

**MIAMI-DADE COUNTY
PERFORMANCE TEST REPORT**

Rendered to:

**WASHOE EQUIPMENT, INC.
dba SUNOPTICS PRISMATIC SKYLIGHTS**

**SERIES/MODEL: Model 800MD, Signature
PRODUCT TYPE: Double Dome Fixed Skylight**

This report contains in its entirety:

**Cover Page: 1 page
Report Body: 12 pages
Sketches: 5 pages
Drawings: 4 pages**

**Report No.: 69598.02-301-18
Test Dates: 11/27/06
Through: 12/02/06
Report Date: 01/26/07
Expiration Date: 12/02/16
Miami-Dade County Notification No.: ATICA 06021**

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dba SUNOPTICS PRISMATIC SKYLIGHTS
6201 27th Street
Sacramento, California 95822

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Project Summary: Architectural Testing, Inc. (ATI) was contracted by Washoe Equipment, Inc. dba Sunoptics Prismatic Skylights to perform testing per Florida Building Code, Test Protocols for High Velocity Hurricane Zone, Protocols TAS 201-94, TAS 202-94 and TAS 203-94 on four (4) Series/Model 800MD, Signature, double dome fixed skylights. The samples tested met the performance requirements set forth in the protocols for a ± 30.0 psf *Design Pressure* rating. Test specimen description and results are reported herein.

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

TAS 201-94, *Impact Test Procedures.*

TAS 202-94, *Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading.*

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.*

Drawing Reference: The attached drawings have been reviewed by ATI and are representative of the samples tested.

Test Specimen Description:

Series/Model: 800MD Signature

Product Type: Curb Mount Aluminum Frame Fixed Double Dome Skylight

Dimensions: Outside of Curb: 5' 2-1/2" wide by 7' 8-1/2" high
Inside of Curb: 4' 11-1/2" wide by 7' 11-1/2" high
Overall Frame Size: 5' 3-5/8" wide by 8' 3-5/8" high

Dome: The interior and exterior domes had a pattern of parallel ridges and valleys arching across the width of the skylight. Seven (7) valleys were continuous across the dome and one (1) valley at each end was interrupted by the flat sloping geometric shape of the dome.

Ridge Spacing: Approximately 7-1/4"
Ridge Height: Approximately 1-1/2"
Valley Width: Approximately 4-1/2"

Dome Height: Exterior Dome: 14" at the valley
15-1/2" at the ridge
Interior Dome: 13" at the valley
14-1/2" at the ridge

Aluminum Retainer: 5' 1-1/8" wide by 8' 1-3/16" high

Overall Area: 39.46 ft²

Finish: Interior Dome: White prismatic acrylic
Exterior Dome: Clear polycarbonate
Frame: Mill finish aluminum

Glazing Type: Exterior Dome – 0.118" thick Lexan XL10 Polycarbonate
Interior Dome – SR 25 White Prismatic Acrylic

Glazing Details: The interior dome was set from the exterior to the aluminum frame and a bead of silicone sealant. The exterior dome was set from the exterior to the interior dome flange and a bead of silicone sealant. The domes were held in place with an aluminum retainer which has serrations to engage the aluminum frame. The retainer was also attached to the aluminum frame with eight (8) #6 x 1/2" truss washer head self-drilling steel screws.

Test Specimen Description: (Continued)

Frame Construction: The aluminum frame corners were mitered and fully welded. An extruded vinyl thermal separator was snap-fit to the frame. The hollow between the separator and frame was filled with a beaded polystyrene foam core. A butt joint sealed with silicone was formed between the short side and long side thermal separators. One (1) 1-3/4" x 1/4" weep hole was located at the end of the long side of the frame.

Retainer Construction: The aluminum retainer corners were mitered.

Installation: The skylight was mounted onto a 2 x 6 Douglas Fir No. 2 curb and was attached with #12 x 1-1/2" hex washer head steel screws with rubber backed neo washer located approximately 5" from each corner and 18" on center. A 1-7/8" x 1/4" adhesive back foam pad was located between the frame and curb.

Test Results: The following results have been recorded:

Protocol TAS 202-94, Static Air Pressure Tests

Test Unit #1

Design Pressure: ±30.0 psf

Title of Test	Results				
Air Infiltration					
1.57 psf (25 mph)	<0.01 cfm/ft ²				
6.24 psf (50 mph)	<0.01 cfm/ft ²				
	Indicator Readings (inch)				
	#1	#2	#3	#4	#5
Structural Loads					
75% of Design Pressure (+22.6 psf)					
Maximum Deflection	0.16	0.28	0.19	0.19	0.19
Permanent Set	0.01	0.01	0.00	0.01	0.01
Design Pressure (+30.1 psf)					
Maximum Deflection	0.22	0.38	0.26	0.25	0.26
Permanent Set	0.01	0.03	0.02	0.01	0.02
75% of Design Pressure (-22.6 psf)					
Maximum Deflection	0.23	0.39	0.24	0.31	0.30
Permanent Set	0.03	0.06	0.03	0.04	0.04
Design Pressure (-30.1 psf)					
Maximum Deflection	0.34	0.59	0.36	0.45	0.45
Permanent Set	0.06	0.14	0.07	0.09	0.09
Water Infiltration					
15% Positive Design Pressure (+4.59 psf)	No Penetration				
Test Pressure (+90.2 psf)					
Maximum Deflection	0.41	0.71	0.46	0.43	0.69
Permanent Set	0.10	0.19	0.07	0.05	0.19
Test Pressure (-60.2 psf)					
Maximum Deflection	0.19	0.44	0.25	0.42	0.64
Permanent Set	0.04	0.11	0.04	0.06	0.16

Note: See ATI Sketch #1 for indicator locations.

Test Results: (Continued)

Protocol TAS 201-94, *Impact Test Procedures*

Missile Weight: 9.0 lbs

Muzzle Distance from Test Specimen: 17' 0"

Test Unit #1

Impact #1: Missile Velocity: 50.0 fps

Impact Area: Corner of unit

Observations: Interior dome shattered, no penetration

Results: Pass

Impact #2: Missile Velocity: 49.5 fps

Impact Area: Center of unit

Observations: Outer dome deformed, inner dome shattered, no penetration

Results: Pass

Note: Refer to ATI Sketch #3 for impact locations.

Test Unit #2

Impact #1: Missile Velocity: 50.2 fps

Impact Area: Center of unit

Observations: Outer dome deformed, inner dome shattered, no penetration

Results: Pass

Impact #2: Missile Velocity: 49.8 fps

Impact Area: Corner of unit

Observations: Interior dome shattered, no penetration

Results: Pass

Note: Refer to ATI Sketch #4 for impact locations.

Test Results: (Continued)

Protocol TAS 201-94, *Impact Test Procedures* (Continued)

Test Unit #4

Impact #1: Missile Velocity: 51.0 fps

Impact Area: Corner of unit

Observations: No penetration

Results: Pass

Impact #2: Missile Velocity: 50.3 fps

Impact Area: Center of unit

Observations: No penetration

Results: Pass

Note: Refer to ATI Sketch #5 for impact locations.

Test Results: (Continued)

Protocol TAS 203-94, Cyclic Wind Pressure Loading

Test Unit #1

Design Pressure: ±30.0 psf

POSITIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
6.0 to 15.0	3500	2.32	0.05	0.01	0.02
0 to 18.0	300	3.75	0.05	0.05	0.05
15.0 to 24.0	600	1.84	0.07	0.06	0.07
9.0 to 30.0	100	2.89	0.07	0.06	0.07
			Permanent Set (inch)		
			0.02	0.02	0.03

NEGATIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
9.0 to 30.0	50	2.99	0.03	0.04	0.04
15.0 to 24.0	1050	1.89	0.03	0.05	0.04
0 to 18.0	50	4.55	0.03	0.05	0.04
6.0 to 15.0	3350	2.31	0.02	0.05	0.04
			Permanent Set (inch)		
			<0.01	0.02	0.01

Result: Pass

Note: Refer to ATI Sketch #2 for indicator locations.

Test Results: (Continued)

Protocol TAS 203-94, Cyclic Wind Pressure Loading

Test Unit #2

Design Pressure: ±30.0 psf

POSITIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
6.0 to 15.0	3500	2.32	0.09	0.06	0.02
0 to 18.0	300	3.75	0.09	0.09	0.07
15.0 to 24.0	600	1.84	0.09	0.11	0.08
9.0 to 30.0	100	2.89	0.09	0.11	0.08
			Permanent Set (inch)		
			0.04	0.07	0.04

NEGATIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
9.0 to 30.0	50	2.99	0.07	0.08	0.04
15.0 to 24.0	1050	1.89	0.08	0.09	0.06
0 to 18.0	50	4.55	0.08	0.09	0.06
6.0 to 15.0	3350	2.31	0.08	0.09	0.06
			Permanent Set (inch)		
			0.02	0.02	0.01

Result: Pass

Note: Refer to ATI Sketch #2 for indicator locations.

Note: Test Unit #1 and Test Unit #2 were cycled in a common test chamber. Thus, Average Cycle Times are identical.

Test Results: (Continued)

Protocol TAS 203-94, Cyclic Wind Pressure Loading

Test Unit #4

Design Pressure: ±30.0 psf

POSITIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
6.0 to 15.0	3500	1.82	0.02	0.02	0.02
0 to 18.0	300	2.58	0.02	0.02	0.02
15.0 to 24.0	600	2.23	0.03	0.04	0.03
9.0 to 30.0	100	2.61	0.04	0.04	0.04
			Permanent Set (inch)		
			0.02	0.01	0.01

NEGATIVE PRESSURE

Pressure Range (psf)	Number of Cycles	Average Cycle Time (sec.)	Maximum Deflection at Indicator (inch)		
			#1	#2	#3
9.0 to 30.0	50	2.79	0.04	0.05	0.02
15.0 to 24.0	1050	2.01	0.05	0.05	0.03
0 to 18.0	50	2.79	0.04	0.04	0.03
6.0 to 15.0	3350	1.97	0.04	0.04	0.02
			Permanent Set (inch)		
			0.03	0.02	0.01

Result: Pass

Note: Refer to ATI Sketch #2 for indicator locations.

Test Equipment:

Cannon: Steel pipe barrel utilizing compressed air to propel the missile

Missile: 2 x 4 Southern Pine

Timing Device: Electronic Beam Type

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

Deflection Measuring Device: 1" dial indicators and 20" linear transducers

Laboratory Compliance Statements: The following are provided as required by the protocols for the testing reported herein.

Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building (2004).

Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building (2004).

Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1609 of the Florida Building Code, Building (2004).

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.

List of Official Observers:

Name

Company

Jim Blomberg

Sunoptics Prismatic Skylights

David Douglass

Architectural Testing, Inc.

Joseph A. Reed, P.E.

Architectural Testing, Inc.

Tyler Westerling

Architectural Testing, Inc.

Representative samples of the test specimen and a copy of this report will be retained by ATI for a period of ten years from the original test date. This report is the exclusive property of the client so named herein and is applicable to the sample tested. Results obtained are tested values and do not constitute an opinion or endorsement by this laboratory. This report may not be reproduced, except in full, without the approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Tyler Westerling
Project Manager

Joseph A. Reed, P.E.
Director - Engineering and Product Testing

TW: sj/cmd

Attachments (pages):

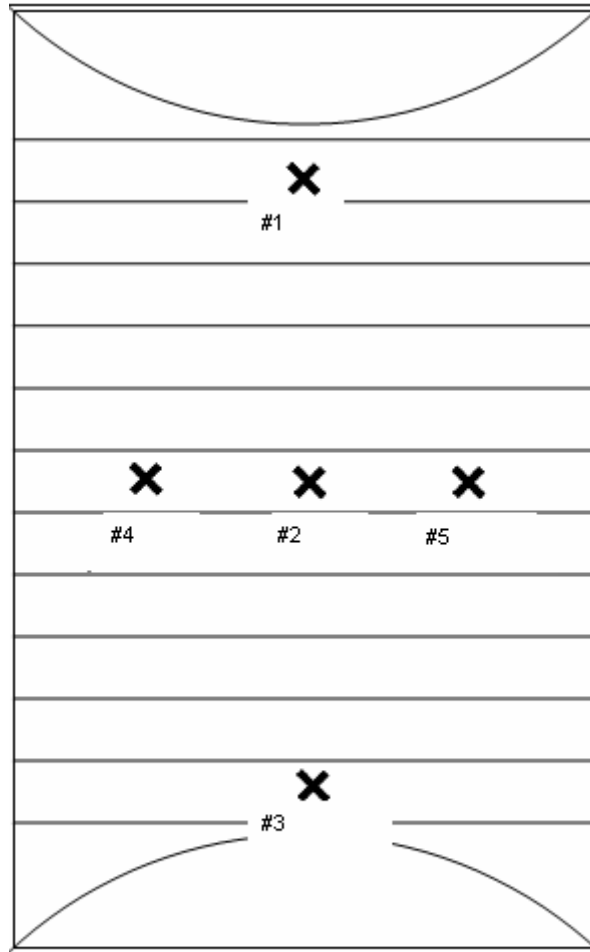
- Appendix-A: Sketches (5)
- Appendix-B: Drawings (4)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	01/26/07	N/A	Original report issue

APPENDIX A

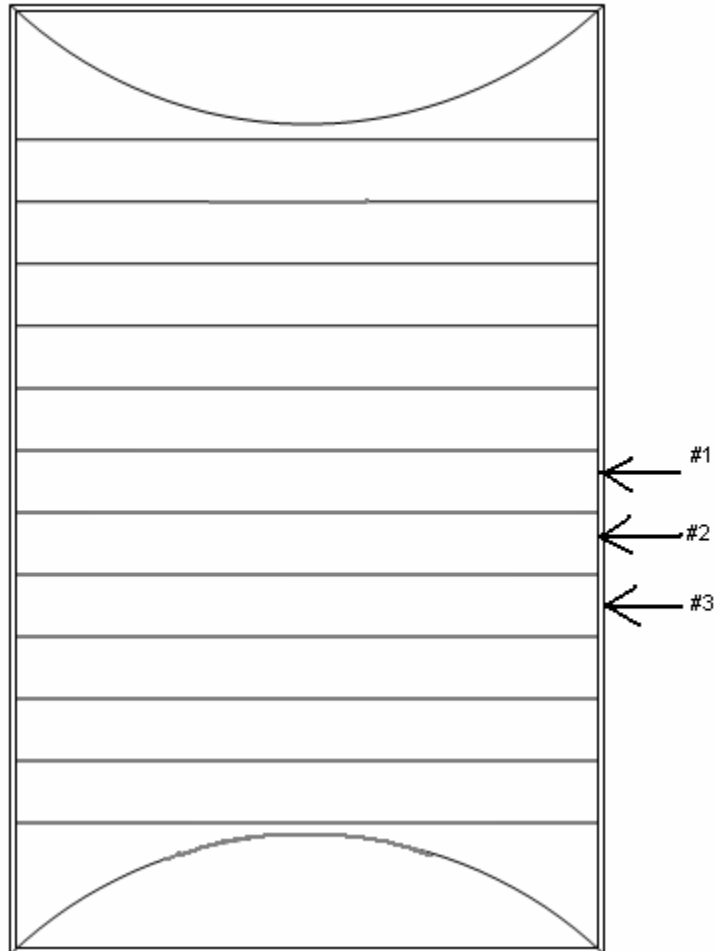
Sketches



X (Normal to Curved Surface)

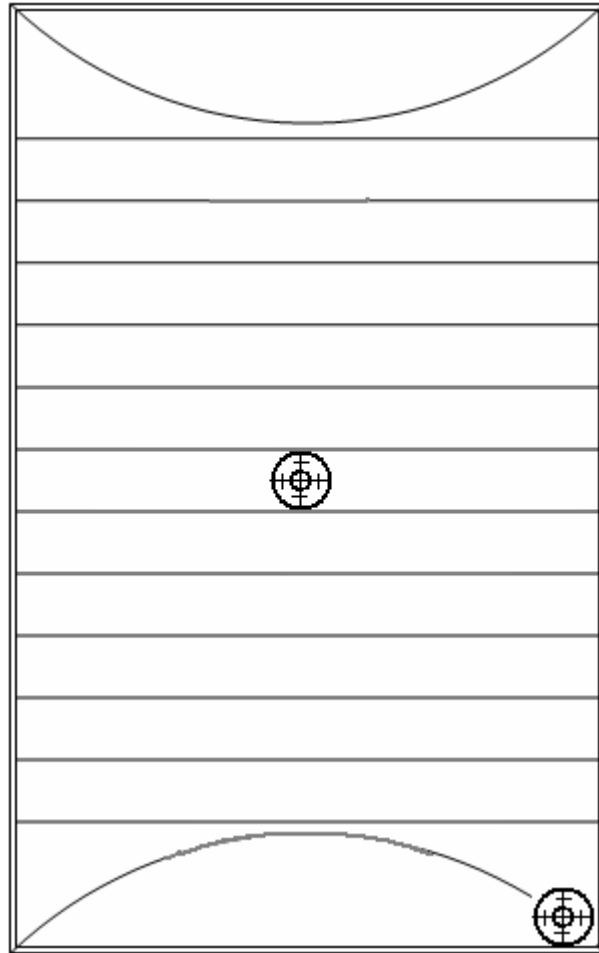
Sketch #1

Indicator Locations

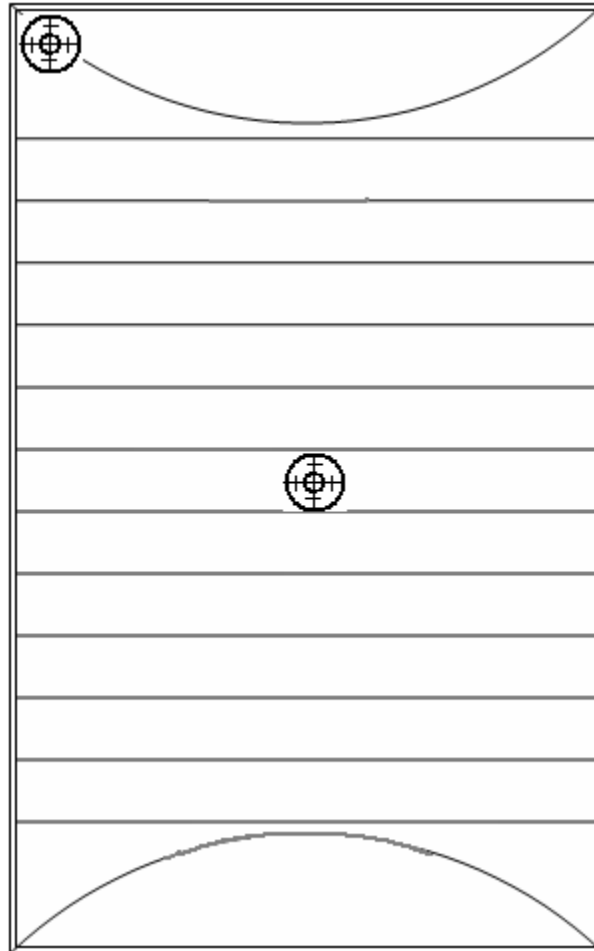


Note: Indicators #1 and #3 are on adjacent anchors and #2 is on the frame between.

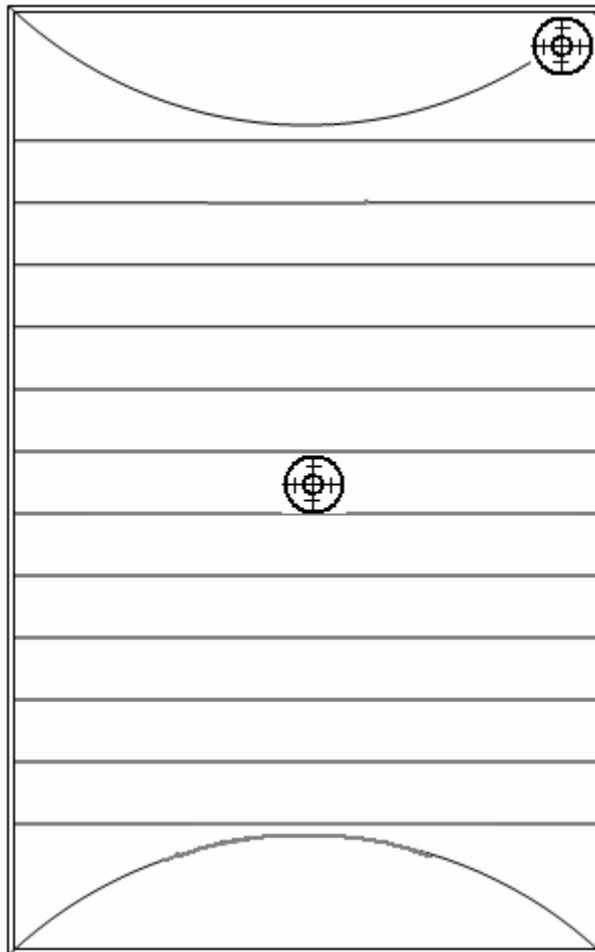
Sketch #2
Frame Indicator Location for Test Unit



Sketch #3
Impact Locations for Test Unit #2



Sketch #4
Impact Locations for Test Unit #2



Sketch #5
Impact Locations for Test Unit #3

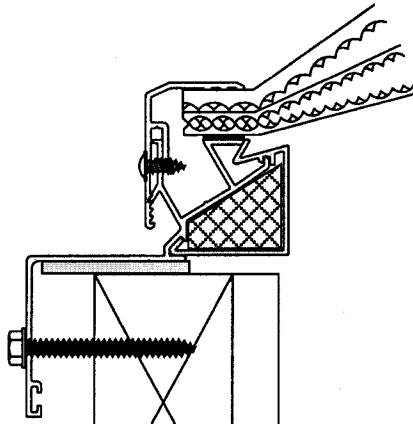
APPENDIX B

Drawings

SKYLIGHT INSTALLATION INSTRUCTIONS

1. Set skylight over prepared, flashed curbs, making sure skylight is square and evenly spaced on all four sides.
2. Mount skylight to the curb with plated, galvanized or aluminum screws, Using 1 fastener for each hole provided. Drive screws just snug to the skylight flange. Check skylight for squareness and readjust screws as necessary.

NOTE: *Caulking the top of the curb for an air seal is not required with Sunoptics skylights. All double and triple glazed units are supplied with a 1 1/2 inch by 1/4 inch air seal tape premounted on the underside of the skylight.*

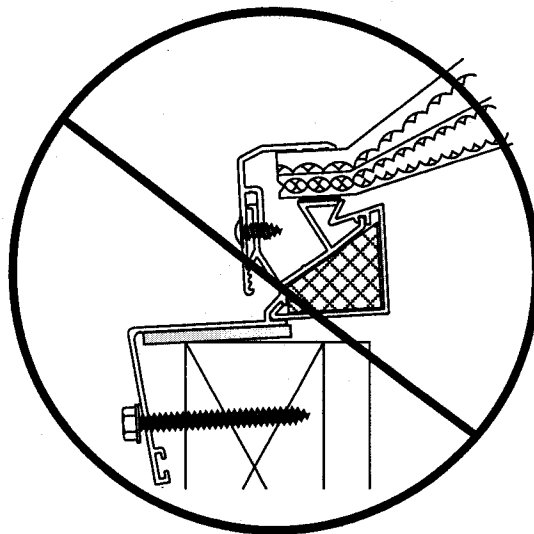


CORRECT MOUNTING

800MD frame shown. Installation instructions are similar for all Sunoptics curb mounted skylights.

NOTE:

When securing the skylight to the curb, run screws just snug to the skylight flange. Overtightening will distort the flange. This in turn may create forces which could crack the skylight lenses, or force it to pull out. This may void the warranty.



INCORRECT MOUNTING

Received By _____ Date _____

6-9-98
DATE 02-2006
DZ

SIL FLEX RTV 7500
SILICONE SEALANT
(CONTINUOUS)

.118 LEXAN XL10 POLYCARBONATE
OVER
SR25 WHITE PRISMATIC ACRYLIC

6063-T5
ALUMINUM
FRAMES

FOAM INSULATION

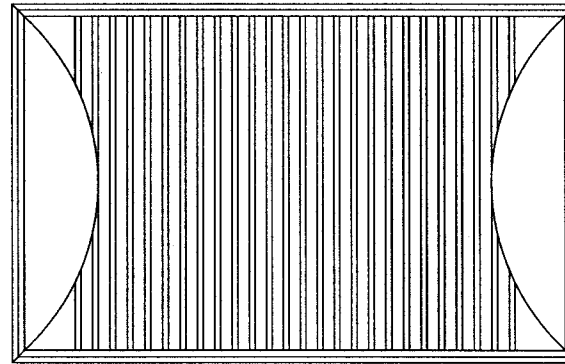
AIR SEAL TAPE
(CONTINUOUS)

THERMAL BREAK COVER
(WHITE)

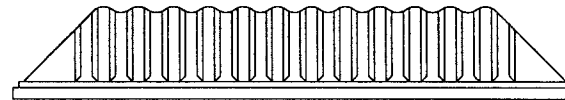
CONTINUOUS HELIARC
(TIG) WELD
(INSIDE & OUTSIDE)

12A X 1 1/2 HWH 18/8 S/S W/A 12 X 5/8 18/8 S/S
RUBBER BACKED NEO WASHER ATTACHED.
SCREW SPACING TO BE 5" IN FROM EACH END
THEN 18" ON CENTER. 20 SCREWS TOTAL.

63 5/8" X 99 5/8" NET FRAME



PLAN VIEW



SIDE VIEW

5080 MODEL 800MD FIXED
DOUBLE GLAZED
SIGNATURE SKYLIGHT

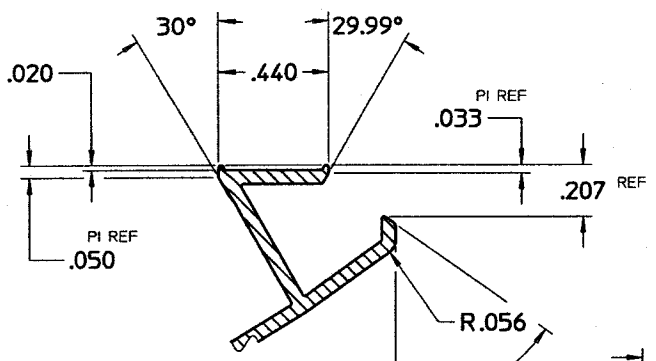
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DATE

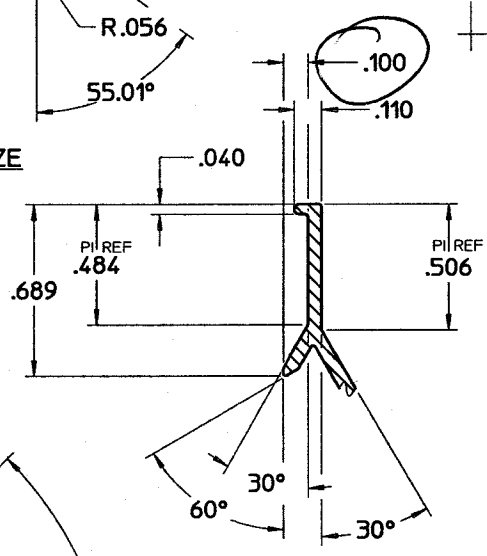
TECH

DZ

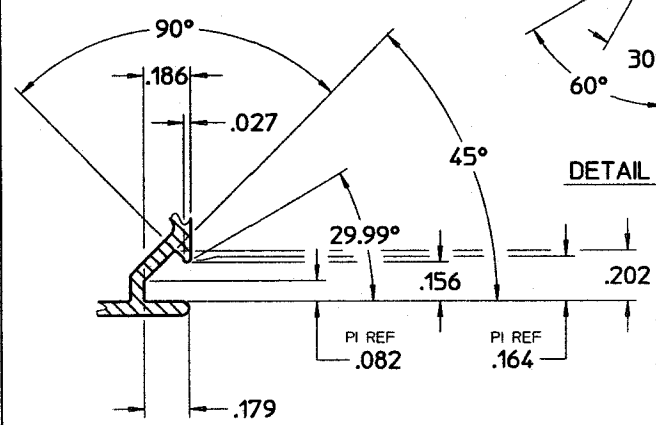
02 2006



DETAIL 'B' 2 X SIZE



DETAIL 'C' 2 X SIZE



DETAIL 'A' 2 X SIZE

DIE NUMBER
B-38807
DRAWING NUMBER

sapa:

7933 NE 21st Ave
Portland, OR 97211-0263
(800) 547-0790

SUNOPTICS SKYLIGHTS

CUSTOMER NAME

PART NAME **FRAME**

PART NO

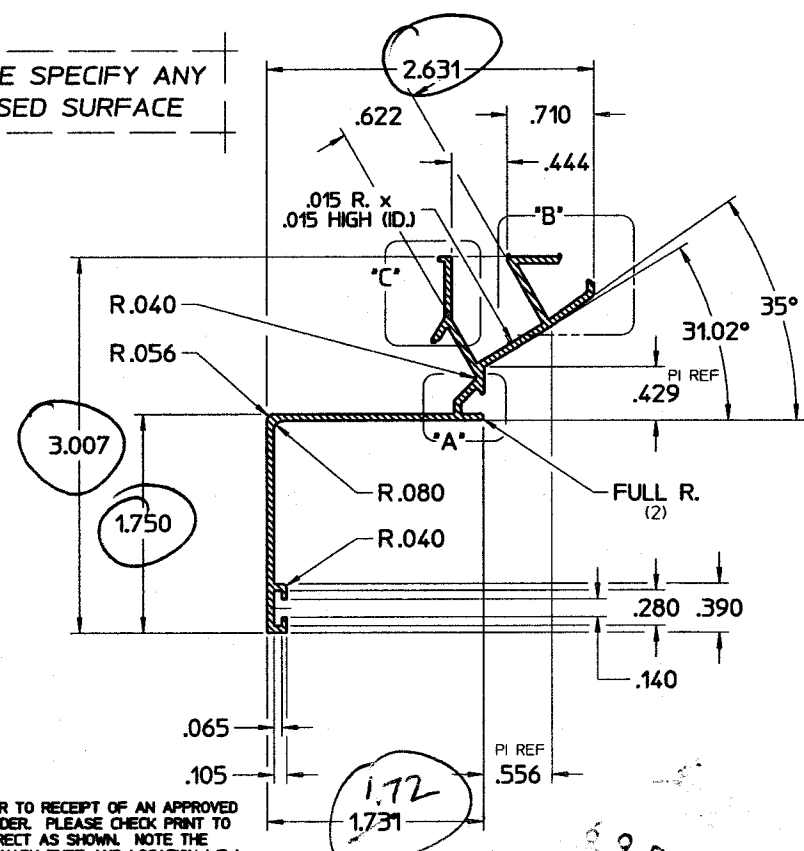
DATE **1-7-2005**

* DENOTES CRITICAL DIMENSION OR TOLERANCE

ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY U.O.S.

ID = Sapa, Inc. ID. MARK: .015 R. x .015 DEEP U.O.S. TYP WALL U.O.S: .055 ±.010 TYP RAD U.O.S: .010

PLEASE SPECIFY ANY EXPOSED SURFACE



ACTUAL SIZE

DIE CONSTRUCTION WILL NOT BEGIN PRIOR TO RECEIPT OF AN APPROVED DRAWING AND CONFIRMING PURCHASE ORDER. PLEASE CHECK PRINT TO INSURE THAT ALL DIMENSIONS ARE CORRECT AS SHOWN. NOTE THE EXPOSED SURFACE AND IDENTIFICATION MARK TYPE AND LOCATION (I D). ANY CHANGES MADE TO THIS PRINT WILL REQUIRE IT TO BE RE-SUBMITTED FOR YOUR APPROVAL. ELECTRONICALLY CHANGING, OR RENDERING ANY DIMENSION UNREADABLE WILL VOID THAT CHANGE TO THE DESIGN. OMITTED DIMENSIONS WILL BE ADDED AS A REF. DIMENSION. SAPA, INC. WILL EXTRUDE AND CHECK TO THIS PRINT ONLY. HAVING READ THE ABOVE STATEMENT I HEREBY APPROVE THIS DESIGN AS SUBMITTED AND AGREE TO SAPA, INC'S LIMITATIONS OF LIABILITIES AND WARRANTIES STATED ELSEWHERE ON THIS PRINT.

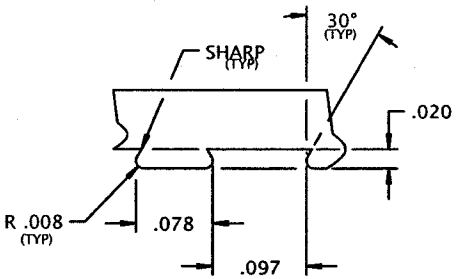
APPROVED BY _____ DATE _____

DIE NUMBER	
B-38807	
DRAWING NUMBER	
LB/FT	.503
AREA	.419
PERI	15.095
ADJ PERI	----
CCFAC	3.9 30
TYPE	SOLID
TEVOL	----
DRN BY	GAB
DE SIZE	
FD PLT	
BACKER	
BOLSTER	
SUB BOL	
HOLES	
BLR/R	

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89598

DEC 02 2005



DETAIL "B" 8x
(SIMILAR 4 PLACES)

NOTES:
1. ALUMINUM ASSOCIATION STANDARD TOLERANCES
APPLY UNLESS OTHERWISE SPECIFIED

18327
DIE NUMBER
B-23757
DRAWING NUMBER

Sapa Anodizing Inc.

7933 NE 21st Ave
Portland, OR 97211-0263
(800) 547-0790

ID = Sapa Anodizing Inc. I.D. MARK: .015 R. x .015 DEEP UNLESS OTHERWISE SPECIFIED / * DENOTES CRITICAL TOLERANCE

SUNOPTICS SKYLIGHTS

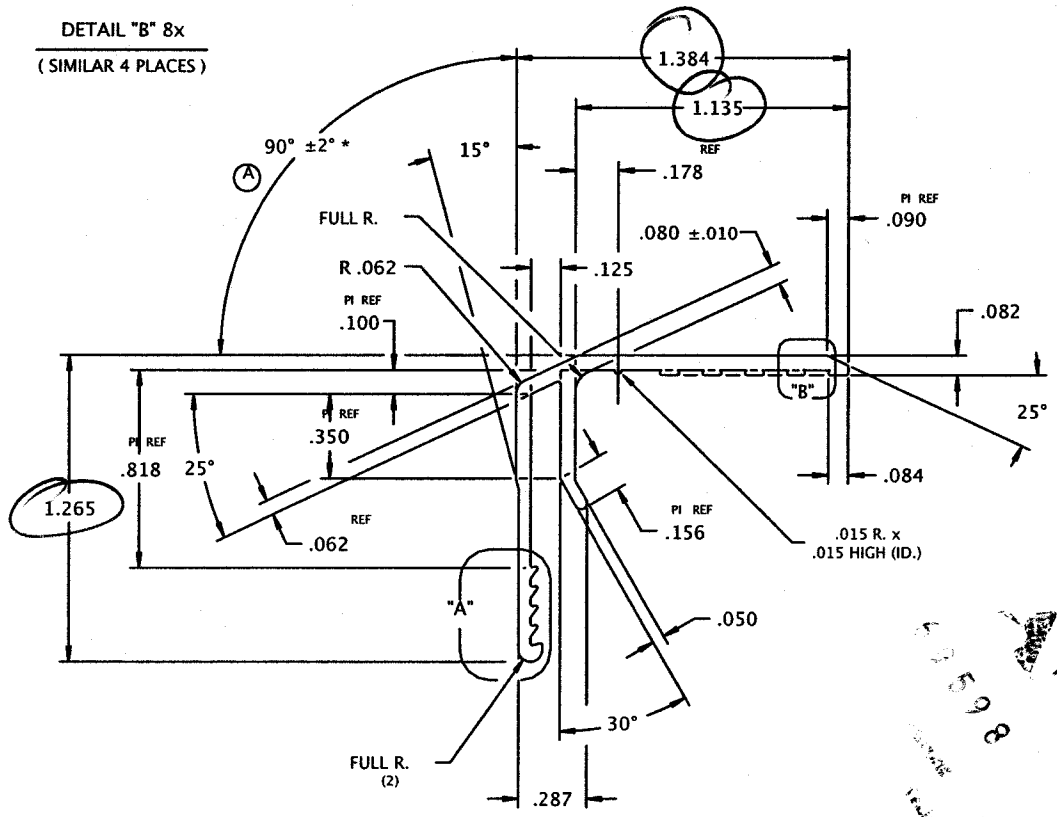
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PART NAME CLIP
PART NO DATE 3-12-97

18327

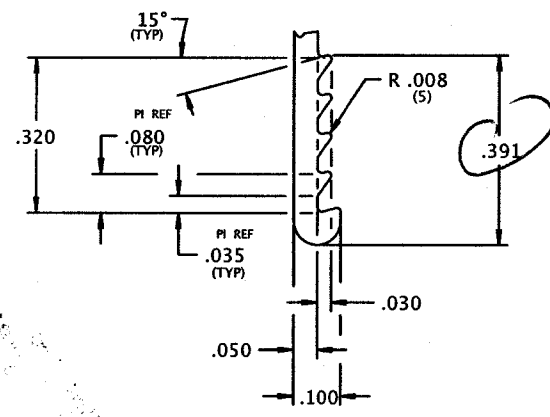
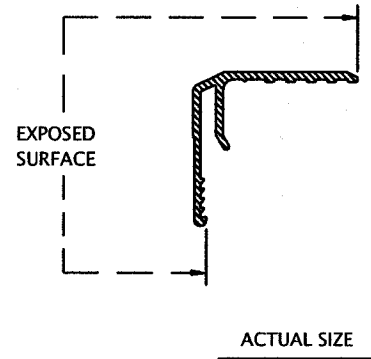
DIE NUMBER
B-23757

DRAWING NUMBER

LB/FT	.232
AREA	.193
PERI	6.558
ADJ PERI	----
CCIFAC	1.9 28
TYPE	S-HOL II
TIE.VOL	----
DRN BY	JJC
DIE SIZE	9 X 1-1/2
FD PLT	----
BACKER	5785
BOLSTER	310
SUB BOL	45
HOLES	4
BILIR/R	7" 54



2 X SIZE



DETAIL "A" 4x

REV A ADDED DIM AND TOLDS FOR CLARITY: 7-21-98 WSC

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3 3 5 9 8
Date: 3-7-2006