

SBCCI®

PST & ESI®

SBCCI PUBLIC SAFETY TESTING AND EVALUATION SERVICES INC.

900 Montclair Road, Suite A; Birmingham, Alabama 35213-1206

www.sbccies.org

a Participating Member of the NES, Inc.

Evaluation Reports are the opinion of the Committee on Evaluation, based on the findings, and do not constitute or imply an approval or acceptance by any local community. The Committee, in review of the data submitted, finds that in their opinion the product, material, system, or method of construction specifically identified in this report conforms with or is a suitable alternate to that specified in the Standard and International Codes.

SUBJECT TO THE LIMITATIONS IN THIS REPORT.

The Committee on Evaluation has reviewed the data submitted for compliance with the *Standard Building Code*® and the International One and Two Family Dwelling Code and submits to the Building Official or other authority having jurisdiction the following report. The Committee on Evaluation, SBCCI PST & ESI and its staff are not responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests or summaries prepared and submitted by the design professional or preparer of record that are listed in the Substantiating Data Section of this report. Portions of this report were previously included in SBCCI Evaluation Report #9751.

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REPORT NO.: 9751A

EXPIRES: See current SBCCI PST & ESI EVALUATION REPORT LISTING

CATEGORY: DOORS AND WINDOWS

SUBMITTED BY:

SOLATUBE INTERNATIONAL, INC.
2210 OAK RIDGE WAY
VISTA, CALIFORNIA 92083-8341
www.solatube.com

1. PRODUCT TRADE NAME

Solatube Skylight Assemblies:

- 1.1 10 inch Unit (250 mm) 0.118 inch thick dome
- 1.2 14 inch Unit (355 mm) 0.118 inch thick dome
- 1.3 10 inch Unit (250 mm) 0.125 inch thick dome
- 1.3 16 inch Unit (400 mm) 0.125 inch thick dome

2. SCOPE OF EVALUATION

- 2.1 Large Missile Impact under SSTD 12
- 2.2 Structural - transverse wind loads
- 2.3 Class CC 2 plastic

3. USES

Solatube Skylights are used as light-transmitting plastic skylights.

4. DESCRIPTION

4.1 General

Solatube Skylights are tubular skylight assemblies consisting of a clear polycarbonate dome with a curved reflector, reflective tubing either elbows or straight, and a ceiling light diffuser assembly. The Solatube domes are available as 10 inch (250 mm), 14 inch (355 mm) or 16 inch (400 mm) domes manufactured from G.E. Lexan® polycarbonate and classified as a Class CC 1 light-transmitting plastic.

4.1.1 Solatube, 0.125 Inch thick Domes: The 10 inch and 16 inch domes are available with a dome wall thicknesses of 0.125 inches. The 10 inch dome uses either a polypropylene flashing or an aluminum flashing. The 16 inch dome uses an aluminum flashing.

4.1.2 Solatube Skylight, 0.118 inch Thick Domes: The 10 inch and 14 inch domes are available with a dome wall thicknesses of 0.118 inches. The 10 inch dome and 14 inch domes use either a 0.125 inch thick polypropylene flashing, 0.03 inch thick Aluminized Steel flashing or 0.06 inch thick A93003 Aluminum Maganese flashing.

4.2 Large Missile Impact Resistance under SSTD 12

Solatube Skylights were tested for large missile impact resistance and cyclic pressure loadings under SSTD 12. The skylights tested passed the large missile impact test.

5. INSTALLATION

5.1 General

Solatube Skylights are installed in accordance with the manufacturer's published installation instructions and this

report. Solatube Skylights are prepackaged with all components, seals, fasteners, and installation instructions.

The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation.

The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report.

5.2 Mounting

The lowest edge of the domes shall be mounted at least 4 inches (102 mm) above the plane of the roof and the Solatube roof flashing unit made of polypropylene shall be protected by metal or other noncombustible material. The 4 inch (102 mm) curb requirement may be omitted when installed on roofs with a minimum slope of 3:12 in one and two family dwellings, or on buildings with unclassified roof coverings.

5.3 Aggregate Area

The aggregate area of skylights shall not exceed 33% of the floor area of the room or space sheltered by the roof in which the skylights are installed.

5.4 Separation

The skylights shall be separated from each other by a distance of not less than 4 feet (1219 mm) measured in a horizontal plane. In one and two family dwellings or on buildings with unclassified roof coverings, the skylights shall be separated by a distance of not less than 16 inches (407 mm) measured in a horizontal plane.

5.5 Location

Where exterior wall openings are required to be fire resistance rated, a skylight shall not be installed within 6 feet (1829 mm) of such exterior wall.

5.6 Roof Framing

Roof decking shall be minimum ½ inch (12 mm) thick wood structural panels complying with PS 2 and roof framing shall be joists or trusses spaced a maximum of 24 inches (610 mm) on center.

5.7 Fasteners

The skylight curb/flashing is attached to the wood structural panel decking with 8-#10 x 2 inch (50 mm) Dacrotized phillips truss head, SMS screws located 1 inch from edge of flashing and spaced evenly around the circumference of the curb. The dome is attached to the curb/flashing using 4-#8 x 9/16 inch (14 mm) stainless steel, phillips flat head, SMS screws located at the quarter points of the dome. The fasteners are supplied by Solatube International, Inc.

6. SUBSTANTIATING DATA

- 6.1 Manufacturer's descriptive literature, specifications, mill order certificates, installation instructions, and engineering drawings.
- 6.2 Engineering calculations, W.W. Schaefer Engineering & Consulting, P.A. signed and sealed by Warren W. Schaefer, P.E.;
 - 6.2.1 Structural analysis of 10 inch (250 mm) and 16 inch (400 mm) Solatube Skylights, roof decking and roof framing, January 30, 1997,
 - 6.2.2 Structural analysis of Solatube 10" & 14" Skylights with 0.118 inch thick domes (For applications on 5/8" CDX Plywood Sheathing), May 22, 2000.
- 6.3 Test reports, large missile impact under SSTD 12, Hurricane Test Laboratory, Inc., signed by Vinu J. Abraham, E.I.T.
 - 6.3.1 Job #0114-1212-96;
 - Specimen #1, 10 in. Solatube with Polypropylene Flashing, 12/19/96.
 - Specimen #2, 16 in. Solatube with Aluminum Curb, 12/19/96.
 - Specimen #3, 10 in. Solatube with Aluminum Curb, 12/19/96.
 - Specimen #4, 16 in. Solatube Skylight with Aluminum Curb, 01/13/97
 - JRT.2 Job #0114-0609-97;
 - Specimen #2, 10 in Solatube with Aluminum Curb, 06/13/97.
 - Specimen #3, 16 in Solatube Skylight with Aluminum Curb, 06/16/97.
- 6.4 Test reports, cyclic load test under SSTD 12, Hurricane Test Laboratory, Inc., signed by Vinu J. Abraham, E.I.T.
 - 6.4.1 Job #0114-1212-96;
 - Specimen #1, 10 in. Solatube with Polypropylene Flashing, 12/31/96.
 - Specimen #2, 16 in. Solatube with Aluminum Curb, 12/31/96.
 - Specimen #3, 10 in. Solatube with Aluminum Curb, 12/31/96.
 - Specimen #4, 16 in. Solatube Skylight with Aluminum Curb, 01/13/97.
 - 6.4.2 Job #0114-0509-97;
 - Specimen #2, 10 in Solatube with Aluminum Curb, 06/16/97.
 - Specimen #3, 16 in Solatube Skylight with Aluminum Curb, 06/16/97.
- 6.5 Tests reports demonstrating dome material is a CC 1 plastic, SGS U.S. Testing Company Inc., signed by Brian Ortega and Michael S. Elliott:
 - Rate of burning ASTM D 635, Report 720421-4, 4/1/97.
 - Ignition properties ASTM D 1929, Report 720421-5, 4/1/97.
 - Smoke Density ASTM D 2843, Report 720421-6, 4/1/97.

- 6.6 Test report on weathering ASTM G 23, 2000 hours Carbon-Arc, SGS U.S. Testing Company Inc., Report 720421-3, 04/21/97, signed by Larry Burmer and David Pereg.
- 6.7 Test report demonstrating that diffusers are CC 2 plastic, American Research and Testing Incorporated, Number 93127, October 18, 1993, signed by B. Belmont and Rita R. Boggs, Ph.D.
- 6.8 Test report weathering of flashing 2000 hours xenon weatherometer, American Research and Testing Incorporated, Number 93124-2, January 25, 1994, signed by B. Belmont and Rita R. Boggs, Ph.D.
- 6.9 Test reports, large missile impact and cyclic load test under SSTD 12, Hurricane Test Laboratory, Inc., Job #0220-0205-0, signed and sealed by Vinu J. Abraham, P.E. 5/31/00:
- 6.9.1 Solatube 10 inch dome skylight, 0.118 inch thickness, large missile impact and cyclic load test under SSTD 12:
- Specimen #3, 02/21/00, 4 inch high Flat Metal Curb Flashing.
 - Specimen #4, 02/22/00, 4 inch high Flat Metal Curb Flashing.
 - Specimen #6, 02/24/00, 4 inch high Flat Metal Curb Flashing.
 - Specimen #7, 03/09/00, Polypropylene Curb Flashing.
 - Specimen #8, 03/06/00, 7.50 inch high Roof Tile Metal Curb.
 - Specimen #9, 03/07/00, pitched Aluminized Steel Curb Flashing with a pitch of 22.5°.
 - Specimen #12, 03/13/00, pitched Aluminized Steel Curb Flashing with a pitch of 22.5°.
 - Specimen #14, 03/09/00, 7.50 inch high Roof Tile Metal Curb.
- 6.9.2 Solatube 14 inch dome skylight, 0.118 inch thickness, large missile impact and cyclic load test under SSTD 12:
- Specimen #10, 02/24/00, 6 inch high Flat Metal Curb Flashing.
 - Specimen #11, 02/24/00, 6 inch high Flat Metal Curb Flashing.
 - Specimen #13, 03/07/00, 6 inch high Flat Metal Curb Flashing.
 - Specimen #2, 02/21/00, 4 inch high Flat Metal Curb Flashing.
 - Specimen #5, 02/22/00, 4 inch high Flat Metal Curb Flashing.
- 6.9.3 Solatube 10 inch dome skylight, 0.118 inch thickness, static load tests under ASTM E 330, air infiltration test under ASTM E 283, water infiltration test under ASTM E 331:
- Specimen #7, 03/04/00, Polypropylene Curb Flashing.
 - Specimen #8, 02/25/00, 7.50 inch high Roof Tile Metal Curb Flashing.
 - Specimen #9, 03/04/00, pitched Aluminized Steel Curb Flashing with a pitch of 22.5°.
- 6.9.4 Solatube 14 inch dome skylight, 0.118 inch thickness, static load tests under ASTM E 330, air infiltration test under ASTM E 283, water infiltration test under ASTM E 331:
- Specimen #1, 02/17/00, 6 inch high Flat Metal Curb Flashing.
- 6.10 Engineering drawings for 10" & 14" Dome Skylights, 0.118 inch thickness, Solatube International, Inc., prepared by W. W. Schaefer Engineering & Consulting, P.A., Drawing No. 1009, sheets 1 through 8, 05/14/00, signed and sealed by Warren W. Schaefer, P.E., Aug 23, 2000.

7. CODE REFERENCES

Standard Building Code® - 1999 Edition

Section 103.7	Alternate Materials and Methods
Section 202	Definitions - Plastic, Approved
Chapter 16	Structural Loads
Section 2405.3	Wind, Snow and Dead and Impact Loads
Section 2407	Sloped Glazing
Section 2604	Light-transmitting Plastics
Section 2604.6	Skylights - Plastics
Section 2604.7	Light-Diffusers in Ceilings

International One and Two Family Dwelling Code - 1998 Edition

Section 108	Alternate Materials and Systems
Section 301	Design Criteria
Section 308.6	Skylights and Sloped Glazing

8. COMMITTEE FINDINGS

The Committee on Evaluation in review of the data submitted finds that, in their opinion, the Solatube Skylights as described in this report conform with or are suitable alternates to that specified in the *Standard Building Code*® and the International One and Two Family Dwelling Code or Supplements thereto.

9. LIMITATIONS

- 9.1 This Evaluation Report and the installation instructions, when required by the building official, shall be submitted at the time of permit application.
- 9.2 Solatube Skylights shall not be used in fire resistance rated roof ceiling assemblies unless test reports from an approved testing laboratory are submitted to the building official.
- 9.3 Solatube Skylights shall not be installed on roofs where the maximum design positive or negative load exceeds 80 psf (3840 Pa).
- 9.4 The structural elements supporting the skylights shall be designed for the maximum design load of 80 psf (3840 Pa) positive and negative. The calculations

shall be submitted to the building official and shall be signed, sealed, and dated when required by the *Code*.

- 9.5 The Solatube Skylight reflective tubing shall not pass through a plenum.

10. IDENTIFICATION

Each package of components used for assembly of Solatube skylights covered by this report shall be labeled with the manufacturer's name and/or trademark, the SBCCI Public Safety Testing and Evaluation Services Inc. Seal or initials (SBCCI PST & ESI), and the number of this report for field identification.

The skylights shall also be labeled in accordance with Section 102 of SSTD 12.

11. PERIOD OF ISSUANCE

SEE CURRENT SBCCI PST & ESI EVALUATION REPORT LISTING FOR STATUS OF THIS EVALUATION REPORT.

For information on this report contact:
Michael P. O'Reardon, P.E.
205/599-9800
moreardon@sbccies.org