Architectural Testing

OSHA FALL PROTECTION TEST REPORT

Rendered to:

VELUX AMERICA INC.

SERIES/MODEL: CM
PRODUCT TYPE: Fixed Polycarbonate Glazed Curb Mount Skylight

Report No:	**88221.01-109-44**
Revision 1:	**02/18/09**
Test Date:	**12/23/08**
Report Date:	**01/19/09**
Record Retention Date:	**12/23/12**

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York, PA 17406-8405
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Architectural Testing

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VELUX AMERICA INC.
P.O. Box 5001
(1418 Evans Pond Road)
Greenwood, South Carolina 29648-5001

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Project Summary: Architectural Testing, Inc. was contracted by VELUX America Inc. to perform tests on two Series/Model CM, fixed polycarbonate glazed curb mount skylights. The test specimens description and results are reported herein. The test specimens were supplied by the client.

Test Specification: The test specimens were tested to assess compliance with Occupational Safety and Health Administration/U.S. Department of Labor Regulations (Standards- 29 CFR)-1910.23(e)(8). A 200 lbf weight, fabricated from a bag filled with sand, was placed on the center of the dome for a minimum of 60 seconds and then dropped from varying heights above each skylight starting at 2' until permanent visible damage was noted. The highest impact load resulting in damage was recorded.

Test Specimen Description:

Series/Model: CM

Product Type: Fixed Polycarbonate Glazed Curb Mount Skylight

Test Specimen #1

Overall Size: 1219 mm (48") wide by 2438 mm (96") high

Curb Size: 1181 mm (46-1/2') wide by 2400 mm (94-1/2") high

Overall Area: 3.34 m^2 (36.0 ft^2)

Test Specimen #2

Overall Size: 1829 mm (72") wide by 1829 mm (72") high

Curb Size: 1788 mm (70-3/8") wide by 1788 mm (70-3/8") high

Overall Area: 2.97 m^2 (32.0 ft^2)

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Test Specimen Description: (Continued)

The following descriptions apply to all specimens.

Finish: All aluminum was anodized.

Weatherstripping: No weatherstripping was utilized.

Glazing Detail: The skylight dome was constructed of two domes, an interior acrylic dome measuring 0.120" thick and an exterior polycarbonate dome measuring 0.150" thick at the center of the dome. The edges of the polycarbonate sheets were secured to each other with a layer of double-sided adhesive foam tape. The polycarbonate dome was set against the aluminum main frame, resting on double-sided adhesive foam tape and secured with an "L" shaped aluminum cover frame. Double-sided adhesive foam tape was utilized between the cover frame and the dome. The cover frame was secured to the main frame with #12 x 1/4" hex head screws, located 5" from each corner and spaced 16" on center.

Frame Construction: The frames were constructed of extruded aluminum with mitered and welded corners, with silicone on each corner.

Installation: The skylight was installed onto a Spruce-Pine-Fir wood curb with #8 x 1-1/2" long pan head screws, located 5" from the corners and spaced 16" on center through predrilled holes. The test frame was placed on the floor and leveled prior to testing.

Test Results: The results are tabulated as follows:

Test Specimen #1

Test Method	Load Location	Results
OSHA Safety DropTest		
200 lbf at rest	Center of dome	No visible damage
400 lbf-ft (2' drop height)	Center of dome	No visible damage
800 lbf-ft (4' drop height)	Center of dome	No visible damage
1200 lbf-ft (6' drop height)	Center of dome	See Note #1

***Note #1**: At the 6' drop height, the interior and exterior polycarbonate glazing broke, allowing the weight to fall through the skylight.*

Test Results: (Continued)

Test Specimen #2

Test Method	Load Location	Results
OSHA Safety Drop Test		
200 lbf at rest	Center of dome	No visible damage
400 lbf-ft (2' drop height)	Center of dome	No visible damage
800 lbf-ft (4' drop height)	Center of dome	See Note #2

***Note #2**: At the 4' drop height, the polycarbonate dome deglazed from the frame. The weight of the fall did not allow the load to fall through the skylight.*

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.

Results obtained are tested values and were secured by using the designated test methods. No conclusions of any kind regarding the adequacy or inadequacy of the glazing 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: Aaron M. Shultz

Aaron M. Shultz
Technician

Digitally Signed by: Michael D. Stremmel

Michael D. Stremmel, P.E.
Senior Project Engineer

AMS:vlm

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photographs (1)
Appendix-B: Drawing (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	01/19/09	N/A	Original report issue
1	02/18/09	Page 2	Corrected Glazing Details
		Appendix B	Removed original drawing and inserted correct drawing

Appendix A

Photographs

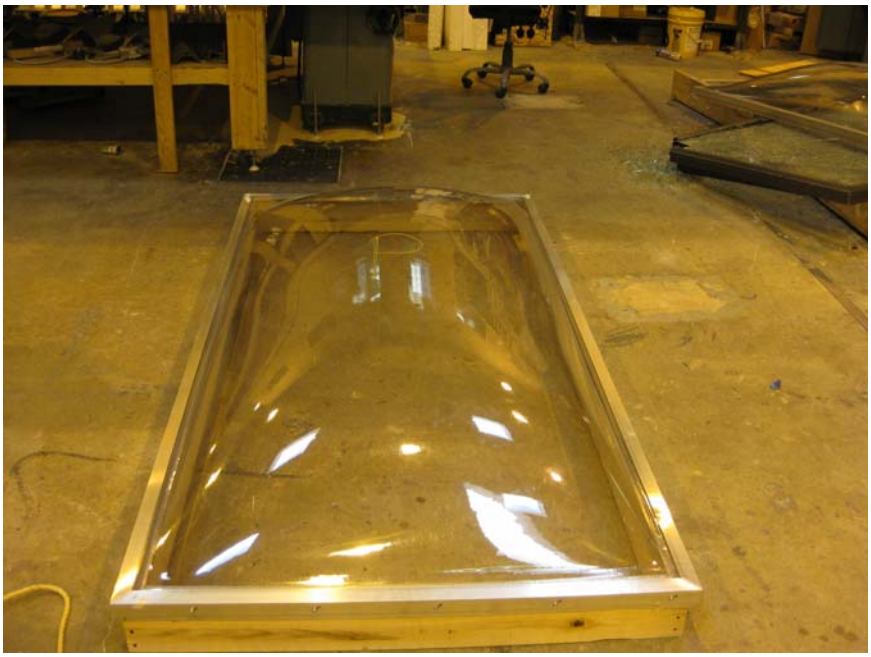
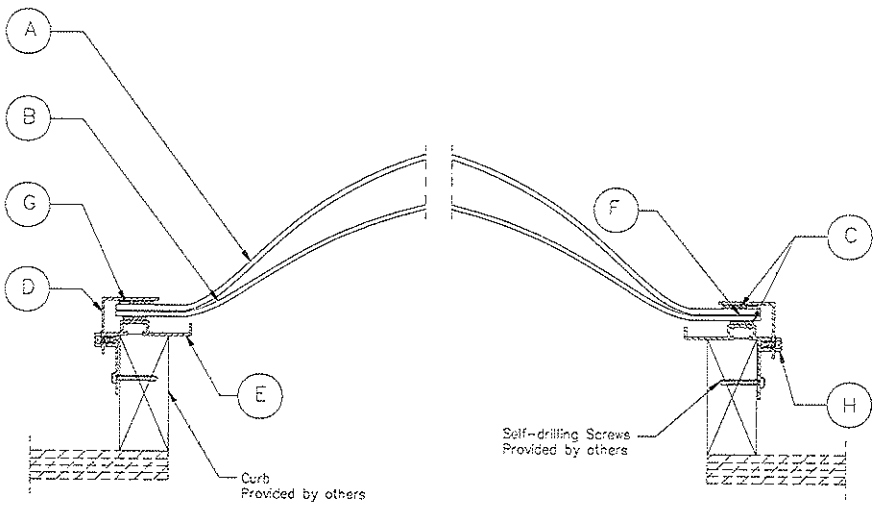


Photo No. 1
48 x 96 Polycarbonate Glazed Skylight Before Testing

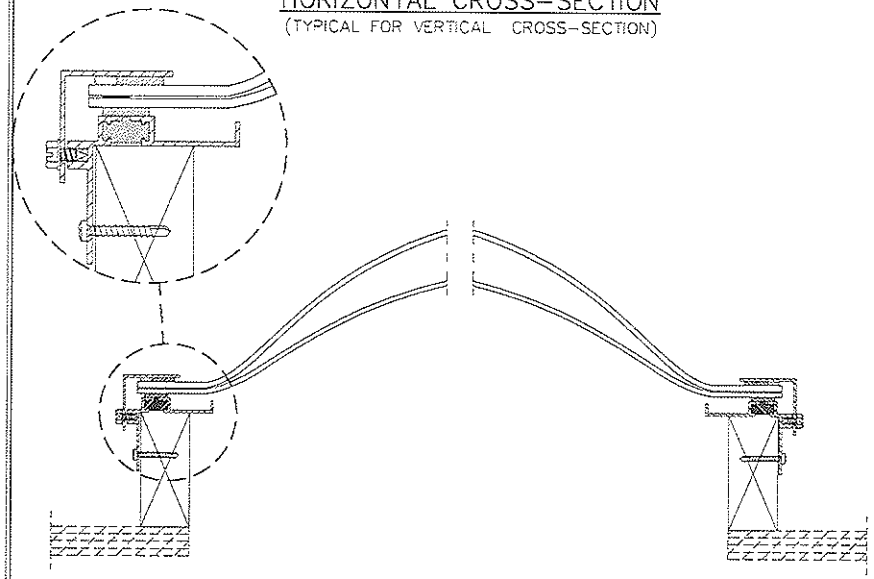
Photo No. 2
72 x 72 Polycarbonate Glazed Skylight After Testing

Appendix B

Drawing



HORIZONTAL CROSS-SECTION
(TYPICAL FOR VERTICAL CROSS-SECTION)



HORIZONTAL CROSS-SECTION (THERMALLY-BROKEN VARIANT)
(TYPICAL FOR VERTICAL CROSS-SECTION)

PART SCHEDULE

ITEM	QTY.	PART	PART NO.	DESCRIPTION	DRAWING NO. (Category / Commodity No. / Version / Edition)	COMMENTS
A	1	Outer Dome	———	Material: 309093.64 0.150" thick LEXAN	21303131330A03802	Profile and cutting Drawing
B	1	Inner Dome	———	Material: 309052.64 0.118" thick CPX acrylic	21303131840A03801	Profile and cutting Drawing
C	8	Double-sided Tape	303175			
D	1	Frame Cover	302169	Aluminum type – 6063-T5	21302169000000001	Profile drawing
					21302169000000001	Punching drawing
					21302169000D11102	Cutting and punching drawing
					21302169000C42201	Welding drawing
E	1	Inner Frame	302157	Aluminum type – 6063-T5	21302157000D17001	Punching drawing
					21302157000000002	Profile drawing
F	4	Double-sided Tape	303187	VHB – Very High Bond		
G	4	Sealant	309002	DOW 1199 or equivalent	21304394000S20202	Silicone and foam placement drawing
					21309002000064002	Material specifications

FASTENER SCHEDULE

ITEM	QUANTITY	PART	PART NO.	DESCRIPTION	DRAWING NO. (Category / Commodity No. / Version / Edition)	EXPOSED V	EXPOSED NV	COMMENTS
H	Varies	Hex Washer Head Screw	305100	#12-11 x 3/8", Type B Sheet metal screw, Finish: Clear zinc	21306100000000003	●	–	Currently used in production
	Varies	Pan Head Screw		#12-14 x 3/8", Type B Sheet metal screw, Finish: Clear zinc	21306100000000004	●	–	For future use in production

GENERAL NOTES:

A copy of this drawing plus any other supplemental documentation regarding this skylight model will be maintained at the Skylight Technical Database in the following category location – Technical Data/Submittal Data/.

Horizontal and Vertical Cross-Section part sizes, materials and assembly are identical.

V = Visible

NV = Non-Visible

Field mounting screws should be a minimum of 3/16" diameter, stainless steel, with 1" minimum embedment into the supporting curb. Use one screw in every pre-punched hole.

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Test sample complies with these details.
Deviations are noted.

Report# 89221.01-109-44

Date 2/11/09 Tech AS

VELUX
Sky-PRM . 1418 Evans Pond Road . Greenwood . South Carolina

CM-4'X4' CURB MOUNTED SKYLIGHT

POLYCARBONATE-FALL TESTING

GENERAL ASSEMBLY

Material:
Tolerance general:
Specification:
Size: B
Unspec. meam: INCHES
Scale: NTS
Checked by/drawn by/date: RLE/JDH/02.10.09
File No.:
Copy to:
DRAWING NO. Category 21 Commodity No. CM- Version Edition