

BIRDVIEW SKYLIGHTS MIAMI-DADE, ASTM TEST REPORT

SCOPE OF WORK

TAS 201, TAS 202, AND TAS 203 – ASTM E 1886, 1996, AAMA /WDMA/CSA 101/I.S.2/A440
TESTING ON MODEL CM CURB MOUNTED SKYLIGHT

REPORT NUMBER

P1580.01-801-18-R0

TEST DATE(S)

9/27/22 - 9/30/22

ISSUE DATE

11/30/22

RECORD RETENTION END DATE

9/30/26

MIAMI-DADE COUNTY NOTIFICATION NO.

ATITX 8232201

LABORATORY CERTIFICATION NO.

20-0831-10

PAGES

17

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Tyler Westerling
Digitally Signed by: Tyler Westerling

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TEST REPORT FOR BIRDVIEW SKYLIGHTS

Report No.: P1580.01-801-18-R0

Date: 11/30/22

REPORT ISSUED TO
BIRDVIEW SKYLIGHTS
201 Longhorn Rd.
Ft. Worth, TX 76179

SECTION 1 SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Birdview Skylights to perform TAS 201, TAS 202, TAS 203 testing in accordance with Miami-Dade County requirements and ASTM E1886-13A and ASTM E1996-17, AAMA/WDMA/CSA 101/I.S.2/A440-17, *NAFS 2017 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights* on their Model CM Curb Mounted Skylight. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at the Intertek B&C test facility in Plano, TX. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2 SUMMARY OF TEST RESULTS

The specimens tested met the performance requirements set forth in the protocols.

Product Type: Skylight

Series/Model: CM Curb Mounted Skylight

SPEC.	TEST PROTOCOL	DESIGN PRESSURE
1	TAS 202	+60 / -140 psf
1	TAS 201/203 – ASTM E1886-13A/1996-17 (Large Missile)	+60 / -140 psf
2	TAS 201/203 – ASTM E1886-13A/1996-17 (Large Missile)	+60 / -140 psf
3	TAS 201/203 – ASTM E1886-13A/1996-17 (Large Missile)	+60 / -140 psf

SPECIMEN 1	RESULTS
Primary Product Designator	SKP-PG60
Design Pressure	+2880 Pa (+60.15 psf)
Air Infiltration	<0.10 L/s/m ² (<0.01 cfm/ft ²)
Canadian Air Exfiltration	<0.10 L/s/m ² (<0.01 cfm/ft ²)
Water Penetration Resistance Test Pressure	720 Pa (15.04 psf)

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For INTERTEK B&C:

COMPLETED BY:	Jeffrey Crump, FMPC	REVIEWED BY:	Tyler Westerling, P.E.
TITLE:	Laboratory Manager – Building and Construction	TITLE:	Operations Manager
SIGNATURE:		SIGNATURE:	
DATE:	11/30/22	DATE:	11/30/22

JC:cm

SECTION 3

TEST METHOD(S)

The specimens were evaluated in accordance with the following:

TAS 201-94, *Impact Test Procedures*

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

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

ASTM E1886-13a, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*

ASTM E1996-17, *Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*

AAMA/WDMA/CSA 101/I.S.2/A440-17, *NAFS 2017 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

SECTION 4

MATERIAL SOURCE/INSTALLATION

Test specimens were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of ten years from the test completion date.

Then specimen was installed into a Pine wood test buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of the door was sealed with sealant. Installation of the tested product was performed by the client.

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Specimens #1-3

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Frame	#12 screw (minimum 1-1/4" embedment)	Screws attached 3-1/2" from each corner and max. 12" on center. Installation holes through extruded aluminum angle are pre punched.

SECTION 5 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

SECTION 6 LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Tyler Westerling, P.E.	Intertek B&C
Jeffrey Crump	Intertek B&C

SECTION 7 TEST SPECIMEN DESCRIPTION

Product Type: Polycarbonate Skylight

Series/Model: CM Curb Mount Skylight

Specimens #1-3

Product Size:

OVERALL AREA:	WIDTH		HEIGHT	
	millimeters	inches	millimeters	inches
4.72 m ² (50.9 ft ²)				
Sub-Frame Overall Size	2515	99	1880	74
Daylight Opening	2473	97-3/8	1829	72

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Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Frame members	6063-T5 Aluminum	Tower (part #11363) Extruded aluminum shape, mitered and welded at four corners.
Retaining angle	6063-T5 Aluminum	Tower (part #957) Extruded aluminum shape, mitered and welded at four corners.
	JOINERY TYPE	DETAIL
All corners	Mechanical	Mitered and heliarc TIG weld

Dome Construction:

MEMBER	MATERIAL	DESCRIPTION
Outer and Inner Dome	Polycarbonate	0.118" enhanced outer dome and 0.100" general purpose inner dome.

Reinforcement: Reinforcement was not utilized

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
Santoprene rubber gasket	1 row at perimeter	Internal vertical of aluminum frame under inner dome.

Glazing: No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.

Specimens #1-5

DOMES TYPE	DOMES MAKEUP	GLAZING METHOD
Polycarbonate	0.118" UV enhanced outer dome and 0.100" general purpose inner dome.	Inner and outer domes are placed onto santoprene gasket. GE SCS 1000 silicone applied between retaining angle and outer dome with a 1-1/2" glazing bite and in between inner and outer dome. Retaining angle attached to lateral perimeter of extruded frame with #10 x 3/8" stainless steel fastener, 3-1/2" from each corner and max. 12" on center. Retaining angle attached on top of domes with #10 x 1" stainless steel fastener with neoprene gasket, 12" from each corner and max. 12" on center.

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Drainage:

DESCRIPTION	QUANTITY	LOCATION
1/4" weep hole	1 per	Each corner.

Hardware: Hardware was not utilized

SECTION 8

TEST RESULTS TEST SPECIMEN #1

The temperature during testing was 23°C (72°F). The results are tabulated as follows:

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.10 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.10 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²) max.	1
Water Penetration, per ASTM E547 and ASTM E331 at 720 Pa (15.04 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E330 Deflections taken at anchors +2880 Pa (+60.15 psf) -6720 Pa (-140.35psf)	<.10 mm (<0.01") <.10 mm (<0.01")	17.3 mm (0.07") max. 17.3 mm (0.07") max.	1, 4, 5, 6, 7
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.10 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E283 at 75 Pa (1.57 psf)	<0.10 L/s/m ² (<0.01 cfm/ft ²)	1.5 L/s/m ² (0.30 cfm/ft ²) max.	1
Water Penetration, per ASTM E547 and ASTM E331 at 720 Pa (15.04 psf)	Pass	No leakage	2
Uniform Load Structural, per ASTM E330 Permanent set taken at anchors +8640 Pa (+180.09 psf) -13440 Pa (-280.70 psf)	<.10 mm (<0.01") <.10 mm (<0.01")	2.3 mm (0.05) max. 2.3 mm (0.05") max.	1, 4, 6, 7
Forced Entry Resistance, per ASTM 588	Pass	No entry	

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

Note 2: Test Dates 09/27/22 Time: 8:00AM (Air Note Only)

Note 3: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 4: The deflections reported are limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation.

Note 5: Loads were held for 30 seconds.

Note 6: Tape and film were not used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

SECTION 9

TEST RESULTS

Protocol TAS 202-94, Static Air Pressure

Test Date(s): 9/27/22 through 10/4/22

The temperature during testing was 18°C (65°F). The results are tabulated as follows:

Test Specimen #1: Preload and Design Load per TAS 202 (30 sec. load)

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+90 50% of Test Pressure	1	.02		.00	
	2	.02	.07	.01	.02
	3	.01		.01	
-140 50% of Test Pressure	1	.18		.04	
	2	.23	.07	.04	.02
	3	.19		.03	
+60.00 Design Pressure	1	.01		.00	
	2	.01	.07	.01	.02
	3	.01		.01	
-140.00 Design Pressure	1	.18		.04	
	2	.23	.07	.04	.02
	3	.19		.03	

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LOAD (psf)	INDICATOR LOCATION	PERMANENT SET (in.)	
		MEASURED	ALLOWED
+180.00 Test Pressure	1	.02	
	2	.01	.02
	3	.01	
-280.00 Test Pressure	1	.04	
	2	.05	.02
	3	.04	

Note 1: Positive and negative uniform static load test loads were held for 30 seconds.

Note 2: Tape and film were not used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

Note 3: See Sketch #2 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.

Test Specimen #1: Water Penetration per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, per TAS 202 at 720 Pa (15.04 psf)	Pass	No leakage	2

Test Specimen #1: Air Leakage per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration per TAS 202 at 6.27 psf (50 mph)	<0.10 L/s/m ² (<.10 cfm/ft ²)	.15 L/s/m ² (0.30 cfm/ft ²) max.	1

Note 1: Test Date 06/23/21 / Time: 10:00 AM (Air Note Only)

Test Specimen #1: Forced Entry Resistance per TAS 202

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Forced Entry Resistance, per 588	Pass	No entry	

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SECTION 10

TEST RESULTS TEST SPECIMEN #1

Protocol TAS 201-94, ASTM E1996 *Large Missile Impact Procedures*

Test Date(s): 9/28/22 through 09/30/22

The temperature during testing was 23°C (72°F). The results are tabulated as follows:

Specimen #1

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)	RESULT
1	9.0	96	50.80	Pass - No Tear or Rupture
2	9.0	96	50.40	Pass - No Tear or Rupture

Specimen #2

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)	RESULT
1	9.0	96	50.30	Pass - No Tear or Rupture
2	9.0	96	50.20	Pass - No Tear or Rupture

Specimen #3

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)	RESULT
1	9.0	96	50.20	Pass - No Tear or Rupture
2	9.0	96	50.40	Pass - No Tear or Rupture

Note 2: See Sketch #1 for impact locations.

Protocol TAS 203-94, ASTM E 1996 *Cyclic Wind Pressure Loading*

Test Date(s): 9/28/22 through 10/04/22

The temperature during testing was 23°C (72°F). The results are tabulated as follows:

Test Specimen #1: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE			
+60.0 / -140.0 psf	1	2	3	4
POSITIVE PRESSURE RANGE (psf)	12.0 – 30.0	0 – 36.0	30.0 – 48.0	18.0 – 60.0
AVERAGE CYCLE TIME (sec.)	2.8	2.7	2.6	2.9

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NUMBER OF CYCLES	3500	300	600	100
	5	6	7	8
NEGATIVE PRESSURE RANGE (psf)	42.0 – 140.0	70.0 – 112.0	0 – 84.0	28.0 – 70.0
AVERAGE CYCLE TIME (sec.)	2.8	2.7	2.6	2.6
NUMBER OF CYCLES	50	1050	50	3350

Test Specimen #2: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE			
+60.0 / -140.0 psf	1	2	3	4
POSITIVE PRESSURE RANGE (psf)	12.0 – 30.0	0 – 36.0	30.0 – 48.0	18.0 – 60.0
AVERAGE CYCLE TIME (sec.)	2.8	2.9	2.6	2.7
NUMBER OF CYCLES	3500	300	600	100
	5	6	7	8
NEGATIVE PRESSURE RANGE (psf)	42.0 – 140.0	70.0 – 112.0	0 – 84.0	28.0 – 70.0
AVERAGE CYCLE TIME (sec.)	2.9	2.8	2.8	2.9
NUMBER OF CYCLES	50	1050	50	3350

Test Specimen #3: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	STAGE			
+60.0 / -140.0 psf	1	2	3	4
POSITIVE PRESSURE RANGE (psf)	12.0 – 30.0	0 – 36.0	30.0 – 48.0	18.0 – 60.0
AVERAGE CYCLE TIME (sec.)	2.9	2.7	2.8	2.6
NUMBER OF CYCLES	3500	300	600	100
	5	6	7	8
NEGATIVE PRESSURE RANGE (psf)	42.0 – 140.0	70.0 – 112.0	0 – 84.0	28.0 – 70.0
AVERAGE CYCLE TIME (sec.)	2.9	2.9	2.9	2.8
NUMBER OF CYCLES	50	1050	50	3350

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SECTION 11**CONCLUSIONS**

The large missiles impacted each intended target. Each impact location was carefully inspected. No signs of penetration, rupture, or opening after the large missile impact test were observed; as such, each test specimen satisfies the large missile requirements of TAS 201. Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

No signs of failure were observed in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202. Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

No signs of failure were observed in any area of the test specimens during the cyclic load test; as such, the test specimens satisfy the cyclic load requirements of TAS 203. Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1626 of the Florida Building Code.

The specimen(s) tested met the performance requirements set forth in the referenced test procedures for a +2880/-6720 Pa (+60.15 / -140.35 psf) Design Pressure with missile impacts corresponding to Missile Level D and Wind Zone 4. The specimens met the requirements of Section 7 of ASTM E1996.

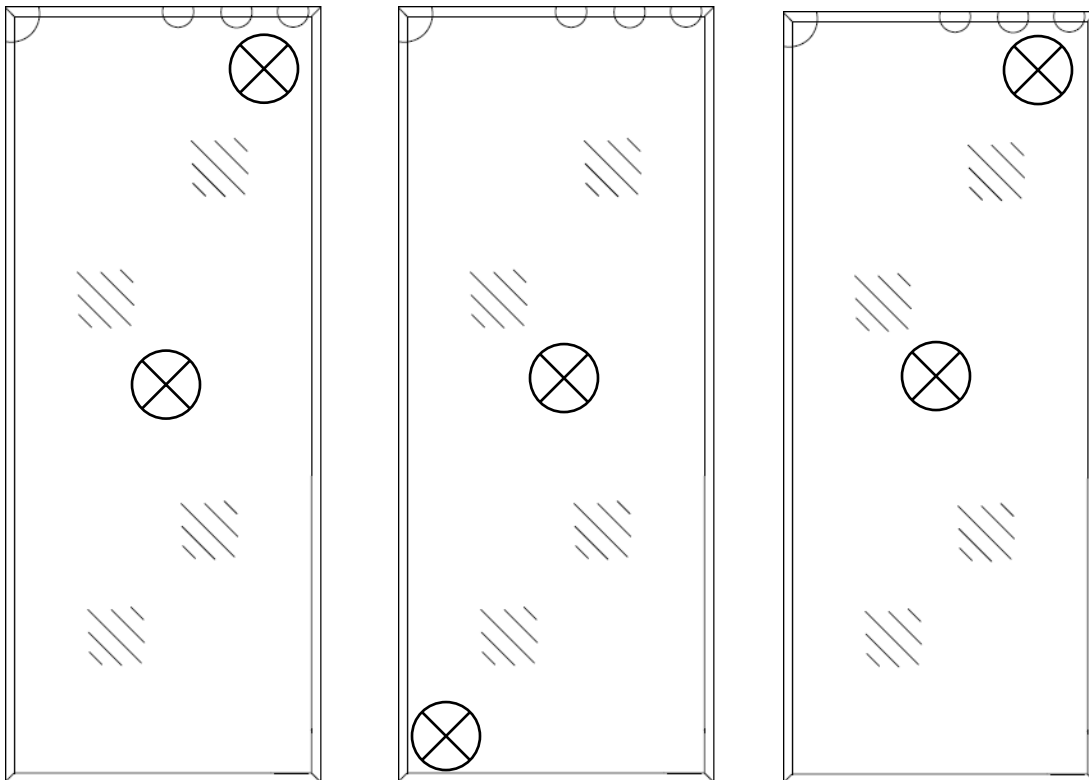
TEST REPORT FOR BIRDVIEW SKYLIGHTS

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SECTION 12
IMPACT LOCATIONS

Test Specimen 1-3

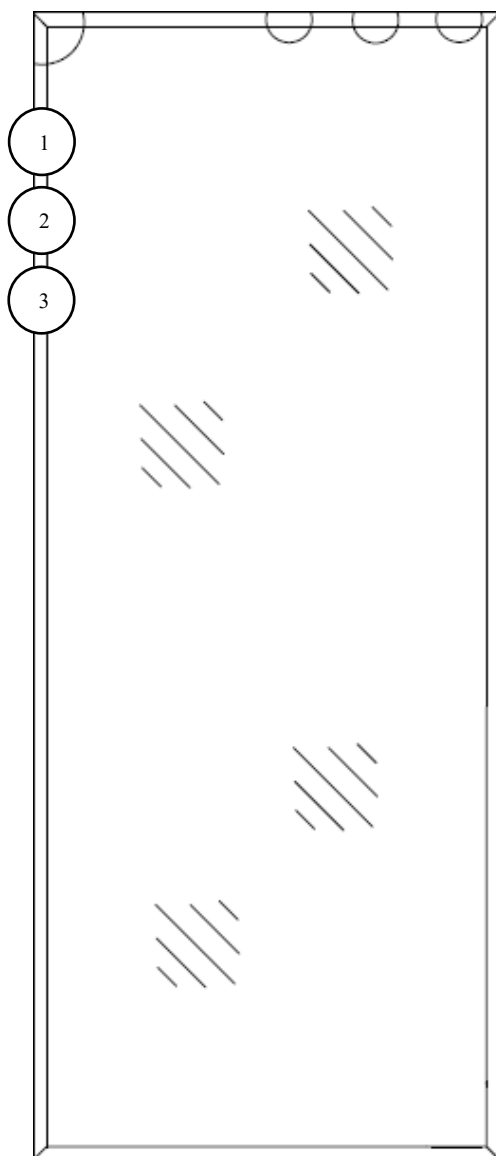


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SKETCH 2 - TAS 202 Indicator Locations





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TEST REPORT FOR BIRDVIEW SKYLIGHTS

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Date: 11/30/22

1909 10th Street, Suite 100
Plano, Texas 75074

Telephone: 469-814-0687
www.intertek.com/building

SECTION 13

DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

Note: Complete drawings packet on file with Intertek B&C.

Detail #1: Frame, Angle & Glazing Section Detail

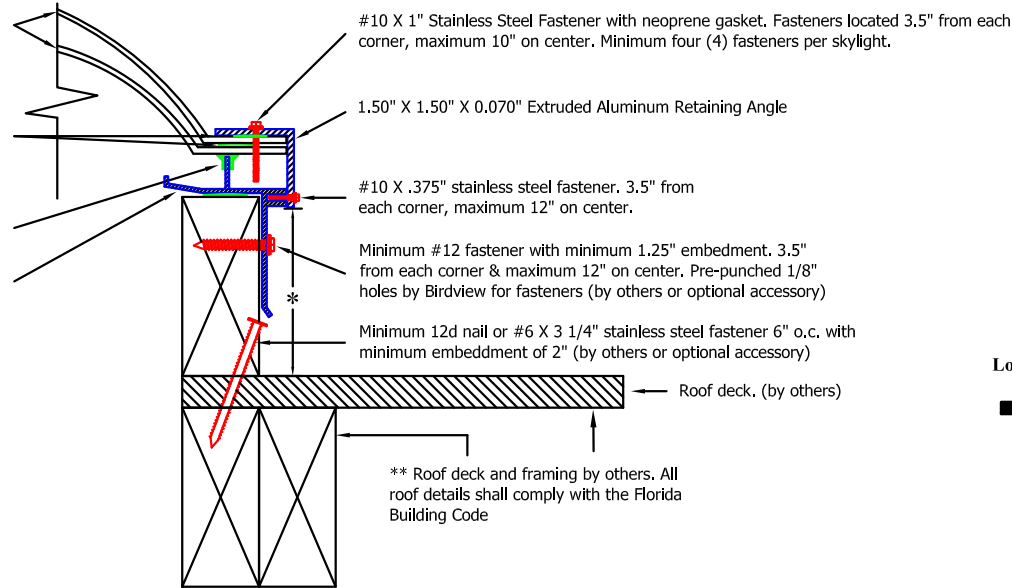
0.118" UV Enhanced Outer & 0.100" General Purpose Inner Polycarbonate Domes. Rise varies dependent on actual size but is not less than 10% of the smaller dimension of the length or width. Test Specimen = 9" Outer Dome & 7.5" Inner Dome.

GE SCS 1000 Silicone: Applied between retaining angle and outer dome with a 1.50" glazing bite. Applied between the inner and outer domes.

Continuous 10164 Santoprene Rubber Gasket #1409

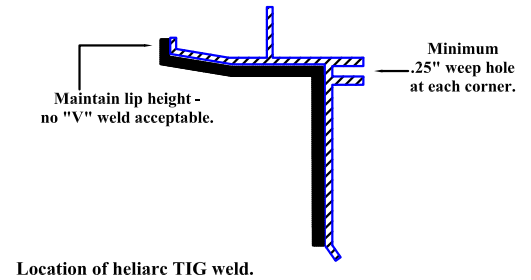
0.065" Extruded Aluminum Shape

* Minimum distance = 4" from aluminum frame to roof surface for shingles or BUR without insulation. For insulation and roof tile add insulation or roof tile thickness to 4" minimum height

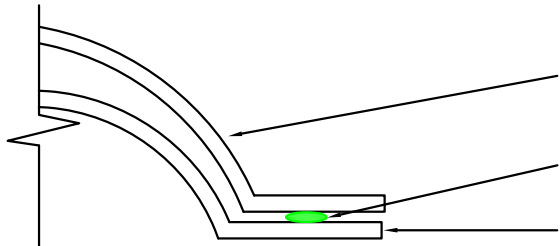


DESIGN PRESSURE = +60psf / -140psf

Detail #3 Aluminum Shape Weld Detail Tower Part #11363



Detail #2 Glazing Detail



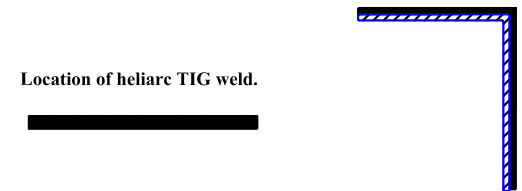
.118" UV Enhanced Polycarbonate Dome. Rise varies but is not less than 10% of the smaller dimension of the length or width. Test Specimen = 9".

GE SCS 1000 Silicone: Minimum 1/4" bead applied between the inner and outer domes.

0.100" Polycarbonate Dome. Rise varies but is not less than 10% of the smaller dimension of the length or width. Test Specimen = 7.5".

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	Verified by:	J.Crump

Detail #4 Aluminum Angle Corner Weld Detail Tower Part #957



Birdview SKYLIGHTS

201 Longhorn Rd, Fort Worth TX 76179
P: 817-439-9266 F: 817-232-8468

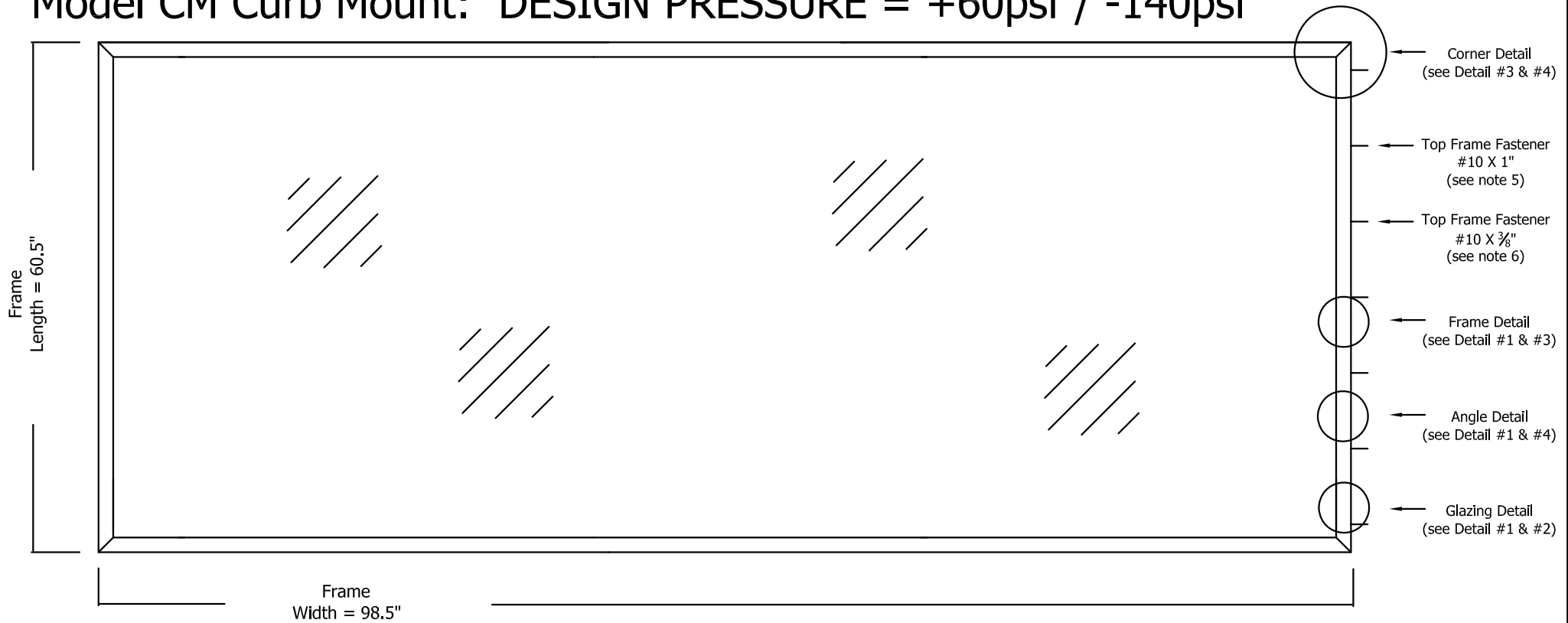
Birdview Skylights Model CM: Curb Mount Skylight

Date: October 11, 2022

Scale: NTS

Sheet 1 of 2

Model CM Curb Mount: DESIGN PRESSURE = +60psf / -140psf



Bill of Materials:

- 6063-T5 Extruded Aluminum Frame mitered and welded at four corners. Manufacturer: Tower Part #11363
- 6063-T5 Extruded Aluminum Angle mitered and welded at four corners. Manufacturer: Tower Part #957
- GE SCS 1000 Silicone: Minimum $\frac{1}{4}$ " bead applied between the inner and outer domes. Manufacturer: GE
- .118 UV Enhanced polycarbonate domes. Rise varies but is not less than 10% of the smaller dimension of the length or width. Test specimen = 9" outer dome & 7.5" inner dome. Manufacturer: Covestro or PalRam Americas
- #10 X 1" Stainless Steel Fastener with neoprene gasket. Fasteners located 3.5" from each corner, maximum 10" on center. Minimum one fastener per side and minimum four fasteners per skylight.
- #10 X .325" Stainless steel fasteners 3.5" from each corner, maximum 12" on center.
- Continuous 10164 Santoprene Rubber Gasket Part #1409.

Notes:

- This skylight is designed to comply with all zones, including the HVHZ, of the Florida Building Code.
- This skylight meets small & large missile impact resistance (TAS-201/ASTM E1886/ASTM E1996) and no other protection is required.
- All framing and roof deck is by others and must comply with the Florida Building Code.
- All sizes equal to or less than the test size total square footage are to be accepted under this NOA.
- Fasteners used to attach skylight to the existing roof structure are to be minimum #12 stainless steel with minimum embedment of 1.25"

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Birdview Skylights Model CM: Curb Mount Skylight

Date: October 11, 2022

Scale: NTS

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REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	11/30/22	N/A	Original Report Issue