORS
395 SMITTY AVE CORONA, CALIFORNIA 92880 · www.fleetwoodusa.com

TITLE: KONA 3800 - AAMA, FBC, ASTM 1886/ 1996 CERTIFICATION
CUSTOMER: FLEETWOOD WINDOWS AND DOORS
JOB NAME: KONA 3800 CERTIFICATION
DRAWN BY: KEVIN
DATE: 09/17/2009
JOB NUMBER: 253895

REVISIONS	DATE	DRAWN BY	COMMENTS

SCALE: 1:1
DRAWING NO.: CERT 3800-09
SHEET: 3 OF 3