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DATE OF REPORT:	November 18, 2004
LOCATION OF TEST:	Mid America Testing Laboratory
DATES OF TESTING:	April 13-November 12, 2004
PROJECT NAME:	United Skys' Series 6000 Sloped Glazed Skylight
PROJECT NUMBER:	04030L-Impact
CLIENT:	United Skys, Inc.

The following were present for all or portions of the impact and cyclic testing.

Mr. Joe Colombo	Mid America Testing Laboratory
Mr. Rick Heitmann	Mid America Testing Laboratory
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INTRODUCTION

As requested, Mid America Testing Laboratory performed impact and cycling testing on a series of United Skys' laminated glass and frame systems. This report is based on the final test specimens only.

The initial series of tests yielded results requiring the need for remediation of the system. The primary change was increasing the laminate interlayer from .090" to .100 with the final product being identified as HP.100 Hurricane Vinyl, as necessitated by the size of the glass lites.

The other remedial item dealt with modifying the glazing described creating a secondary seal the width of the laminate around the entire perimeter as described in the unit description of this document.

UNIT DESCRIPTION

Testing was conducted on three (3) Series 6000 sloped glazed skylight systems manufactured by United Skys, Inc. The units measured a nominal 4' wide x 9'-4" long and contained one lite of glass which measured a nominal 47 ¼" wide x 112" long. The glass was a nominal 1 5/16" thick

and was comprised of ¼" clear tempered glass, ½" air space and a 9/16" laminated inner lite comprised of two lites of ¼" clear heat strengthened glass with a .100" HP vinyl interlayer. The specimen was assembled and glazed at the laboratory onto a 4" x 4" tubular steel structure.

The system was captured with a standard pressure plate at the head and both rafter sections. The exterior glass joint at the purlin end was structurally sealed to the flashing with Dow Corning 791. This ¼" wide joint contained an outside line of caulk, a backer rod and an inside line of caulk which was run onto the laminate edge and extended around the entire glass. The glass was set on two 4" long setting blocks with a nominal Shore A durometer of 85. The setting blocks were located at nominal quarter points.

The typical pressure plate glazing consisted of a ¼" neoprene sponge gasket on the exterior and a dense 3/16" EPDM gasket on the interior. All pressure plates were lineal with intersecting corners being mitered and sealed with silicone. The pressure plate covers were fully cap sealed to the glass, as were the miter joints sealed with silicone.

All flashing joints were sealed with Dow Corning 791.

The unit was anchored with a combination of clip anchors and through bolts. The aluminum angles were 3" x 3" x ¼", two per rafter. They were through bolted with a 3/8" diameter x 3" long machine bolts. The clips were anchored to the framing with 3/8" x 16 x 1-1/2" self-tapping screws.

Items not specifically referenced in this brief unit description may be found in the United Skys' Impact Test Mock-Up drawing, sheet 1 of 1, Rev. September 24, 2004.

TESTING

Three samples of the size and make up referenced above were subjected to impact and differential loading testing. Tests were performed in accordance with ASTM E-1996-02 and ASTM E-1886.

1. LARGE MISSILE IMPACT

The large missile impact test incorporated a 9 pound 2" x 4" stud fired at a rate of 50 feet per second representing wind zone 4.

Each test specimen was impacted once. One skylight was hit in the center of the glass, the second skylight at the lower left corner and the third at the upper right corner.

ALLOWED: At the completion of each impact there shall be no through hole greater than 3" in diameter in the glass nor shall the tear be longer than 5".

RESULTS: For all specimens tested there was no hole larger than 3" diameter nor was there a straight-line tear greater than 5".

Once the impact testing was completed the units were installed into a pressure chamber for cyclic pressure differential loading. Loading was accomplished by means of a controlled air supply, which was connected to a capsuhelic gauge set to alarm if pressures were not maintained. The control board included an automatic counter for cycles.

2. **CYCLIC PRESSURE DIFFERENTIAL** with each of the following loads being held for not less than one (1) second and not more than five (5) seconds. Dwell time between cycles shall be no more than five (5) seconds for each of the following cycles.

Cycle	Low Pressure	High Pressure	No. of Cycles
1	+10 PSF	+25 PSF	3500
2	0 PSF	+30 PSF	300
3	+25 PSF	+40 PSF	600
4	+15 PSF	+50 PSF	100
5	–15 PSF	–50 PSF	50
6	–25 PSF	–40 PSF	1050
7	0 PSF	–30 PSF	50
8	–10 PSF	–25 PSF	3350

At the completion of the cyclic differential loading there shall be no failure in the glass creating a straight-line tear longer than 5".

SUMMARY

The United Skys' Skylights, as described in this report, have met testing criteria as outlined in ASTM E 1886 and ASTM E 1996.

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Should you have any questions regarding the test results or the mock-up in general, please feel free to contact the laboratory.

Respectfully Submitted,

MID AMERICA TESTING LABORATORY

Cindy Barrow

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