



**FALL RESISTANCE TEST REPORT**

**Rendered to:**

**VELUX America LLC**

**SERIES/MODEL: VS S06 2004**

**PRODUCT TYPE: Venting Deck Mounted Skylight**

**Report No: 96236.02-109-44**

**Test Date: 03/15/10**

**Report Date: 05/03/18**

**Expiration Date: 03/15/14**



## **FALL RESISTANCE TEST REPORT**

Rendered to:

VELUX America LLC  
P.O. Box 5001  
Greenwood, South Carolina 29648-5001

Report No: 96236.02-109-44  
Test Date: 03/15/10  
Report Date: 05/03/18  
Expiration Date: 03/15/14

**Project Summary:** Architectural Testing, Inc. was contracted by VELUX America LLC to perform testing on a Series/Model VS S06 2004, venting deck mounted skylight. The test specimen description and results are reported herein. The test sample was provided by the client.

**Test Specification:** The test specimen was tested to assess compliance with prior 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 unit for a minimum of 60 seconds and then dropped from increasing heights above the skylight starting at 2' until permanent visible damage was noted. All impact load drops were noted and the resulting damage was recorded.

### **NEW EVALUATION SCOPE:**

- A. Intertek Building & Construction (B&C) was contracted by VELUX America LLC, 1418 Evans Pond Road on December 4, 2017 to evaluate the OSHA fall protection testing to the most recent referenced document. Occupational Safety and Health Administration (OSHA)/U.S. Department of Labor Regulations Standard 29 CFR §1910.29 – Fall protection systems and falling object protection-criteria and practices. Section 1910.29(e)(1) requires a cover to be capable of supporting without failure at least twice the maximum intended load that may be imposed on the cover at any one time.
- B. Intertek Building & Construction (B&C) was contracted by VELUX America LLC, 1418 Evans Pond Road on December 4, 2017 to evaluate the Cal/OSHA fall protection testing to the most recent referenced document. California Code of Regulations, Title 8, Section 3212 §(b), which states, "covers shall be capable of safely supporting the greater of 400 lbs or twice the weight of the employees, equipment and materials that may be imposed on any one square foot area of the cover at any time."

**Test Specimen Description:****Series/Model:** VS S06 2004**Product Type:** Venting Deck Mounted Skylight**Overall Size:** 44-1/4" wide by 45-3/4" long**Fixed Daylight Opening Size:** 40-3/4" by 42-1/4"**Overall Area:** 14.13 ft<sup>2</sup>**Finish:** All wood and aluminum were painted.

**Frame Construction:** All frame members were constructed of wood with mortise joint corner construction, secured with one 1-3/4" long nail. A steel mounting flange was utilized around the exterior perimeter of the frame. The flange was secured to the frame using 3/8" long "T" nails. An extruded aluminum hinge was utilized on the head and was secured using #8 x 1" long Phillips pan head screws. The hinge utilized 5" long molded ASA corner keys.

**Sash Construction:** The sash frame members were constructed of wood with mortise joint corner construction and were secured using one 5/16" by 1/2" crown staple. An extruded aluminum hinge was utilized on the head and was secured using #8 x 1" long Phillips pan head screws. A snap-in roll-formed aluminum cover was utilized on all sides of the sash.

**Weatherstripping:**

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
3/8" diameter Kerf-mounted hollow EPDM bulb	1 Row	Frame, head, and jambs
Custom shaped EPDM glazing gasket	1 Row	Sash, all members
Custom TPE frame to sash gasket	1 Row	Frame, sill, and jambs
Custom molded EPDM gasket	1 Row	Frame, sill

**Test Specimen Description:** (Continued)

**Glazing Details:** The sash was glazed with 17.6 mm (0.693") thick insulating glass, constructed from a sheet of 3 mm (1/8") thick clear tempered glass outboard, a sheet of 5.8 mm (7/32") thick laminated glass inboard, and a stainless steel box spacer system. The laminated glass was constructed from two sheets of 2.5 mm (3/32") thick clear heat-strengthened glass and a 0.030" thick PVB interlayer. The glass was exterior glazed against a custom shaped EPDM glazing gasket and was secured with roll-formed aluminum profiles with silicone against the glass. The top glazing profiles were secured to the frame with #8 x 1-1/4" long pan head screws.

**Hardware:**

<u>Description</u>	<u>Quantity</u>	<u>Location</u>
Metal rotary operator with manual chain drive	1	Midspan of frame sill
Extruded aluminum hinge	1	Full length of frame and sash heads

**Reinforcement:** No reinforcement was utilized.

**Screen Construction:** All screen members were constructed of roll-formed aluminum with corners square-cut and secured using an outside plastic corner key. The fiberglass mesh was secured to the frame using a flexible vinyl spline.

**Installation:** The unit was installed into a Spruce-Pine-Fir wood buck with a rough opening frame using 2x4 lumber. Nominal 1/2" thick plywood sheathing was secured to the buck frame and the rough opening using #8 x 1-5/8" drywall screws. The flange was secured using 1-1/4" long, 1/8" shank diameter, 3/8" diameter head ring-shank nails, (supplied by the manufacturer) located 3" from each end and spaced about 9" on center. The test specimen was installed in accordance with the installation instructions provided by the manufacturer.

**Test Results:** The results are tabulated as follows:

<u>Method</u>	<u>Load Location</u>	<u>Results</u>
200 lbf at rest	Center of glass	No visible damage See Note #1
400 lbf-ft (2' drop height)	Center of glass	No visible damage
800 lbf-ft (4' drop height)	Center of glass	No visible damage
1200 lbf-ft (6' drop height)	Center of glass	No visible damage
1600 lbf-ft (8' drop height)	Center of glass	No visible damage
2000 lbf-ft (10' drop height)	Center of glass	See Note #2
2400 lbf-ft (12' drop height)	Center of glass	See Note #3

**General Note:** *The test specimen was supported at the head and tested at a 14° slope (Reference Photo #1).*

**Note #1:** *The 200 lbf weight was gently applied perpendicular to the center of the skylight. After 60 seconds of rest time, there was no visible damage to the skylight.*

**Note #2:** *At the 10' drop height, the bag broke the exterior tempered glass and fractured interior laminate.*

**Note #3:** *At the 12' drop height, the interior laminate deglazed in multiple locations.*

#### **CONCLUSION:**

The specimen was evaluated in accordance with Occupational Safety and Health Administration (OSHA)/U.S. Department of Labor Regulations Standard 29 CFR §1910.29(e)(1) and with California Code of Regulations, Title 8, Section 3212 §, and found to be capable of resisting several drops of a 200 lb. weight bag, the highest of which was dropped from 8 feet resulting in resistance without visible damage to 1,600 ft-lbs of energy.

Detailed drawings, 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 and the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. 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:

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Eric M. Brennan  
Project Manager

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Timothy J. McGill  
Manager – Product Testing

EMB:vlm/abo

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Photographs (2)

Appendix-B: Drawings (2)

### Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	05/03/18	N/A	Original report issue

This report produced from controlled document template ATI 00205, issued 03/05/09.

**Appendix A**  
**Photographs**



**Photo No. 1**  
**Test Set-up**



**Photo No. 2**  
**Test Set-up and 200 lbf Bag**





**Photo No. 3**  
**Result from 10' Drop Height**

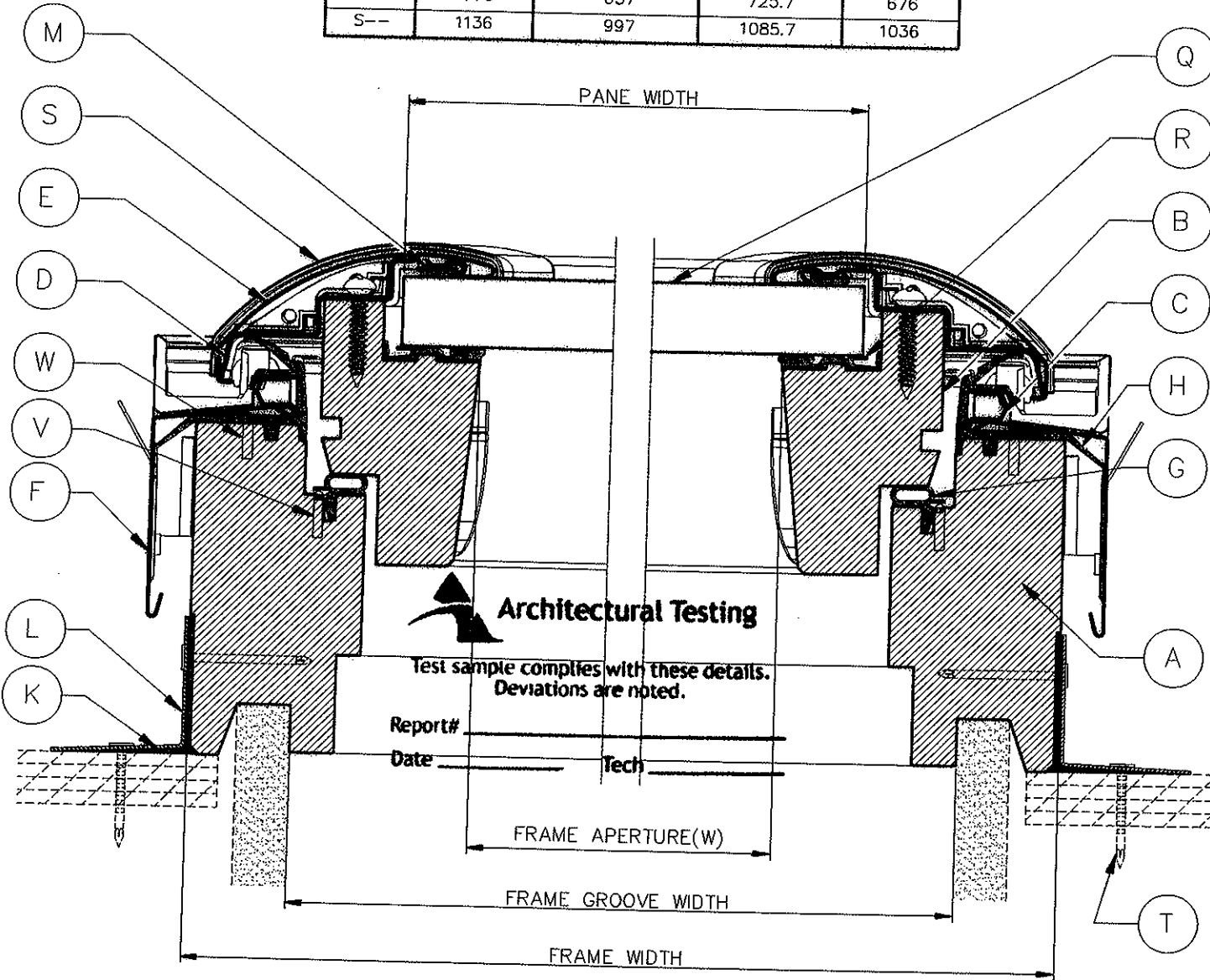


**Photo No. 4**  
**Result from 12' Drop Height**

## **Appendix B**

### **Drawings**

Size	Frame width	Frame aperture W	Frame groove width	Pane width
A--	387	248	336.7	287
C--	546	407	495.7	446
M--	776	637	725.7	676
S--	1136	997	1085.7	1036



Item T Quantities Nail			Item U Quantities Staple			Item V Quantities Staple			Item W Quantities Staple			Item X Quantities Staple		
Size Code	Fasteners		Size Code	Fasteners		Size Code	Fasteners		Size Code	Fasteners		Size Code	Fasteners	
	VS	VSE		VS	VSE		VS	VSE		VS	VSE		VS	VSE
A06	16	--	A06	2	--	A06	20	--	A06	55	--	A06	N/A	N/A
C01	14	14	C01	2	2	C01	21	19	C01	47	27	C01	N/A	2
C04	16	16	C04	2	2	C04	21	19	C04	59	31	C04	N/A	2
C06	18	18	C06	2	2	C06	23	21	C06	63	35	C06	N/A	2
C08	20	20	C08	2	2	C08	23	21	C08	71	39	C08	N/A	2
M04	18	18	M04	2	2	M04	21	21	M04	59	33	M04	N/A	2
M06	20	20	M06	2	2	M06	23	23	M06	57	37	M06	N/A	2
M08	22	22	M08	2	2	M08	23	23	M08	75	41	M08	N/A	2
S01	18	18	S01	2	2	S01	24	24	S01	55	32	S01	N/A	2
S06	22	22	S06	2	2	S06	26	26	S06	72	40	S06	N/A	2

PART / COMPONENT SCHEDULE							
ITEM	QTY	PART/COMPONENT	COMPONENT NO.	DESCRIPTION	DRAWING NO.		COMMENTS
					Part	Company	
A	2	Side frame	300145LXX	Left side frame	21300151	A001502	Mortising and moulding drawing
			300145RXX	Right side frame	21304505	0A01702	Drilling
B	2	Side sash	300155LXX	Left side sash	21300161	DDA1502	Mortising and moulding drawing
			300155RXX	Right side sash	21302205	00A3102	Profile and cutting drawing
C	2	GSP rail	302205XX	0.65mm thick, Type IIB, 3105-H32 Kynar Cool Grey paint on 1 side (outside)	21302206	0000001	Finish: Two sided wash coat
D	2	Glazing profile	302207XX	.8mm Thick 5052-H32 Aluminum	21302207	A000001	Punching
E	2	Covering	302210	.65mm Thick 3105-H32 Aluminum Kynar Cool Grey paint on 1 side (outside)	21302209	0A00001	Profile
F	3	Side & Bottom Frame covering	302213L(Left)	0.65mm thick, Type IIB, 3105-H32 Kynar Cool Grey paint on 1 side (outside)	21302213	0000001	Profile drawing
			302213R(Right)		21302213	0A003201	Shearing and embossing drawing
G	2	Frame gasket	303378	EPDM 64 shore A	21303378	0A00004	TSFA gasket (top, side frame)
H	2	FTSA gasket	303379	TPE/Color: Black	21303379	0000002	Commodity drawing
I	-	Foam (Not shown)	303420	Closed cell PVC foam with PSA Color: black	21303420	0000001	Commodity drawing
J	-	Foam plug-VSE only (Not shown)	303421	4# Polyethylene foam, charcoal color	21303421	0A00002	Foam plug (for rain sensor hole)
K	1	Foam, Deck seal	303385	Closed cell PVC foam with PSA Color: black	21303385	0000002	Commodity drawing (Not in BOM's, applied by supplier)
L	1	Deck seal	302203XXX	ASTM 1011 CS Type B 0.033" thk	21302203	0000007	Commodity drawing
M	1	Sealant	305568	Hot applied silicone	21304520	00004301	Silicone placement drawing
N	1	Side hole plug (Not shown)	306144	Copolymer polypropylene, Color: NCS S-7500-N (grey)	21306144	0000004	Side cover hole plug for bottom, Commodity drawing
O	1	Plug for CAP hole (Not shown)	308031	ASA-Luran S 778T or equivalent color: NCS S 0500-N (White)	21308031	0000003	Commodity drawing
P	-	Glazing clip (Not shown)	308033	Acetal, color: Pantone #430	21308033	0000002	Commodity drawing
Q	1	Pane	N/A	Panes and spacer bars	21304541	0A061xx	Typical arrangement of panes and spacer bars
R	2	FSS gasket	303376	EPDM 64 shore A	21303376	A000002	FS/VS, FSS gasket, Profile
S	2	Sash corner key	303400	ASA-Luran S 778T or equivalent color: NCS S-7500-N (grey)	21303400	0000003	VS/E, Sash corner key

FASTENER SCHEDULE						
ITEM	PART/COMPONENT	COMPONENT NO.	DESCRIPTION	DRAWING NO.		COMMENTS
				Part	Company	
T	Nail	306165	1 1/4"x.095 double hot dip galvanized nail			Attach deck seal
U	Staple (Not shown)	306011	0.9x0.7x4.6x10mm, SS			Staple name plate
V	Staple	306012	1.2x0.9x8.8x10mm, SS			Staple Frame gasket, sash gaskets
W	Staple	306014	18 5/8" SS DIV POINT			Staple @ Frame gasket & FTSA gasket
X	Staple (Not shown)	306015	8x19mm GSI FE/ZN	21306015	0000004	Staple (Sash frame staple @ bottom corners)

**GENERAL NOTES:**  
1. Size Code reference A06 is offered for the VS model skylight, only.  
2. Reference Drawings include 21.-----XX-- for "VS/E List of Parts". (PROPRIETARY), 21.VSEVER.000.61.XX for "VS/VSE. Product Certification, Typical Vertical Arrangement with List of Components".  
3. Dimensions and Quantities shown on this drawing are for Standard Size VS/VSE model skylights.

**Architectural Testing**  
Client \_\_\_\_\_  
Report # 96236  
Date 3/23/10  
Tech EB



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DIMENSIONS ARE IN MM  
ANGULAR TOLERANCES:  
ANGULAR: ±1  
ONE PLACE DECIMAL: ±0.5

NOTE:  
SKY-PRM  
1418 Evans Pond Road PO Box 5001  
Greenwood, South Carolina 29648-5001

**VELUX**  
VS/VSE  
Product Certification  
Typical Horizontal Arrangement with  
List of Components

SIZE: 21.VSEHOR.000.61.XX  
REV: 1.1  
DATE: 7/26/09  
SHEET 1 OF 2



Item SS Quantities Nail		
Size Code	VS	VSE
A06	4	N/A
C01	4	4
C04	4	4
C06	4	4
C08	4	4
M04	4	4
M06	4	4
M08	4	4
S01	4	4
S06	4	4

Item TT Quantities Screw		
Size Code	VS	VSE
A06	17	N/A
C01	15	15
C04	15	15
C06	15	15
C08	15	15
M04	20	20
M06	20	20
M08	20	20
S01	19	19
S06	21	21

Item UU Quantities Screw		
Size Code	VS	VSE
A06	4	N/A
C01	4	4
C04	4	4
C06	4	4
C08	4	4
M04	4	4
M06	4	4
M08	4	4
S01	4	4
S06	4	4

Item WW Quantities Wood screw		
Size Code	VS	VSE
A06	4	N/A
C01	4	3
C04	4	3
C06	4	3
C08	4	3
M04	4	3
M06	4	3
M08	4	3
S01	4	3
S06	4	3

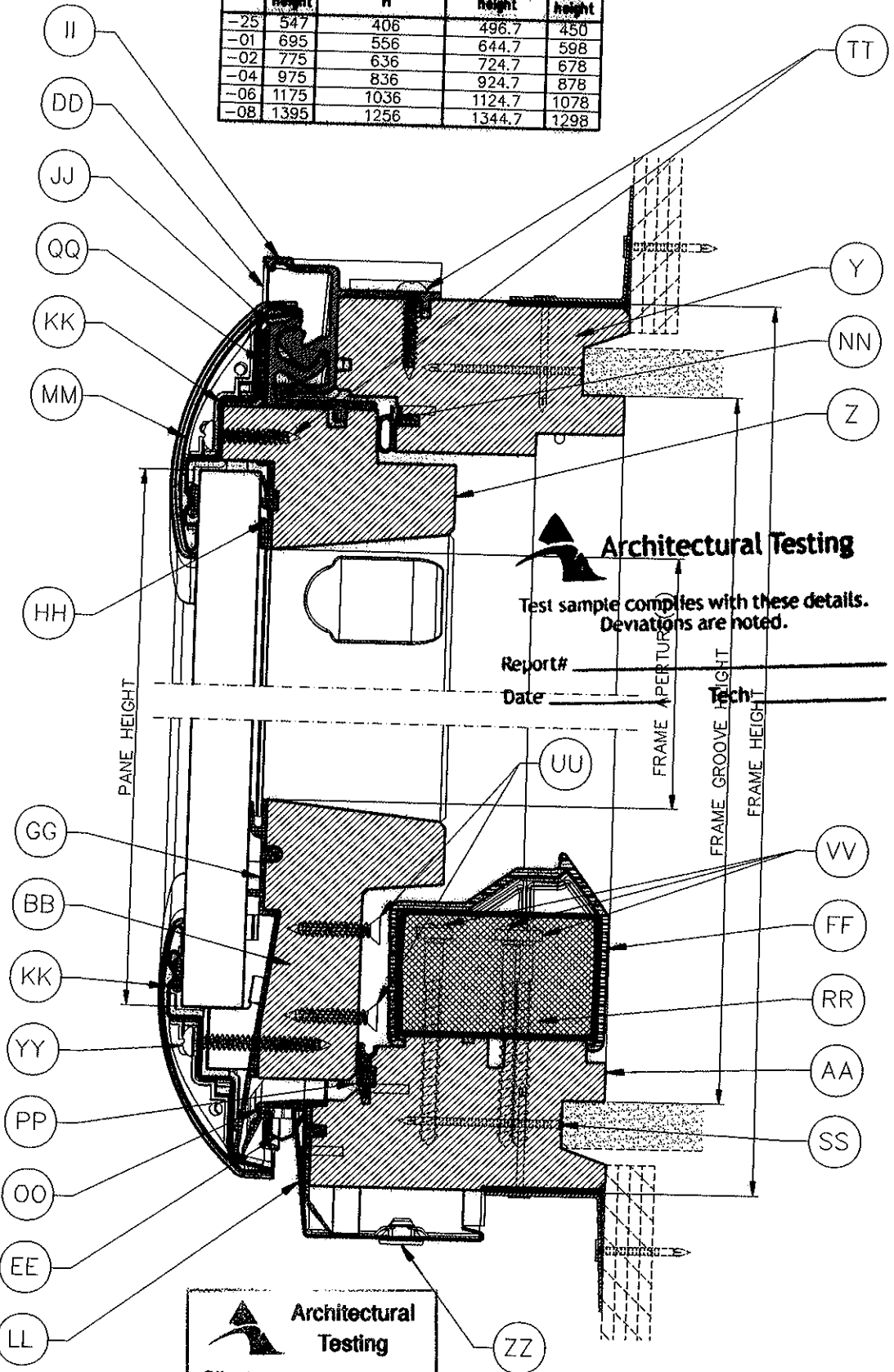
Size	Frame height	Frame aperture H	Frame groove height	Pane height
-2S	547	406	496.7	450
-01	695	556	644.7	598
-02	775	636	724.7	678
-04	975	836	924.7	878
-06	1175	1036	1124.7	1078
-08	1395	1256	1344.7	1298

Item VV Quantities Screw		
Size Code	VS	VSE
A06	N/A	N/A
C01	N/A	4
C04	N/A	4
C06	N/A	4
C08	N/A	4
M04	N/A	4
M06	N/A	4
M08	N/A	4
S01	N/A	4
S06	N/A	4

Item XX Quantities Staple		
Size Code	VS	VSE
A06	2	N/A
C01	2	2
C04	2	2
C06	2	2
C08	2	2
M04	2	2
M06	2	2
M08	2	2
S01	2	2
S06	2	2

Item YY Quantities Screw		
Size Code	VS	VSE
A06	2	N/A
C01	3	3
C04	3	3
C06	3	3
C08	3	3
M04	3	3
M06	3	3
M08	3	3
S01	4	4
S06	4	4

Item ZZ Quantities Plug		
Size Code	VS	VSE
A06	2	2
C01	2	2
C04	2	2
C06	2	2
C08	2	2
M04	2	2
M06	2	2
M08	2	2
S01	2	2
S06	2	2



**Architectural Testing**

Client \_\_\_\_\_  
 Report # 96236  
 Date 3/23/10  
 Tech EB

ITEM QTY.	PART/COMPONENT	COMPONENT NO.	DESCRIPTION	DRAWING NO.		COMMENTS
				2130014900A1502	2130015900A1501	
Y 1	Top frame	300143X	Top frame, moulded, treated & painted	2130014900A1502		Mortising and moulding drawing
Z 1	Top sash	300153X	Top sash moulded, treated, painted	2130015900A1501		Mortising and moulding drawing
AA 1	Bottom frame	300180X(VS)	Bottom frame drilled, treated, painted	2130015000A1502		Mortising and moulding drawing
		300181X(VSE)		2130015000A1701		
BB 1	Bottom sash	300154X	Bottom sash moulded, treated, painted	2130016000A1501		Mortising and moulding drawing
CC 1	Hinge corner key	303398L	Hinge corner key - left (Not Shown)	2130016000A1702		Bottom sash, Drilling, Commodity drawing
DD 1	Hinge corner key	303398R	Hinge corner key - right	21303398000000201		Hinge corner key, Silicone placement
EE 1	GSP rail	302205	0.65mm thick, Type IIB, 3105-H32	2130220500A3102		Profile and cutting drawing
FF 1	Operator cover	303389X(VS)	ABS with ASA coating Color: White	21303388000000002		Profile drawing (VS/VSE)
		303390X(VSE)		2130339000A3104		
GG 1	BSGA gasket	303393X	BSGA glazing gasket, S	21303393000000003		Commodity drawing
HH 1	TGS gasket	303377	FS/VS/VSE, TGS gasket	2130337700A000002		Profile
II 1	Frame Hinge	308028	Frame hinge, lineal, 12'	21308028000000001		Profile drawing
				2130802800A1704		
JJ 1	Sash Hinge	308030	Sash bar hinge, lineal, 12'	21308030000000001		Profile drawing
				2130803000A1704		
KK 1	Glazing profile	302206X	.8mm thick 5052-H32 Aluminum Top/bottom glazing profile	21302206000000001		Glazing profile
				2130220600A000001		
LL 1	Frame cover	302212X	Bottom frame cover	2130221200A3403		Punching and Bending drawing
MM 1	Covering	302209X	Covering top/bottom sash covering	2130220900A000001		Profile
NN 1	TSFA Frame gasket	303378	EPDM 64 shore A	2130337800A000004		Profile, TSFA gasket (top, side frame)
OO 1	FTSA gasket	303379xx	FTSA Gasket TPE gasket	21303379000000002		Commodity drawing
				2130337900A4201		
PP 1	Bottom frame gasket	303397	EPDM 64 shore A	2130339700A000002		Profile, BFA gasket (bottom frame gasket)
QQ 1	Foam, Sash hinge	303428	Closed cell PVC foam with PSA Color:black			
RR 1	Operator	863765(VSE) 307356(VS)	Operator for opening and closing			Manual for VS / Electric for VSE
AA 1	Chain attachment (Not shown)	308032	Base plate	2130803200A000001		Commodity drawing

ITEM	PART/COMPONENT	COMPONENT NO.	DESCRIPTION	DRAWING NO.		COMMENTS
				21306005100000006	21306025000000111	
SS	Nail	421002	1 3/4x0.083 Coil screw	21306005100000006		Nail @ wood frame corners
TT	Screw	306071	#8-15x1 PH, PHIL, SS, PVC	21306005100000006		● Attach Frame hinge & Glazing profiles
UU	Screw	306117	#8x1" CS, SS	21306025000000111		Chain attachment plate
VV	Wood screw	306142	10-13x2-1/4 PHIL PH Wood screw 18-8 SS	21306142000000002		Attach Operator
WW	Screw - VSE only (Not shown)	833407	3x20 DELTA PT hex5, PH2/Lstot FZB			Gear box covers
XX	Staple (Not shown)	306156	8.7x38mm GSI FE/ZN	21306015000000004		Sash frame staple @ top corners
YY	Screw	306143	#8-15x 1 1/2" PVC, SS			Attach Bottom glazing profile
ZZ	Plug	306144	Copolymer polypropylene	21306144000000004		● Side cover hole plug for bottom

**GENERAL NOTES:**

- Size Code reference A06 is offered for the VS model skylight, only.
- Reference Drawings include 21-...-XX-... for "VS/E List of Parts". (PROPRIETARY), 21.VSEHOR.000.61.XX for "VS/VSE. Product Certification, Typical Horizontal Arrangement with List of Components".
- Dimensions and Quantities shown on this drawing are for Standard Size VS/VSE model skylights.



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NOTE: DIMENSIONS ARE IN MM GENERAL TOLERANCES ANGULAR: ±1 ONE PLACE DECIMAL: ±0.5

SCALE: 1:1

DATE: 7/30/09

SHEET 2 OF 2

VELUX SKY-PRM 1418 Evans Pond Road PO Box 5001 Greenwood, South Carolina 29648-5001

VS/VSE Product Certification Typical Vertical Arrangement with List of Components