



AAMA 506 TEST REPORT

Report No.: D4097.02-501-44

Rendered to:

VEKA INC
Fombell, Pennsylvania

PRODUCT TYPE: PVC Single Hung Window
SERIES/MODEL: SH57WW/AL-Insert

Test Dates 12/18/13

Report Date: 03/23/15

Test Record Retention End Date: 01/27/18



1.0 Report Issued To: Veka Inc.
100 Veka Drive
Fombell, Pennsylvania 16123

2.0 Test Laboratory: Architectural Testing, Inc.
1140 Lincoln Avenue
Springdale, PA 15144
724-275-7100

3.0 Project Summary:

3.1 Product Type: PVC Single Hung Window

3.2 Series/Model: SH57WW/AL-Insert

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The samples tested met the performance requirements set forth in the referenced test procedures for a ± 2400 Pa (± 50.13 psf) Design Pressure with large missile impacts corresponding to Missile Level D and Wind Zone 3.

This product was originally tested as the MariTech Windows Series/Model 575, PVC Single Hung Window and is a reissue of the original Report No. D4097.01-501-44. This report is reissued in the name of Veka Inc. through written authorization by MariTech Windows.

3.4 Test Date: 12/18/2013

3.5 Test Location: Architectural Testing, Inc. test facility in Springdale, Pennsylvania.

3.6 Test Sample Source: The test specimens were provided by the client. Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.7 Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

3.8 List of Official Observers:

<u>Name</u>	<u>Company</u>
Lynn George	Architectural Testing, Inc.
Joe Allison	Architectural Testing, Inc.

4.0 Test Specification(s):

AAMA 506-08, *Voluntary Specifications for Impact and Cycle Testing of Fenestration Products.*

ASTM E 1886-05, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.*

ASTM E 1996-05, *Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.*

ASTM E 1996-09, *Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Wind Borne Debris in Hurricanes.*

5.0 Test Specimen Description:

5.1 Product Sizes:

Test Specimens #1 - #3:

Overall Area: 2.2 m ² (23.2 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	1118	44	1930	76
Interior sash	1064	41-7/8	894	35-3/16

5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, and jamb	Vinyl	Extruded
Sill dam (Dwg. No. D-200453)	Aluminum	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded
Sill dam	Straight cut and mechanically fastened	Secured through the sill into the wood buck with six #8 x 2" long pan head screws evenly spaced and beginning 3" in from each end. Sealed to the sill with a silicone silicone.

5.0 Test Specimen Description: (Continued)

5.3 Sash Construction:

Sash Member	Material	Description
Rails and stiles	Vinyl	Extruded
Fixed meeting rail	Vinyl	Extruded

	Joinery Type	Detail
All corners	Mitered	Thermally welded
Fixed meeting rail	Coped and butted	Secured through the jamb with two #8 x 3" long pan head screws at each end

5.4 Weatherstripping:

Description	Quantity	Location
0.187" backed by 0.320" thick polypile with center fin	1 Row	Fixed meeting rail and sill
0.187" backed by 0.320" thick polypile with center fin	2 Rows	All sash stiles
0.187" backed by 0.320" thick polypile with center fin	1 Row	All sash rails

5.5 Glazing:

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
3/4" IG	Butyl, single sealed	1/8" thick clear annealed 0.090" thick Solutia Saflex PVB 1/8" thick clear annealed	1/8" thick clear annealed	The fixed lite was interior glazed and the sash was exterior glazed. The glass was set against a bed of Sikaflex®-552 Sealant and secured with snap-on vinyl glazing beads.

5.0 Test Specimen Description: (Continued)

5.5 Glazing: (Continued)

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Fixed lite	1	1000 x 933	39-3/8 x 36-3/4	1/2"
Sash	1	972 x 797	38-1/4 x 31-3/8	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weepslot with cover	1" wide by 1/4" high	3	Exterior sill face, one 4-1/2" from the corners and one midspan
Weephole	1/4" diameter	2	Sill, one 2" from each end, draining the screen track to the hollow below
Weep	1-1/4" wide by 1/4" high	2	Intermediate sill wall, one at each end draining the sill track to the lower hollow
Weepslot	3/8" wide by 5/32" high	2	Bottom rail, one 3" from each end

5.7 Hardware:

Description	Quantity	Location
Metal pivot bar	2	Bottom rail, one at each end
Metal cam lock with adjacent metal keeper	2	Lock rail, one 8-1/2" from each end
Metal surface mount tilt latches	2	Lock rail, one at each end
Metal tilt latch retainer clip	2	Jambs, at the sash tilt latch location
Block and tackle balance	2	One per jamb

5.0 Test Specimen Description: (Continued)

5.8 Reinforcement:

Drawing Number	Location	Material
D-201059	Fixed meeting rail	Aluminum
D-200475	Sash stiles and bottom rail	Aluminum
D-200474	Lock rail	Aluminum

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 3/16" shim space. The nail fin perimeter of the window was sealed with a silicone sealant.

Location	Anchor Description	Anchor Location
Integral nail fin	#8 x 2" long pan head screws	Nominally spaced at 6" on center, and beginning at each corner
Sill	#8 x 2" long pan head screws	Six screws evenly spaced starting 3" in from each end through the sill extension and into the wood buck.

7.0 Test Results: The results are tabulated as follows:

ASTM E 1886, Large Missile Impact

Conditioning Temperature: 21°C (70°F)

Missile Weight: 3969 g (8.75 lbs)

Missile Length: 2.4 m (7' 9-15/16")

Muzzle Distance from Test Specimen: 5.2 m (17' 0")

Test Unit #1: Orientation within $\pm 5^\circ$ of horizontal

Impact #1: Missile Velocity: 15.4 m/s (50.5 fps)	
Impact Area:	Exterior center of sash
Observations:	Missile hit target area, no penetrations
Results:	Pass

Note: See Architectural Testing Sketch #1_ for impact locations.

Test Unit #2: Orientation within $\pm 5^\circ$ of horizontal

Impact #1: Missile Velocity: 15.4 m/s (50.5 fps)	
Impact Area:	Exterior upper right corner of sash
Observations:	Missile hit target area, no penetrations
Results:	Pass

Note: See Architectural Testing Sketch #2 for impact locations.

Test Unit #3: Orientation within $\pm 5^\circ$ of horizontal

Impact #1: Missile Velocity: 15.5 m/s (50.8 fps)	
Impact Area:	Exterior lower left corner of sash
Observations:	Missile hit target area, no penetrations
Results:	Pass

Note: See Architectural Testing Sketch #3 for impact locations.

7.0 Test Results: (Continued)
ASTM E 1886, Air Pressure Cycling

Test Unit #1

Design Pressure: ± 2400 Pa (± 50.13 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)		
			#1	#2	#3
480 to 1200 (10.0 to 25.1)	3500	1.34	3.5 (0.14)	9.3 (0.37)	3.5 (0.14)
0 to 1440 (0 to 30.1)	300	1.41	3.8 (0.15)	10.8 (0.42)	4.0 (0.16)
1200 to 1920 (25.1 to 40.1)	600	1.46	5.5 (0.22)	16.0 (0.63)	5.8 (0.23)
720 to 2400 (15.0 to 50.1)	100	2.03	6.8 (0.27)	18.8 (0.74)	7.0 (0.28)
			Permanent Set mm (inches)		
			0.3 (0.01)	1.8 (0.07)	0.5 (0.02)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)		
			#1	#2	#3
720 to 2400 (15.0 to 50.1)	50	2.02	8.0 (0.32)	18.0 (0.71)	1.3 (0.29)
1200 to 1920 (25.1 to 40.1)	1050	1.79	7.5 (0.30)	16.8 (0.66)	6.8 (0.27)
0 to 1440 (0 to 30.1)	50	2.34	5.8 (0.23)	12.3 (0.48)	5.0 (0.20)
480 to 1200 (10.0 to 25.1)	3350	2.02	5.5 (0.22)	11.5 (0.45)	5.0 (0.20)
			Permanent Set mm (inches)		
			1.5 (0.06)	1.8 (0.07)	1.0 (0.04)

Observations: No additional damage or deglazing was observed.

Result: Pass

Note: See Architectural Testing Sketch #4 for indicator locations. Test Specimens #1, #2 and #3 were cycled in a common chamber.

7.0 Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

Test Unit #2

Design Pressure: ± 2400 Pa (± 50.13 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)		
			#1	#2	#3
480 to 1200 (10.0 to 25.1)	3500	1.34	3.5 (0.14)	10.3 (0.40)	3.8 (0.15)
0 to 1440 (0 to 30.1)	300	1.41	3.5 (0.14)	11.3 (0.44)	4.3 (0.17)
1200 to 1920 (25.1 to 40.1)	600	1.46	5.0 (0.20)	16.5 (0.65)	6.8 (0.27)
720 to 2400 (15.0 to 50.1)	100	2.03	6.0 (0.24)	19.3 (0.76)	7.8 (0.31)
			Permanent Set mm (inches)		
			0.5 (0.02)	1.8 (0.07)	0.5 (0.02)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)		
			#1	#2	#3
720 to 2400 (15.0 to 50.1)	50	2.02	6.0 (0.24)	19.8 (0.78)	7.5 (0.30)
1200 to 1920 (25.1 to 40.1)	1050	1.79	5.5 (0.22)	18.0 (0.71)	6.8 (0.27)
0 to 1440 (0 to 30.1)	50	2.34	4.0 (0.16)	13.3 (0.52)	5.0 (0.20)
480 to 1200 (10.0 to 25.1)	3350	2.02	4.3 (0.17)	12.5 (0.49)	5.0 (0.20)
			Permanent Set mm (inches)		
			0.8 (0.03)	1.8 (0.07)	1.3 (0.05)

Observations: No additional damage or deglazing was observed.

Result: Pass

Note: See Architectural Testing Sketch #4 for indicator locations. Test Specimens #1, #2 and #3 were cycled in a common chamber.

7.0 Test Results: (Continued)

ASTM E 1886, Air Pressure Cycling

Test Unit #3

Design Pressure: ± 2400 Pa (± 50.13 psf)

POSITIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)		
			#1	#2	#3
480 to 1200 (10.0 to 25.1)	3500	1.34	3.0 (0.12)	10.3 (0.40)	3.8 (0.15)
0 to 1440 (0 to 30.1)	300	1.41	3.5 (0.14)	11.3 (0.44)	4.3 (0.17)
1200 to 1920 (25.1 to 40.1)	600	1.46	5.0 (0.20)	16.3 (0.64)	6.3 (0.25)
720 to 2400 (15.0 to 50.1)	100	2.03	5.8 (0.23)	19.0 (0.75)	7.3 (0.29)
			Permanent Set mm (inches)		
			0.3 (0.01)	1.3 (0.05)	0.3 (0.01)

NEGATIVE PRESSURE

Pressure Range Pa (psf)	Number of Cycles	Average Cycle Time (seconds)	Maximum Deflection at Indicator mm (inches)		
			#1	#2	#3
720 to 2400 (15.0 to 50.1)	50	2.02	6.0 (0.24)	17.0 (0.67)	8.3 (0.33)
1200 to 1920 (25.1 to 40.1)	1050	1.79	5.5 (0.22)	15.8 (0.62)	7.8 (0.31)
0 to 1440 (0 to 30.1)	50	2.34	4.3 (0.17)	11.8 (0.46)	6.0 (0.24)
480 to 1200 (10.0 to 25.1)	3350	2.02	3.8 (0.15)	11.0 (0.43)	5.8 (0.23)
			Permanent Set mm (inches)		
			1.0 (0.04)	1.8 (0.07)	1.5 (0.06)

Observations: No additional damage or deglazing was observed.

Result: Pass

Note: See Architectural Testing Sketch #4 for indicator locations. Test Specimens #1 and #2 were cycled in a common chamber.

General Note: *Upon completion of testing, the specimens met the requirements of Section 7 of ASTM E 1996.*

8.0 Test Equipment:

Cannon: Constructed from steel piping utilizing compressed air to propel the missile

Missile: 2x4 Southern Pine

Timing Device: Electronic Beam Type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device

Deflection Measuring Device: Linear transducers

Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.



This report is reissued in the name of Veka Inc. through written authorization of MariTech Windows to whom the original report was rendered. The original MariTech Windows Report No. is D4097.01-501-44.

The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

If test specimen contains glazing, no conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) 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.

Joseph E. Allison
Senior Technician

Lynn George
Director – Regional Operations

JEA:sld

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Sketches (4)

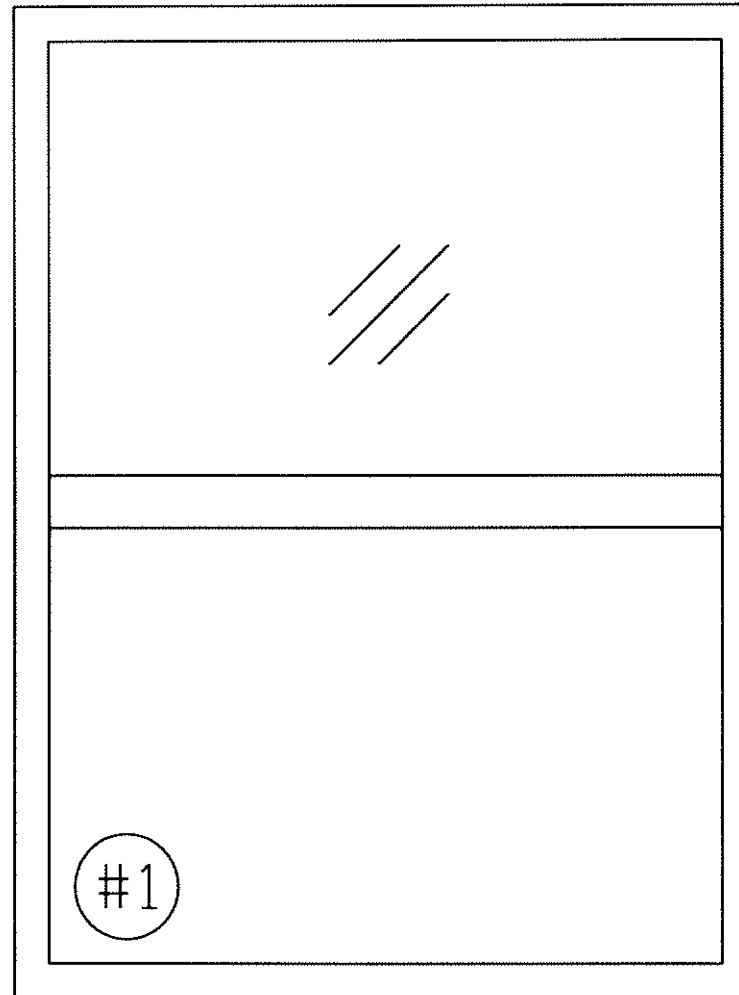
Appendix-B: Drawing(s) (1) Complete drawings packet on file with Intertek-ATI



Appendix A

Sketches

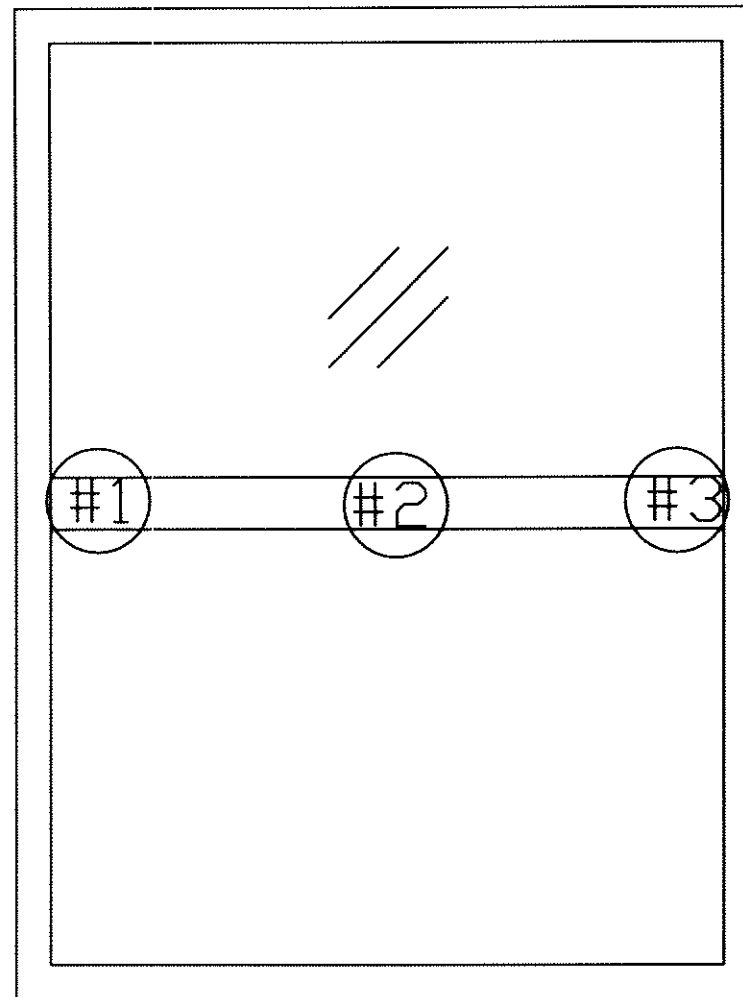
REV	DATE	DESCRIPTION	BY
			LG



Impact Locations

PROJECT NO. D4097.01 501-44	PROJECT NAME: 575 CLIENT: Maritech	 Architectural Testing	DRAWING Sketch #3 (Impacts)	DWG. BY: LG	SHEET 3 OF 4
				DATE: 01-20-14	

REV	DATE	DESCRIPTION	BY
			LG



INDICATOR LOCATIONS

PROJECT NO.
D4097.01
501-44

PROJECT NAME: 575
CLIENT: Maritech



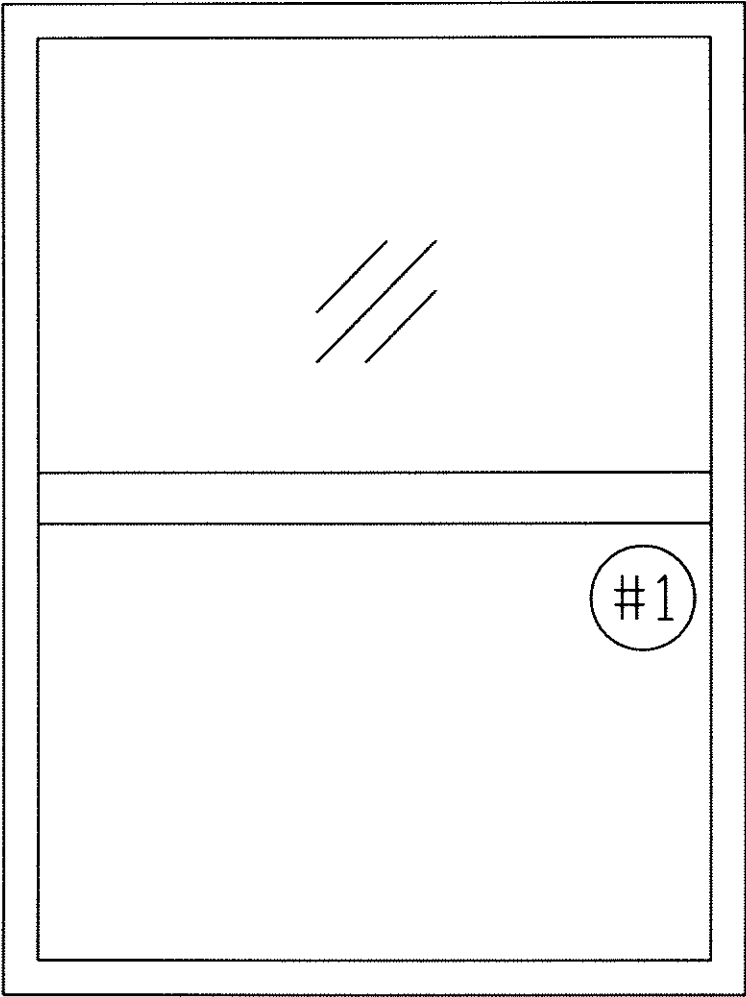
DRAWING

Sketch 4 (Indicator locations)

DWG. BY:
LG
DATE:
01-20-14

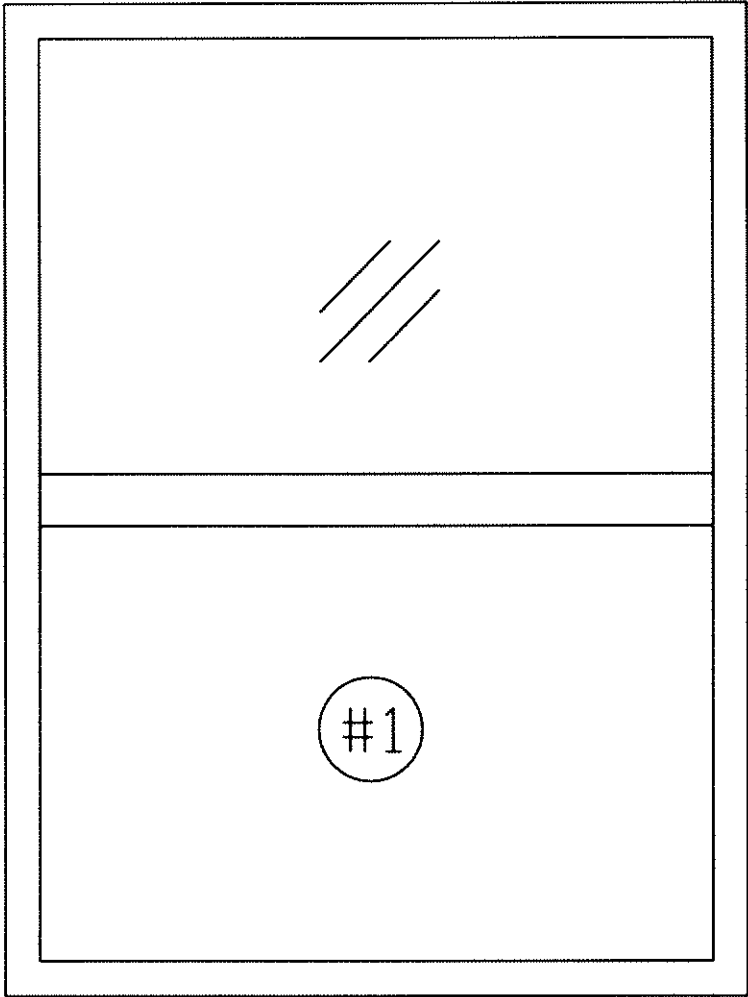
SHEET
4 OF
4

REV	DATE	DESCRIPTION	BY
			LG



Impact Locations

REV	DATE	DESCRIPTION	BY
			LG



Impact Locations



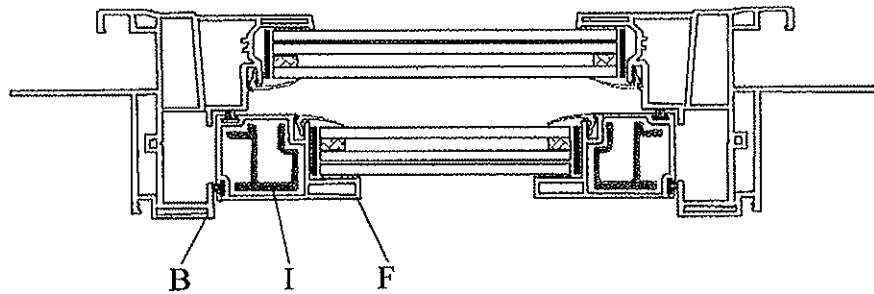
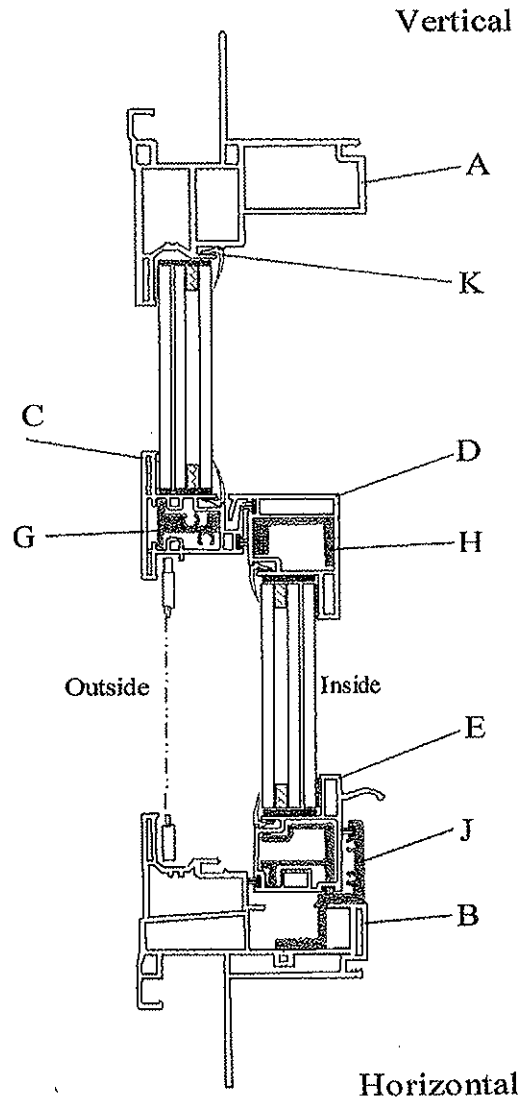
Appendix B

Drawings

Note: Complete drawings packet on file with Intertek-ATI

575 SH

- A. SH5702 - Head
- B. SH5701 - Sill, Jambs
- C. SH4604 - Meeting Rail
- D. SE4646 - Lock Rail
- E. SE4647 - Bottom Rail
- F. SE4645 - Stiles
- G. 1264 - Meeting Rail Rein.
- H. 1007 - Lock Rail Rein.
- I. 1008 - Bottom & Stile Rein.
- J. 1184 - Sill Dam Insert
- K. 1718R - Bead



Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report # 04097
Date 1/9/14 Tech JM