

HTL

Compliance Test Report



FLORIDA GEORGIA TEXAS
HTLTEST.COM

Acurlite Structural Skylights, Inc.

1017 North Vine Street, P.O. Box 5

Berwick, PA 18603

"Secure Series", Large Missile

Specimens 1A, 5, 6, & 7

HTL Report #: 0541-0418-09



CORPORATE HEADQUARTERS

6655 Garden Road
Riviera Beach, Florida 33404
HTLTEST.COM
P: 888.477.2454
F: 561.881.0075

12/14/2009

Keith Mazzie
Acurlite Structural Skylights, Inc.
1017 North Vine Street, P.O. Box 5
Berwick, PA 18603

Re: Secure Series, Large Missile, Specimens 1A, 5, 6, & 7

Dear Mr. Mazzie:

Enclosed you will find the test report package for the Secure Series, Large Missile, Specimens 1A, 5, 6, & 7 tests that were performed at Hurricane Test Laboratory, LLC (HTL).

This test report package includes the following items:

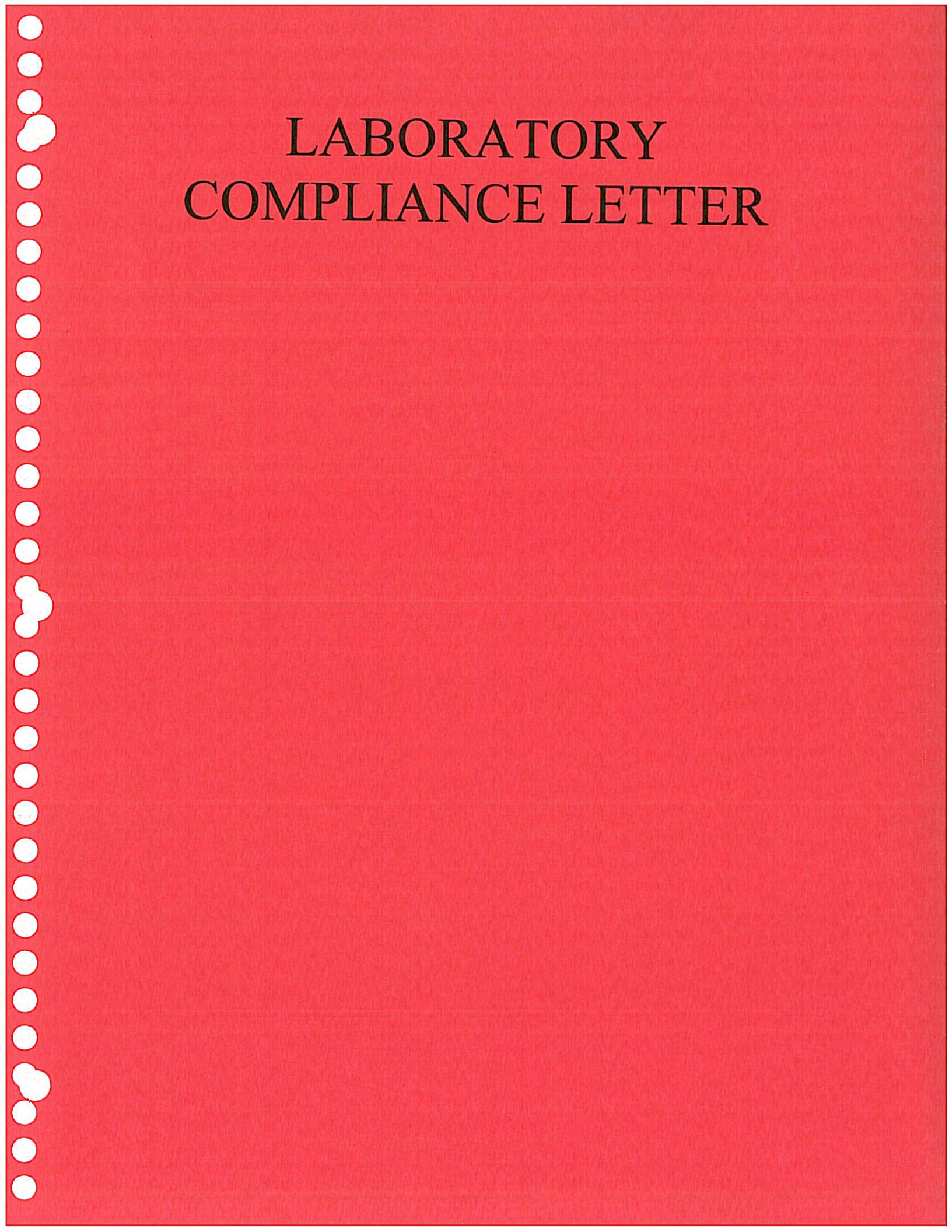
- Laboratory compliance letter
- HTL test report # 0541-0418-09 (16 pages)
- Acurlite Structural Skylights, Inc. drawing labeled large Missile Testing (12 sheets)

If you have any questions, please contact our office.

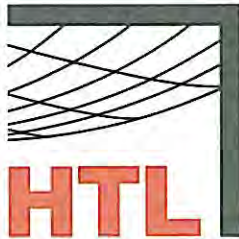
Sincerely,

HURRICANE TEST LABORATORY, LLC

Vinu J. Abraham, P.E.
FL Reg. # 53820



LABORATORY COMPLIANCE LETTER

**CORPORATE HEADQUARTERS**

6655 Garden Road
Riviera Beach, Florida 33404
HTLTEST.COM
P: 888.477.2454
F: 561.881.0075

12/14/2009

Jaime D. Gascon
Miami-Dade Building Code Compliance Office
Metro-Dade Flagler Building, Suite 1603
140 West Flagler Street
Miami, Florida 33130-1563

Re: Laboratory Compliance Letter (HTL09035)

Dear Mr. Gascon:

The tests described in the reports for the below jobs and specimen numbers have been performed in full accordance of the requirements of the Florida Building Code, with no deviations.

Job #	Specimen #	TAS 201	TAS 203	TAS 202		
				AIR	WATER	STATIC
0541-0418-09	1A			X	X	X
	5	X	X			
	6	X	X			
	7	X	X			

If you have any questions, please contact our office.

Sincerely,

HURRICANE TEST LABORATORY, LLC

Vinu J. Abraham, P.E.
FL Reg. # 53820

TEST REPORT



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CORPORATE OFFICE
6655 Garden Road
Riviera Beach, FL 33404
561.881.0020
HTLTEST.COM

Test Report #: 0541-0418-09
Report Expiration: 12/14/2014
Specimen #: 1A, 5, 6, & 7
Page: 1 of 16

Acurlite Structural Skylights, Inc.
Secure Series, Large Missile
Test Report #: 0541-0418-09

1.0 MANUFACTURER'S IDENTIFICATION

- 1.1 Name of Applicant: Acurlite Structural Skylights, Inc.
1017 North Vine Street, P.O. Box 5
Berwick, PA 18603
Voice: 570.759.6882
Fax: 570.759.9552
- 1.2 Contact Person: Keith Mazzie

2.0 LABORATORY IDENTIFICATION

- 2.1 HTL Test Notification: HTL09035
- 2.2 HTL Lab Certifications: Miami-Dade County (05-1014.01); Florida Building Code;
(TST1527); IAS (TL-244); AAMA; WDMA; Keystone Certificate;
Texas Department of Insurance

3.0 SCOPE OF WORK

- 3.1 Introduction
Acurlite Structural Skylights, Inc. retained HTL, LLC to conduct on their Secure Series Large Missile Structural Skylights to the requirements of the Florida building code (HVHZ) specifically test standards TAS 201, TAS 202, and TAS 203.
- 3.2 Report Information
Table 3.1 provides the test dates for each mock-up and specimen number.

Table 3.1: Specimen Test Dates

Specimen #	Test Date
1A	7/15/09 – 7/20/09
5	6/29/09
6	7/02/09
7	7/01/09 – 7/02/09

4.0 PRODUCT IDENTIFICATION

- 4.1 Product Type: Structural Skylight
- 4.2 Model Designation: Large Missile
- 4.3 Performance Class: +/- 80 psf

Engineer of Record

Vinu J. Abraham, P.E.
FL Reg. #53820
12/14/2009

Report Writer

Mark Creslein
Kristin Adhers
12/14/2009



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Test Report #: 0541-0418-09
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Specimen #: 1A, 5, 6, & 7
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4.4 Overall Size:

Specimen	Overall Size
1A	188-9/16" (w) x 48" (h)
5	169-1/4" (w) x 108-27/32" (h)
6	
7	

4.5 Configuration:

4.6 Drawing:

Fixed

This test report is incomplete if not accompanied by Acurlite Structural Skylights, Inc. drawing labeled "Large Missile Testing" (sheets 1 through 12) bearing the ink stamp of Hurricane Test Laboratory, LLC.
Acurlite Structural Skylights, Inc.

4.7 Sample Source:

5.0 PRODUCT DESCRIPTION

5.1 Frame Construction

The framing members were fabricated using the aluminum extrusions defined in Table 5.1.

Table 5.1: Aluminum Extrusion Details

Description	Part #	Overall Cross-Section	Alloy
Rafter	H08858	2.500" x 8.000" x 0.125"	6061-T6
Large Purlin	H08857	2.500" x 4.000" x 0.100"	6061-T6
Small Purlin	S31713	2.500" x 1.000" x 0.090"	6061-T6
Tube	H01071	2.500" x 2.500" x 0.125"	6061-T6
Gusset Plate	GP-1	8.000" x 7.968" x 0.250"	6061-T6

Typical Frame Corner Construction: In both configurations the rafter member was notched and ran through while the purlin was also notched and received by the adjacent rafter. Once in place the purlin was fastened into place using two (2) #14 x 1-1/2" HWH Tek Screws per each end for a total of four (4) per purlin.

Angle Spacers and Flashings at Jamb locations: At jamb locations a 0.040" formed aluminum closure flashing was mechanically fastened to a 0.040" aluminum angle spacer using 1/8" x 1/4" aluminum pop rivets spaced 12" on center. The aluminum angle spacer was then mechanically fastened to the adjacent purlin using #12 x 1" HWH Tek Screws spaced at 12" on center.

NOTE: The flashings varied in shape and size depending on the condition to which they were installed. However, they all maintained the same thickness/alloy and installation method as described above.

Angle Spacers and Flashings at Ridge/Knee locations: The installation of the angle spacers and flashings at the ridge/knee location was identical to that of the Jamb location. However, instead of its use being to fill the space between the jamb and substrate, it was used to fill the space at the peak of the ridge between the two purlins on both sides of the ridge.

Tube at Gable Post: The extruded aluminum tube was fastened to the small purlin at this location using #12 x 1" HWH Tek Screws at 12" on center.

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Glass Type B consisted of an laminated glass lite with an overall thickness of 9/16" (nominal) with the following components.

- 1/4" tempered glass
- 0.060" Solutia Saflex® PVB Interlayer (Miami-Dade NOA #03-0827.08)
- 1/4" tempered glass

Glass Type C consisted of an laminated glass lite with an overall thickness of 9/16" (nominal) with the following components.

- 1/4" tempered glass
- 0.090" DuPont SentryGlas® Plus ionoplast interlayer (Miami-Dade NOA #07-1116.04)
- 1/4" tempered glass

5.4.2 Glazing Method

The glass lites used in the test specimens were glazed using the following procedure:

Glazing @ Hip Locations:

Exterior: 5/16" x 1/2" double-sided foam tape followed by a continuous bead of Dow corning 795 silicone sealant.

Interior: Using Continuous strips of Elbex 9/32" x 7/16" EPDM rubber glazing gasket.

Glazing @ All Other Locations:

Exterior: Using Continuous strips of Elbex 9/32" x 7/16" EPDM rubber glazing gasket followed by a continuous bead of Dow Corning 795 silicone sealant.

Interior: Using Continuous strips of Elbex 9/32" x 7/16" EPDM rubber glazing gasket.

5.4.3 Daylight Opening and Glass Bite

Table 5.4 provides the daylight opening and glass bite for each lite used in the mock-up.

Table 5.4: Daylight Opening and Glass Bite Details

Specimen #	Glazing Material Type	Location	Daylight Opening	Glass Bite
1A	A	Top Left Lite	97-1/16" (w) x 52-1/4" (h)	Min. 27/32"
	B	Middle Left Lite	94-1/4" (w) x 52-1/4" (h)	
	B	Lower Left Lites	45-7/8" (w) x 52-1/4" (h)	
	C	Top Right Lite	97-1/16" (w) x 52-1/4" (h)	
	C	Middle Right Lite	94-1/4" (w) x 52-1/4" (h)	
	C	Lower Right Lites	45-7/8" (w) x 52-1/4" (h)	
	A	Left Gable Lite	84-1/32" (w) x 36" (h)	
	C	Right Gable Lite	84-1/32" (w) x 36" (h)	
5/6/7	C	Left Lite	97-1/16" (w) x 52-1/4" (h)	Min. 27/32"
	C	Middle Lite	94-1/4" (w) x 52-1/4" (h)	
	C	Top Right Lite	45-7/8" (w) x 52-1/4" (h)	
	C	Bottom Right Lite	45-7/8" (w) x 52-1/4" (h)	

5.5 Weather Stripping

None Used.

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Specimen #	Location	Fastening Components	Fastening Description
5, 6, 7	Intermediate Rafters at Head and Sill locations	Two (2) 3/8" x 3" x 3" x 8" long structural aluminum angles per intermediate rafter and the head and sill locations. Two (2) 1/2-13 x 4-1/2" HH cap screws with finish nut, lock washer and flat washer. Four (4) 1/2" x 4" HH Lag Screws w/ Flat Washer	Each side of the intermediate rafters had a 3/8" x 3" x 3" x 8" long structural aluminum angle. Two (2) 1/2-13 x 4-1/2" HH cap screws with lock and flat washers, were put through one side of the rafter through both angles, it was drilled into a finish nut on the other side. Four (4) 1/2" x 4" HH Lag Screws w/ Flat Washer were used on each side of the rafter to fasten the angles to the wood substrate.
	Jamb Rafters at Head and Sill Locations	One (1) 3/8" x 3" x 3" x 8" long structural aluminum angle per jamb rafter and the head and sill locations. Two (2) 1/2-13 x 4-1/2" HH cap screws with finish nut, lock washer and flat washer. Four (4) 1/2" x 4" HH Lag Screws w/ Flat Washer	One side of the jamb rafter had a 3/8" x 3" x 3" x 8" long structural aluminum angle. Two (2) 1/2-13 x 4-1/2" HH cap screws with lock and flat washers, were put through one side of the rafter through the angle, it was drilled into a finish nut on the other side. Four (4) 1/2" x 4" HH Lag Screws w/ Flat Washer were used on the side of the rafter to fasten the angles to the wood substrate.

Table 6.0: Product Installation Details

7.0 TEST SEQUENCE

Table 7.1 provides a summary of the test sequence for each test specimen tested.

Table 7.1: Test Sequence

Test Specimen 1A	Test Specimen 5, 6, 7
1. Air Infiltration Test	1. Large Missile Impact
2. Positive Pre-Load	2. Positive Cyclic Load
3. Positive Design Load	3. Negative Cyclic Load
4. Negative Pre-Load	
5. Negative Design Load	
6. Water Infiltration Test	
7. Positive Overload	
8. Negative Overload	

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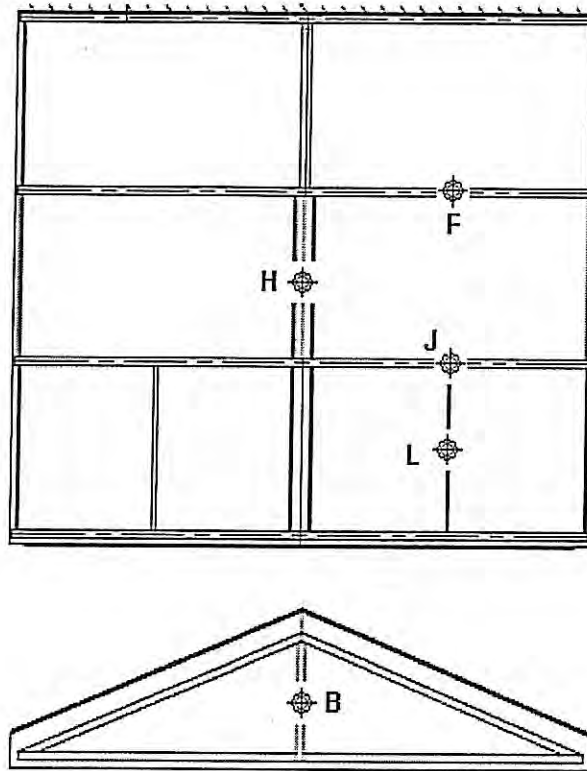


Figure 8.1: Deflection Gage Locations
Uniform Static Load Test

8.3.2 Positive Load Test Results

Table 8.3.2 provides the positive uniform static load test results for the deflection gage locations shown in Section 8.3.1.

Table 8.3.2: Positive Uniform Static Load Test Results

Specimen #	Gage Location	Load (psf)	Deflection (in.)		Permanent Set (in.)	
			Measured	Allowed	Measured	Allowed
1A	B	+ 80.00	0.014	0.207	0.007	0.075
		+ 160.00	0.028	N/A	0.007	0.075
	F	+ 80.00	0.107	0.561	0.039	0.202
		+ 160.00	0.205	N/A	0.032	0.202
	H	+ 80.00	0.365	0.913	0.220	0.329
		+ 160.00	0.443	N/A	0.195	0.329
	J	+ 80.00	0.309	0.561	0.075	0.202
		+ 160.00	0.207	N/A	0.030	0.202
	L	+ 80.00	0.062	0.044	0.002	0.110
		+ 160.00	0.137	N/A	0.028	0.110

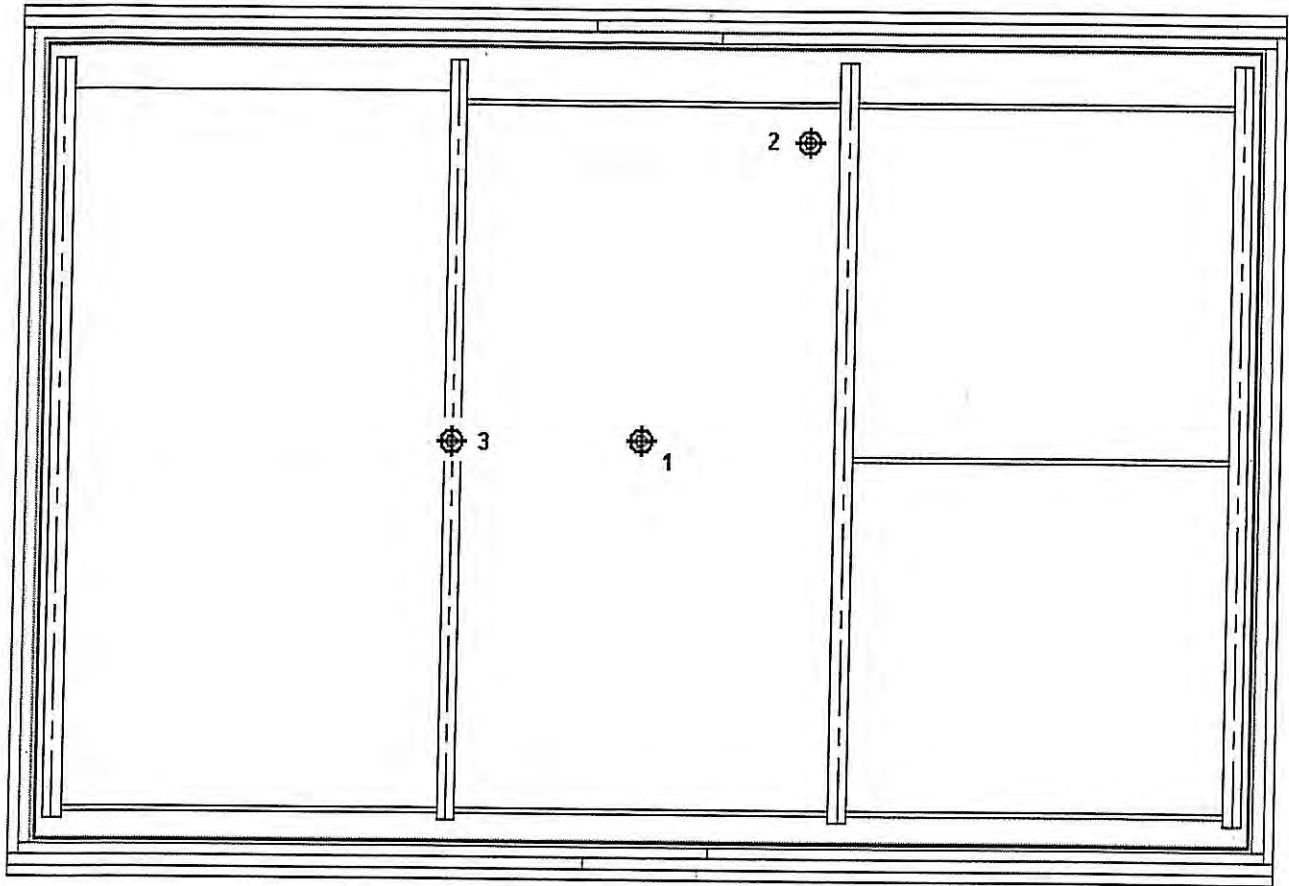
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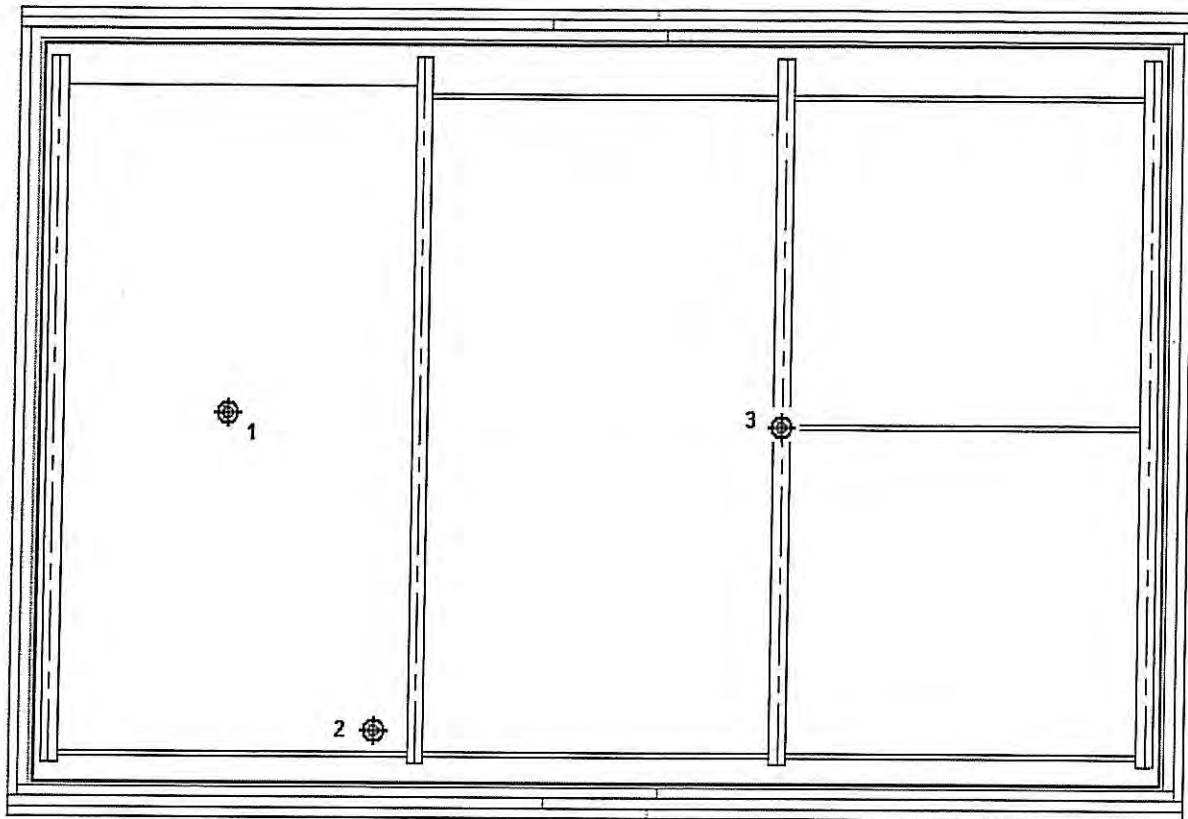
Specimen 5

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Specimen 7

Figure 8.2: Large Missile Impact Locations

8.4.2 Test Results - Large Missile Impact Test

Table 8.4.2 provides the large missile impact test results.

Table 8.4.2: Large Missile Impact Test Results

Specimen #	Impact #	Missile Weight	Missile Length (in.)	Missile Velocity (ft/sec)	Glass Temp. (°F)	X Coord. ¹ (in.)	Y Coord. ² (in.)
5	1	9 lbs.	92"	49.81	76	85.00	52.50
	2			48.59		103.00	91.00
	3			49.49		57.00	50.50
6	1	9 lbs 4 oz.	92"	48.99	86	82.00	53.00
	2			48.56		101.50	11.00
	3			48.89		139.00	50.00
7	1	8 lbs. 14 oz.	92"	49.18	85	28.00	52.00
	2			49.40		47.00	14.50
	3			49.85		112.00	52.50

¹Measured from the bottom of test specimen.

²Measured from the left side of test specimen.

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8.5.2 Test Spectrum - Cyclic Load Test

Tables 8.5.2.1 and 8.5.2.2 provide the positive and negative test spectrum respectively.

Table 8.5.2.1: Positive Load Test Spectrum

Stage	1	2	3	4
Pressure Range (psf)	16.0 – 40.0	0 – 48.0	40.0 – 64.0	24.0 – 80.0
Number of Cycles	3500	300	600	100

Table 8.5.2.2: Negative Load Test Spectrum

Stage	5	6	7	8
Pressure Range (psf)	24.0 – 80.0	40.0 – 64.0	0 – 48.0	16.0 – 40.0
Number of Cycles	50	1050	50	3350

8.5.3 Deflection Results - Cyclic Load Test

Table 8.5.3 shows the cyclic test results for each test specimen.

Table 8.5.3: Cyclic Load Test Results

Specimen #	Location	Inward (Positive Load)		Outward (Negative Load)	
		Measured Permanent Set (in.)	Allowable Permanent Set (in.)	Measured Permanent Set (in.)	Allowed Permanent Set (in.)
5	B	0.031	0.212	0.125	0.212
	E	0.063		0.063	
	G	0.063	0.110	0.063	0.110
6	B	0.063	0.212	0.063	0.212
	E	0.000		0.000	
	G	0.063	0.110	0.000	0.110
7	B	0.008	0.212	0.125	0.212
	E	0.000		0.067	
	G	0.000	0.110	0.000	0.110

8.5.4 Conclusion - Cyclic Load Test

Upon completion of the cyclic load test, HTL carefully inspected the test specimens for failures. HTL observed no signs of failure; as such, these specimens the cyclic load test requirements of Florida Building Code TAS 203 and ASTM E1886/1996.

9.0 SUMMARY

Table 9.0 provides a summary of the test results for Accurlite Structural Skylights, Inc.'s Specimens 1A, 5, 6, & 7.

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Test Report #: 0541-0418-09
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Specimen #: 1A, 5, 6, & 7
Page: 16 of 16

12.0 WITNESSES (ALL OR PARTIAL)

Vinu J. Abraham, P.E.	CEO	HTL, LLC
Kristin Norville, E.I.	Assistant Operations Manager	HTL, LLC
Alan Rule	Technician	HTL, LLC
Howard Bennet	Technician	HTL, LLC
John Spallina	Technician	HTL, LLC
Martin Gibbard	Technician	HTL, LLC

Engineer of Record

12/14/2009

Report Writer

12/14/2009

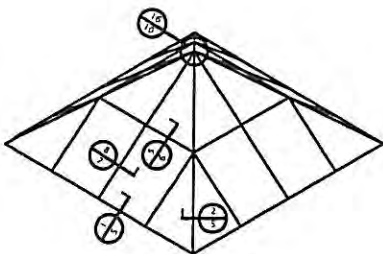


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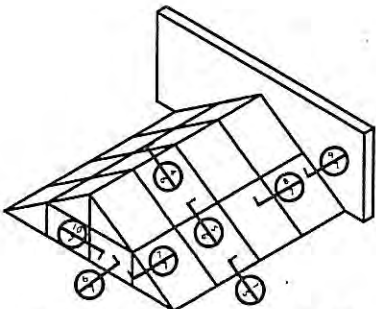
Test Report #: 0541-0418-09
Report Expiration: 12/14/2014
Specimen #: 1A, 5, 6, & 7

APPENDIX A:
Acurlite Structural Skylights, Inc.
Drawings Labeled:
Large Missile Testing
12 SHEETS

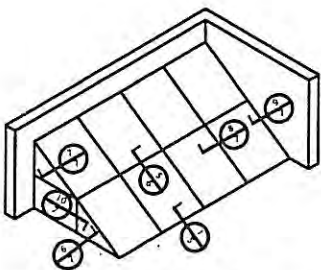
LARGE MISSILE TESTING



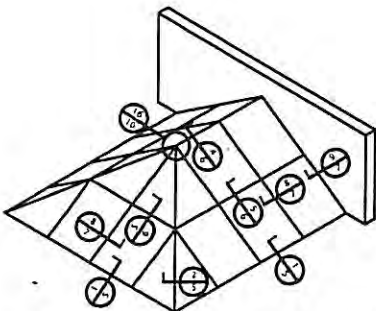
PYRAMID



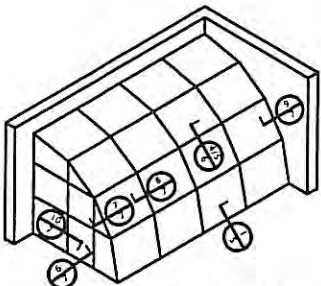
DOUBLE PITCH WITH GABLE



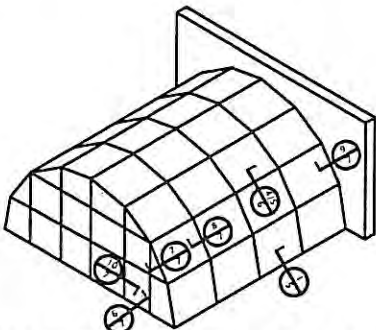
SINGLE PITCH WITH GABLE



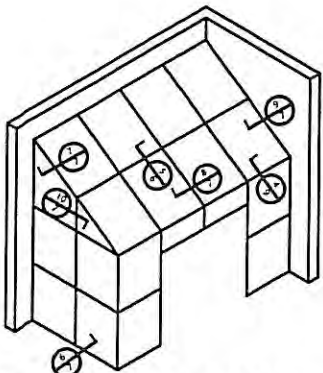
DOUBLE PITCH WITH HIP



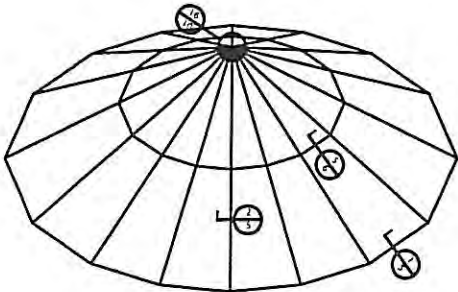
SEGMENTED BARRELL QUATER VAULT
WITH GABLE



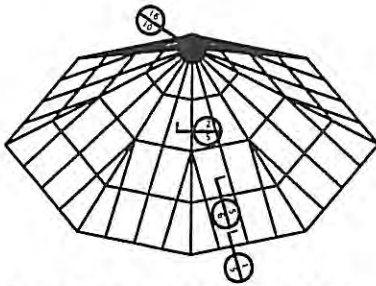
SEGMENTED BARRELL HALF VAULT
WITH GABLE



STRAIGHT EAVE LEAN-TO
WITH GABLE



POLYGON



POLYGON WITH JACK RAFTERS



Tested Unless
Otherwise Noted
DATE _____
JOB # _____

0591-0918-09
12-14-2009

DADE COUNTY USE		ENGINEER STAMP

acurite
engineering light
Acrylic Structural Supplies Inc.
107 North West Street, PO Box 9
Beverly, MA 01915
© 1997-2009 acurite.com sales@acurite.com

9/4/09

LARGE MISSILE TESTING

COVERSHEET

DATE: 7/24/09

SCALE: NONE

EXPIRATION DATE: NONE

SHEET: 1 of 12

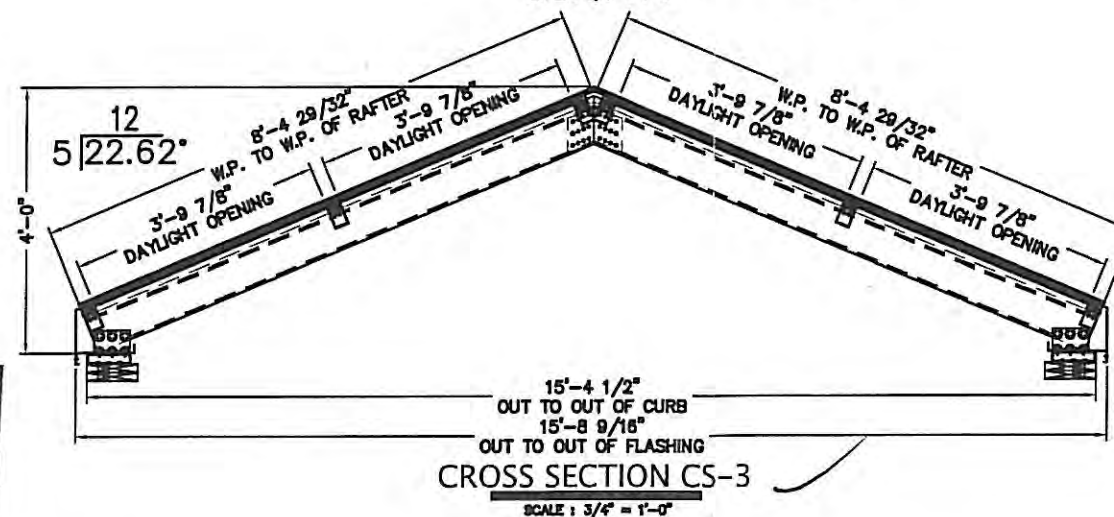
(1) UNIT REQUIRED AS SHOWN
SPECIMEN # 1A

Tested Unless
Otherwise Noted

DATE _____
JOB # _____
0541-0418-
12-14-200

3/8 X 3 X 3 X 4 LONG
INTERMEDIATE PURLIN SUPPORT ANGLE
ATTACH TO CURB USING 1/2-13 HEX HD TAP BOLT
DRILL AND TAP INTO STEEL
ATTACH TO PURLIN USING (4) #12 X 1 H.W.H. TEK SCREWS
QUANTITY, SIZE AND REQUIREMENT OF SUCH BASED ON
SIZE AND GEOMETRY OF SKYLIGHT
(NOT PART OF PRODUCT APPROVAL)

NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.



DADE COUNTY USE		ENGINEER STAMP

PROJECT NAUS LARGE MISSILE TESTING RESEARCHERS USE

PLANS AND ELEVATIONS

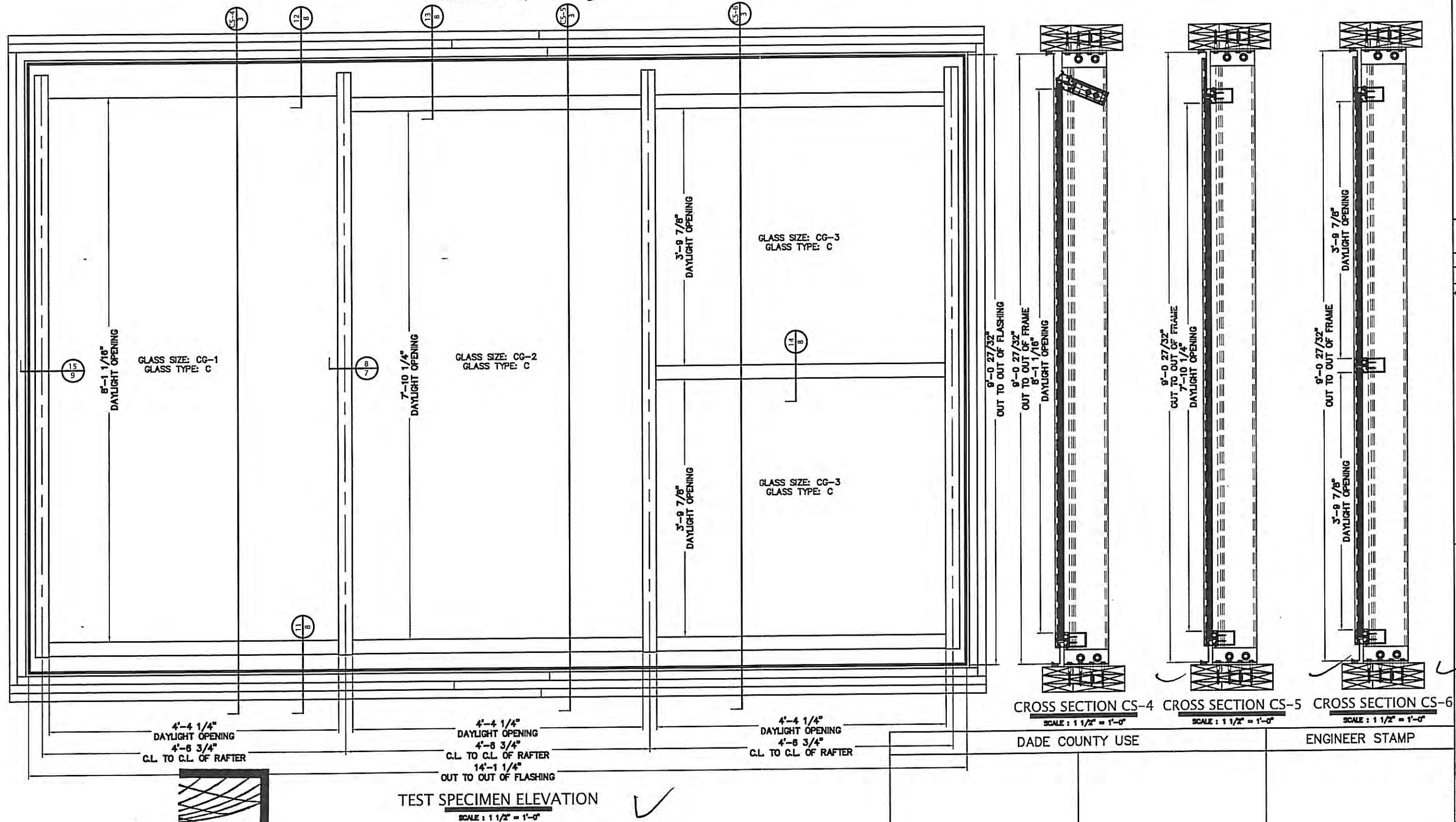
acurlite
engineering light
Acurlite Structural Engineering Inc.
1847 North Union Street, PO Box 2
Harrisburg, PA 17105
① 717/747-6553 • FAX 717/652-
sales@acurlite.com

80/4/8

2 of 12

TAS 201 AND 203-94 LARGE MISSILE IMPACT AND CYCLIC TEST SPECIMEN @ 80 PSF

SPECIMEN # 5,6 & 7 ✓



HTL

Tested Unless
Otherwise Noted

DATE _____
JOB # _____

0541-0418-09
12-14-2009

NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.

© 9/4/08

acurlite
engineering lights

Acurlite Commercial Displays Inc.
1817 North Vero Street, PO Box 8
Burrville, PA 15009

● BURRVILLE, PA 15009 ●
sales@acurlite.com

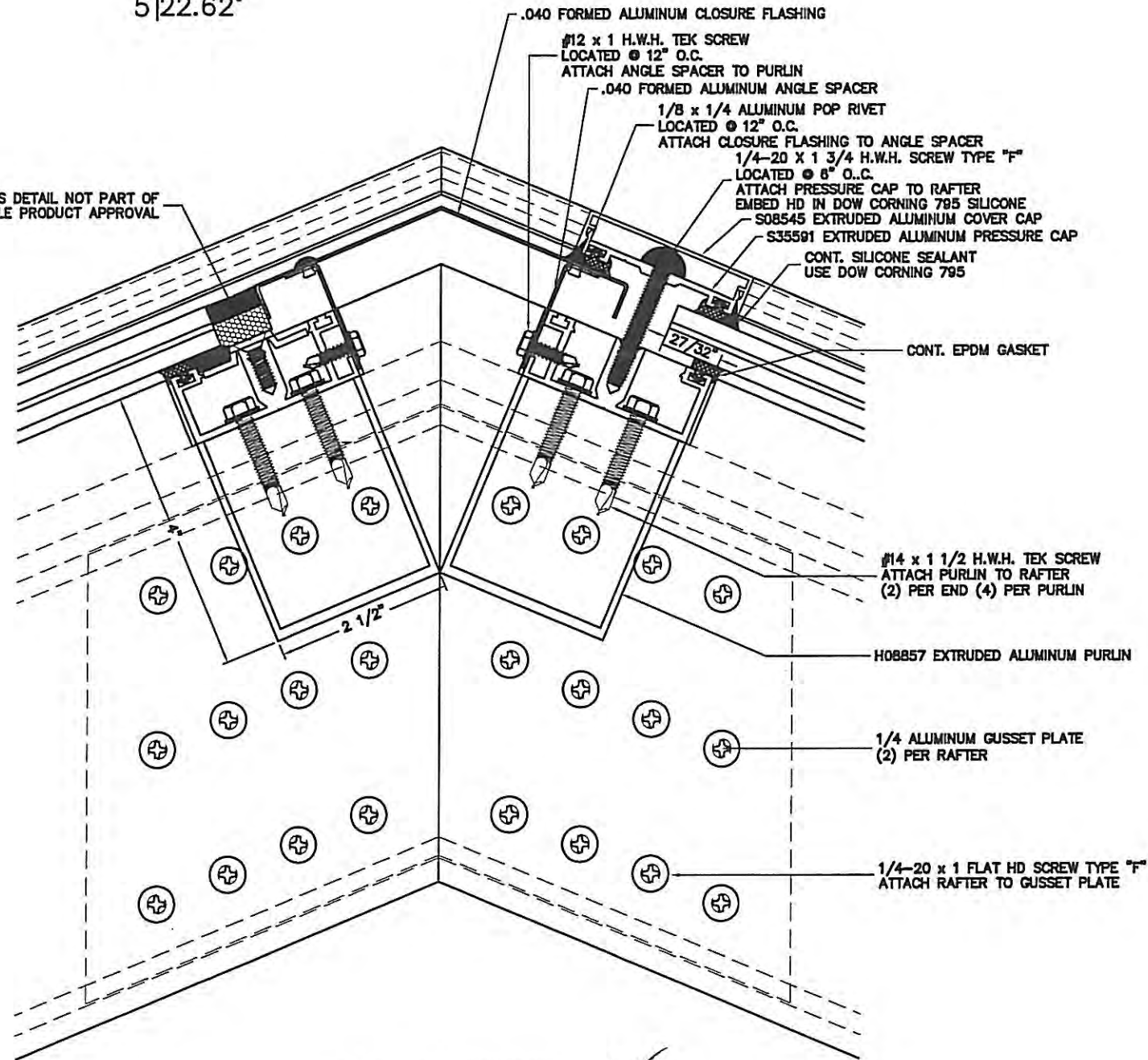
PROJECT NAME
LARGE MISSILE TESTING

PLANS AND ELEVATIONS

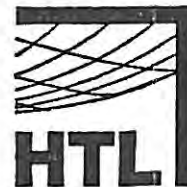
3 of 12

12
5 22.62°

THIS DETAIL NOT PART OF
LARGE MISSILE PRODUCT APPROVAL

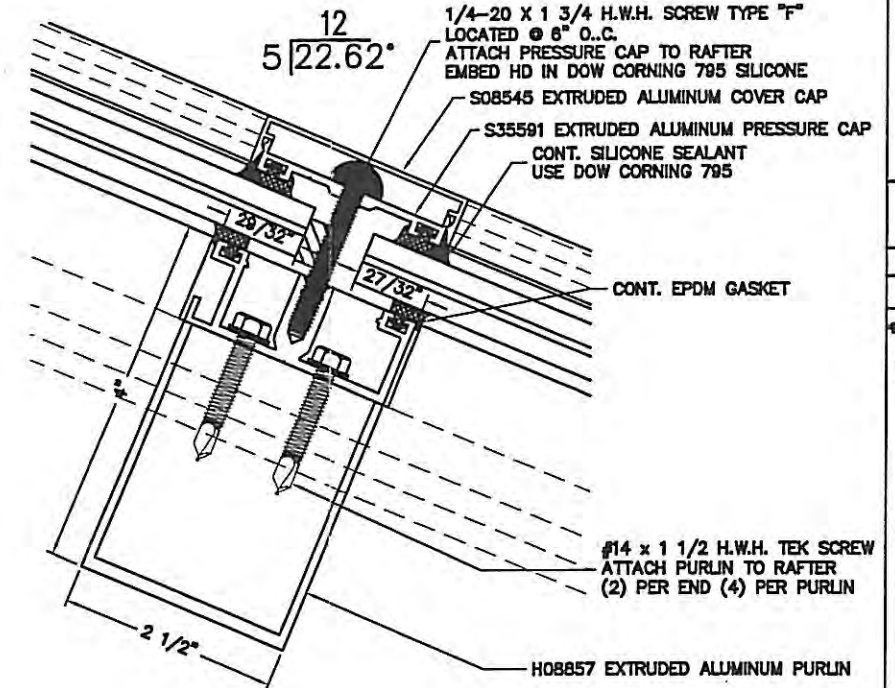


4
6 RIDGE/KNEE
DETAIL



Noted Unless
Otherwise Noted
DATE
JOB #
6541-6418-09
12-14-2009

NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.



5
6 HORIZONTAL
DETAIL

DADE COUNTY USE		ENGINEER STAMP

LARGE MISSILE TESTING

DETAILS

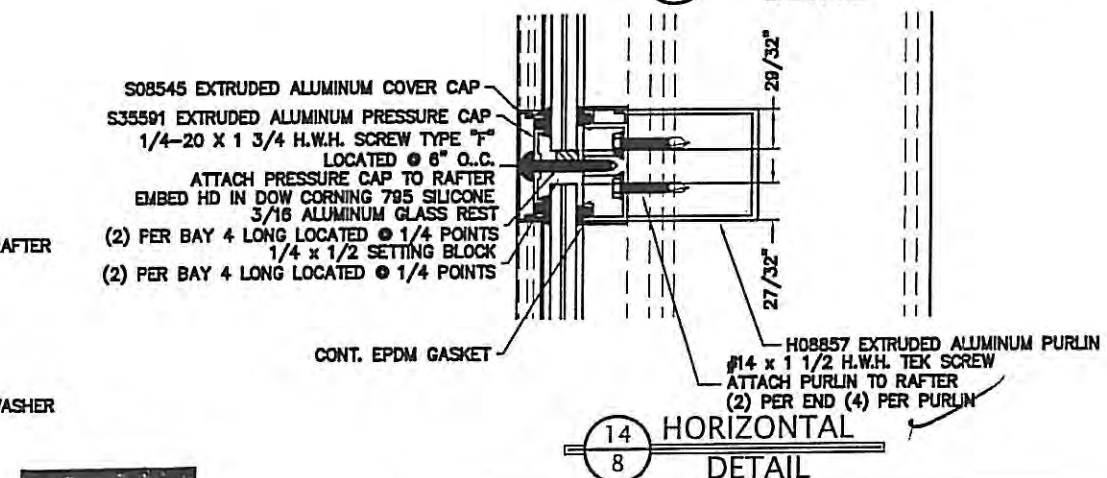
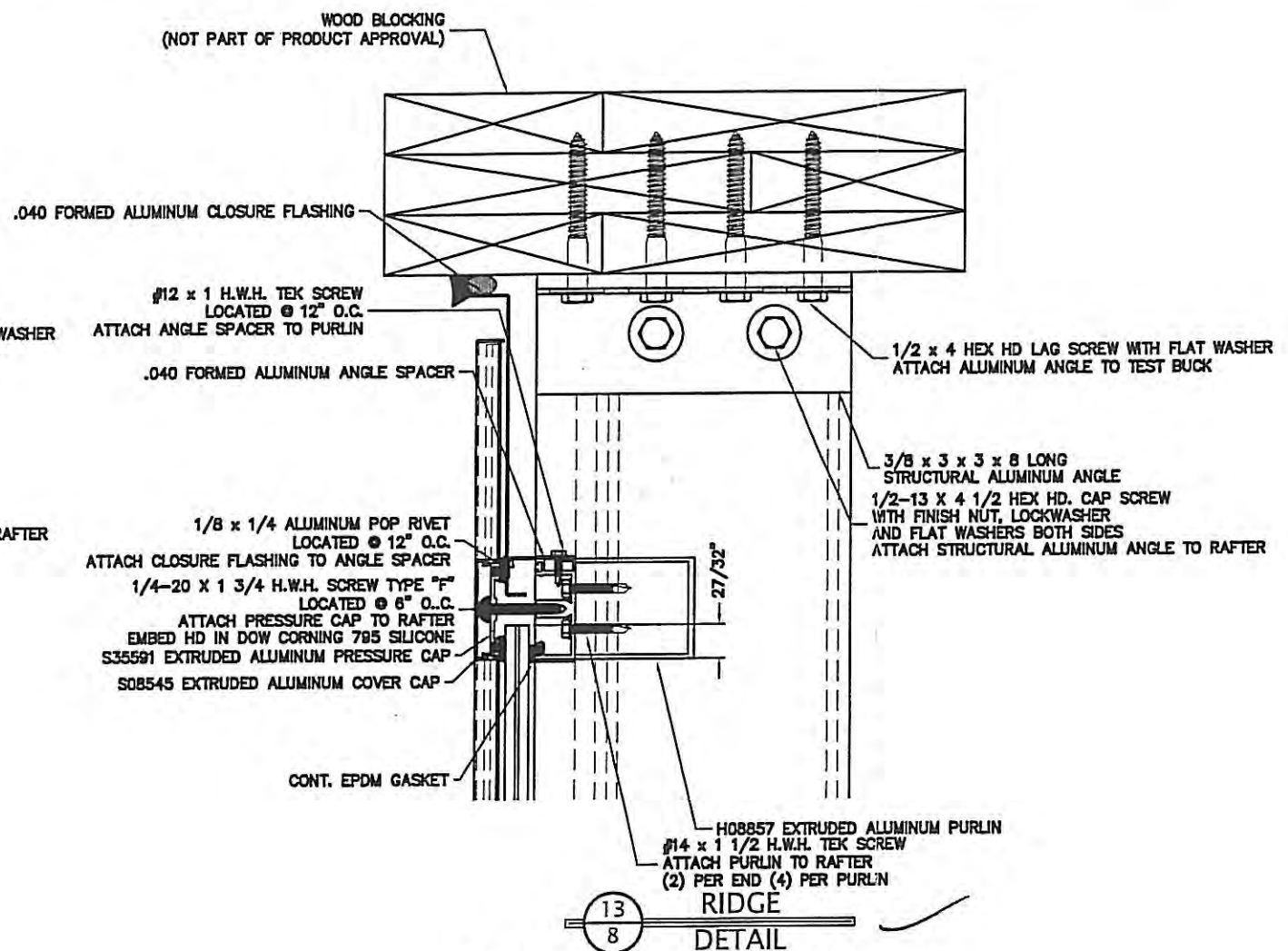
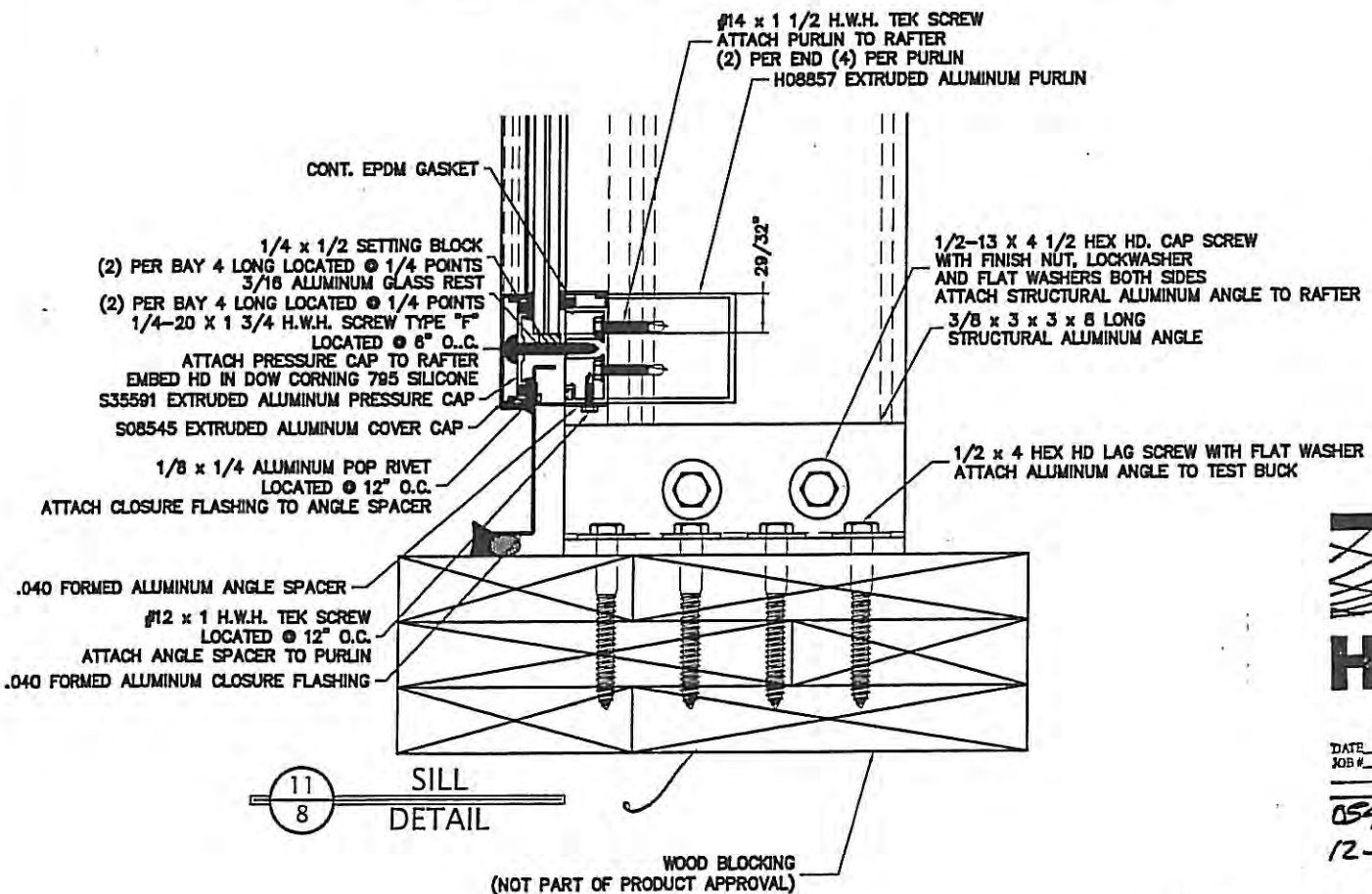
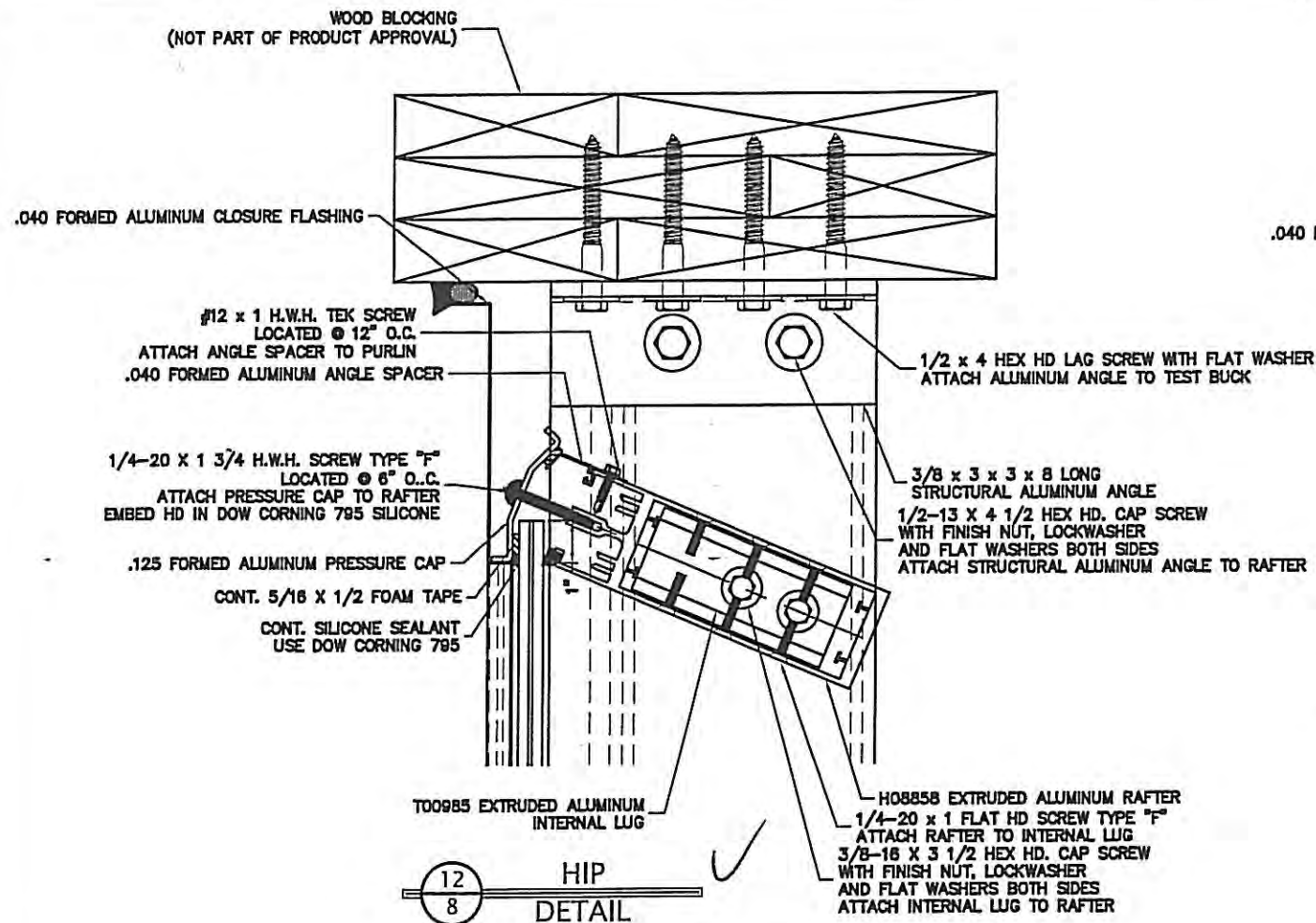
DATE
7/24/09
FULL
SHEET

6 of 12

acurite
engineering light
Acute Thermal Systems Inc.
187 North Main Street, PO Box 3
Barrett, VA 22015
© 2009 acurite engineering light
sales@acurite.com

9/4/09





DADE COUNTY USE		ENGINEER STAMP
Tolerances Unless Otherwise Noted DATE _____ JOB # _____ 0591-0918-09 12-14-2009		DETAILS 8 of 12

NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.

REV	DATE	DESCRIPTION

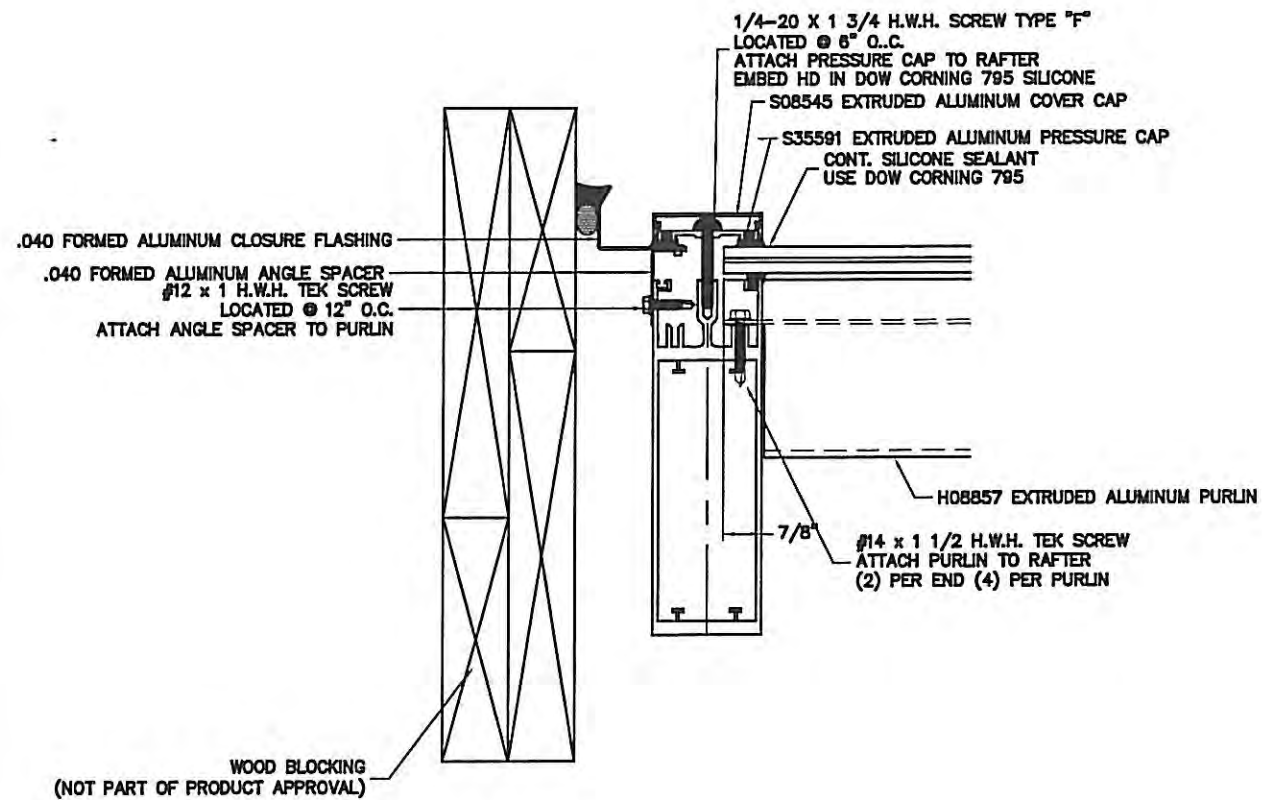
acurite
engineering light
Acrylic Extruded Light Fixtures Inc.
1827 North Vero Beach, P.O. Box 8
Vero Beach, FL 32909
© POLYMER © POLYMER sales@acurite.com

9/4/09

LARGE MISSILE TESTING

DETAILS

8 of 12



15
9 JAMB
DETAIL



Tested Unless
Otherwise Noted
DATE: _____
JOB #: _____

0591-0918-09
12-14-2009

NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.

DADE COUNTY USE		ENGINEER STAMP

PROJECT NAME
LARGE MISSILE TESTING

DATE
7/24/09

SCALE
1/4" = 1'-0"

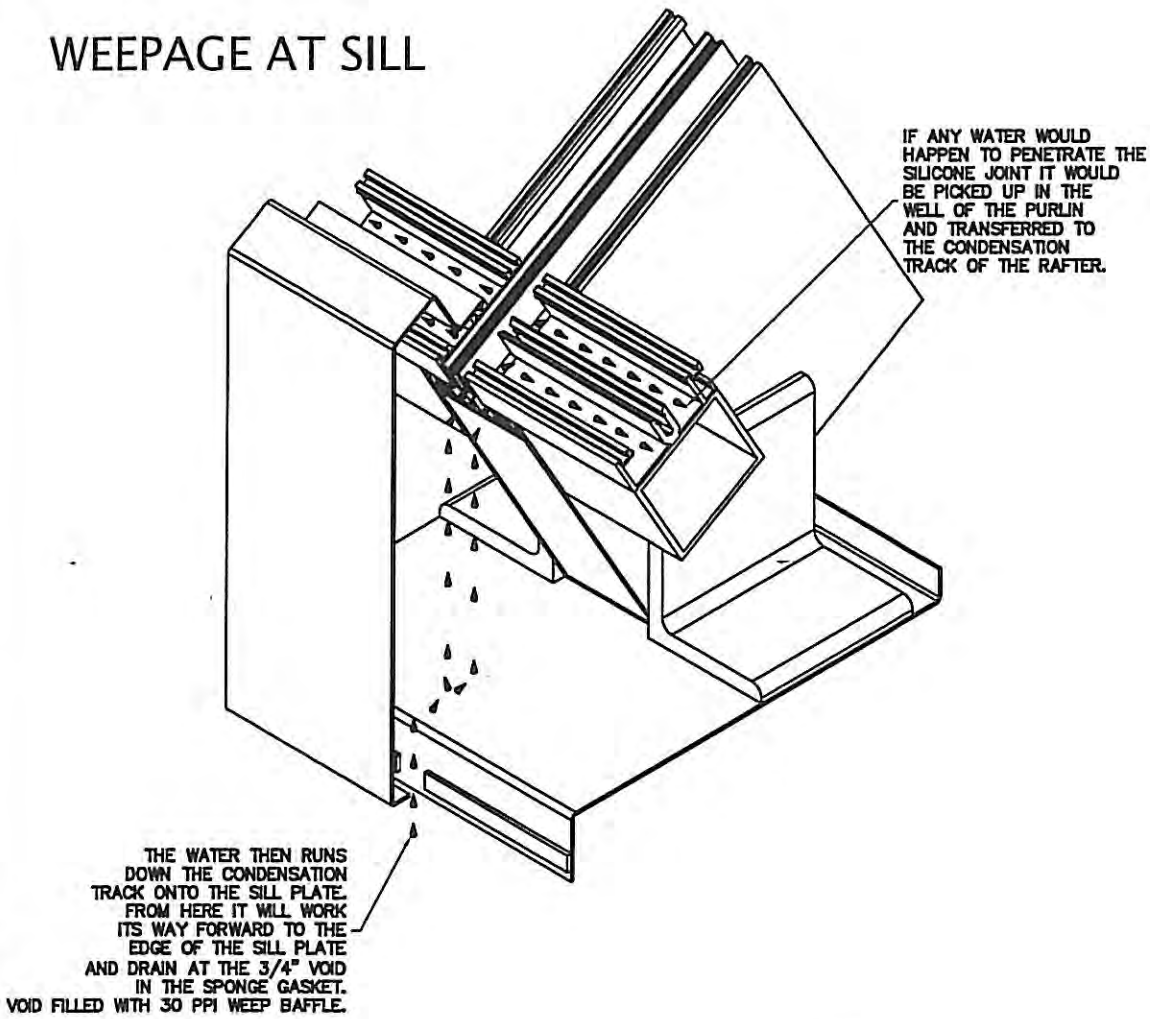
SHEET
9 of 12

DETAILS

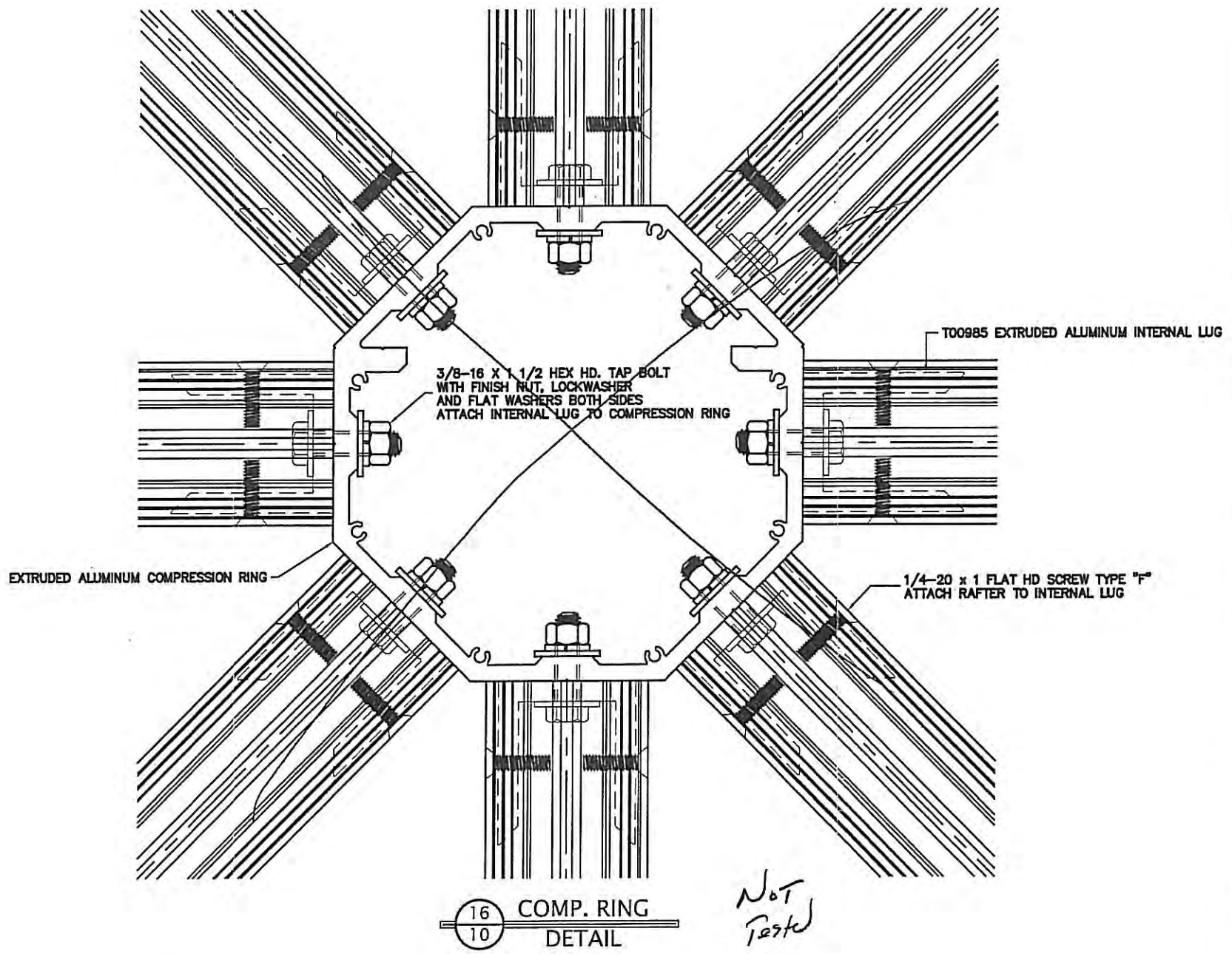
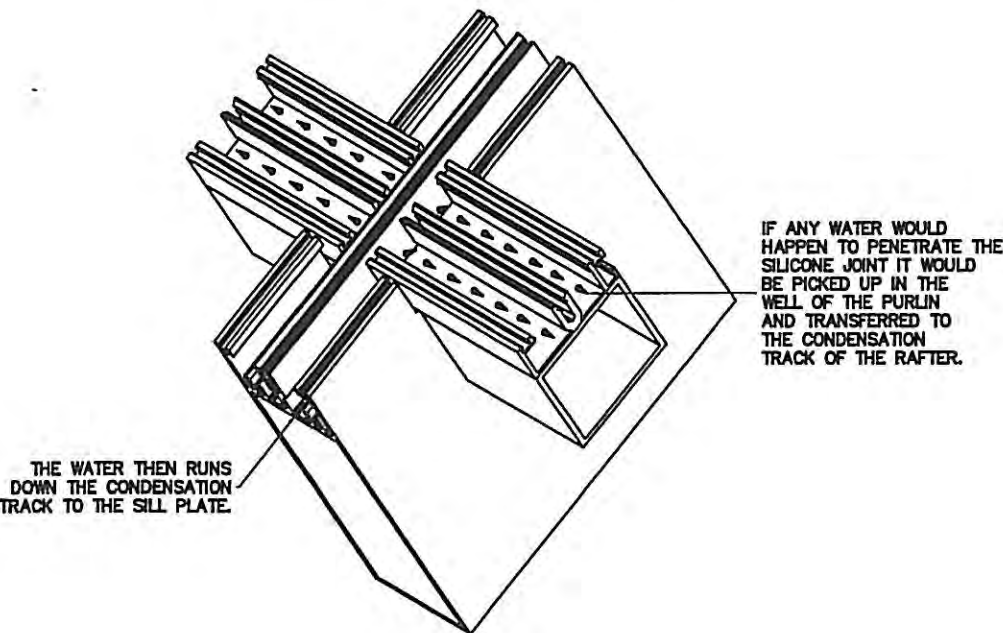
DATE
9/4/09

acurlite
engineering light
Acurlite Engineering Light Inc.
1807 North Vero Beach, PO Box 9
Vero Beach, FL 32909
© acurlite.com sales@acurlite.com

WEEPAGE AT SILL



WEEPAGE AT INTERMEDIATE



Tested Unless
Otherwise Noted

DATE
JOB #

0541-6418-09
12-14-2009

NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.

DADE COUNTY USE		ENGINEER STAMP

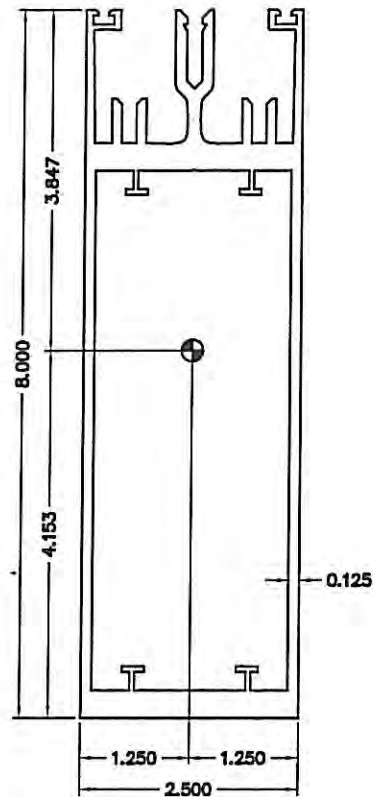
acurite
engineering light
Acute Thermal Imaging Inc.
187 North West Street, PO Box 1
Tampa, FL 33603
© 1997-2009 acurite.com sales@acurite.com

9/4/08

LARGE MISSILE TESTING

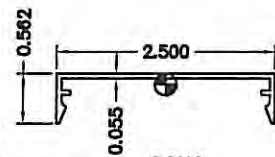
BILL OF MATERIALS

10 of 12



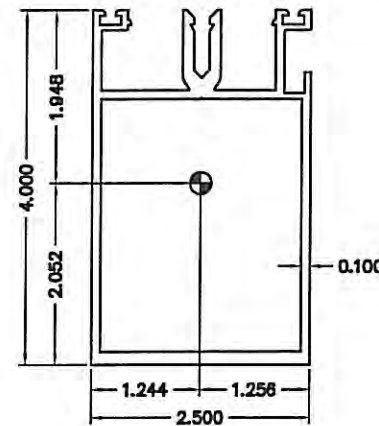
Area: 4.0777
 Perimeter: 54.9115
 Bounding box: X: -1.2500 -- 1.2500
 Y: -4.1528 -- 3.8472
 Moments of Inertia: X: 31.3863
 Y: 3.5664
 Product of Inertia: XY: 0.0000
 Radii of gyration: X: 2.7743
 Y: 0.9352
 Principal moments and X-Y directions about centroid:
 I: 3.5664 along [0.0000 1.0000]
 J: 31.3863 along [-1.0000 0.0000]
 Weight per lineal foot: 4.77 lbs.
 Aluminum Alloy: 6061-T6

H08858 RAFTER
 FULL SCALE



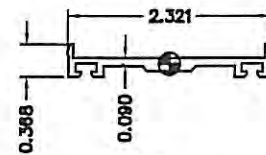
Area: 0.2110
 Perimeter: 7.5289
 Bounding box: X: -1.2500 -- 1.2500
 Y: -0.4392 -- 0.1228
 Moments of Inertia: X: 0.0049
 Y: 0.1783
 Product of Inertia: XY: 0.0000
 Radii of gyration: X: 0.1527
 Y: 0.9191
 Principal moments and X-Y directions about centroid:
 I: 0.0049 along [1.0000 0.0000]
 J: 0.1783 along [0.0000 1.0000]
 Weight per lineal foot: 0.25 lbs.
 Aluminum Alloy: 6061-T6

S08545 COVER CAP
 FULL SCALE



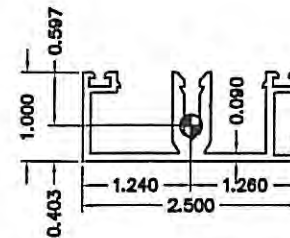
Area: 1.6983
 Perimeter: 31.2602
 Bounding box: X: -1.2438 -- 1.2562
 Y: -2.0520 -- 1.9480
 Moments of Inertia: X: 3.4288
 Y: 1.4491
 Product of Inertia: XY: -0.0182
 Radii of gyration: X: 1.4204
 Y: 0.9237
 Principal moments and X-Y directions about centroid:
 I: 1.4489 along [0.0082 -1.0000]
 J: 3.4267 along [1.0000 0.0082]
 Weight per lineal foot: 1.99 lbs.
 Aluminum Alloy: 6061-T6

H08857 PURLIN
 FULL SCALE



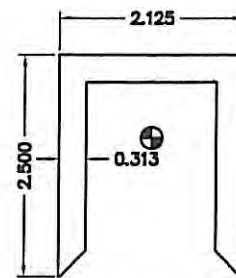
Area: 0.2955
 Perimeter: 8.9888
 Bounding box: X: -1.1634 -- 1.1826
 Y: -0.1489 -- 0.2190
 Moments of Inertia: X: 0.0012
 Y: 0.1486
 Product of Inertia: XY: 0.0000
 Radii of gyration: X: 0.0634
 Y: 0.7092
 Principal moments and X-Y directions about centroid:
 I: 0.0012 along [1.0000 0.0000]
 J: 0.1486 along [0.0000 1.0000]
 Weight per lineal foot: 0.354 lbs.
 Aluminum Alloy: 6061-T6

S35591 PRESSURE CAP
 FULL SCALE



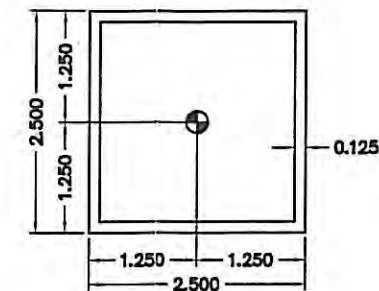
Area: 0.7307
 Perimeter: 15.0209
 Bounding box: X: -1.2403 -- 1.2597
 Y: -0.4032 -- 0.5968
 Moments of Inertia: X: 0.0800
 Y: 0.4177
 Product of Inertia: XY: -0.0027
 Radii of gyration: X: 0.3309
 Y: 0.7581
 Principal moments and X-Y directions about centroid:
 I: 0.0800 along [1.0000 -0.0080]
 J: 0.4178 along [0.0080 1.0000]
 Weight per lineal foot: 0.88 lbs.
 Aluminum Alloy: 6061-T6

S31713 PURLIN
 FULL SCALE



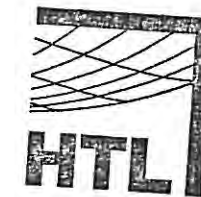
Area: 1.9458
 Perimeter: 13.3088
 Bounding box: X: -1.0624 -- 1.0626
 Y: -1.5635 -- 0.9365
 Moments of Inertia: X: 1.0731
 Y: 1.3224
 Product of Inertia: XY: -0.0001
 Radii of gyration: X: 0.7427
 Y: 0.8244
 Principal moments and X-Y directions about centroid:
 I: 1.0731 along [1.0000 -0.0004]
 J: 1.3224 along [0.0004 1.0000]
 Weight per lineal foot: 2.335 lbs.
 Aluminum Alloy: 6061-T6

T00985 INTERNAL LUG
 FULL SCALE



Area: 1.1875
 Perimeter: 19.0000
 Bounding box: X: -1.2500 -- 1.2500
 Y: -1.2500 -- 1.2500
 Moments of Inertia: X: 1.1195
 Y: 1.1195
 Product of Inertia: XY: 0.0000
 Radii of gyration: X: 0.9709
 Y: 0.9709
 Principal moments and X-Y directions about centroid:
 I: 1.1195 along [0.7071 -0.7071]
 J: 1.1195 along [0.7071 0.7071]
 Weight per lineal foot: 1.39 lbs.
 Aluminum Alloy: 6061-T6

H01071 TUBE
 FULL SCALE



DATE: 9/4/08
 JOB #: 0541-0918-09
 12-14-2009

DADE COUNTY USE		ENGINEER STAMP

acurite
 engineering light
 100 West 1st Street, PO Box 100
 Fort Lauderdale, FL 33301
 954-581-1111
 sales@acurite.com

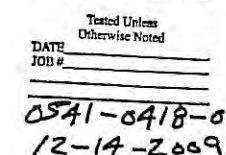
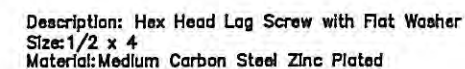
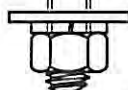
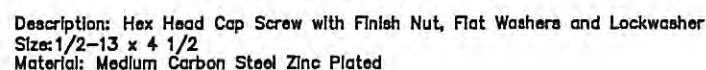
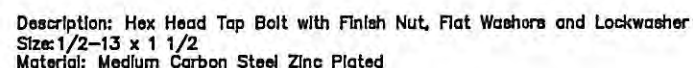
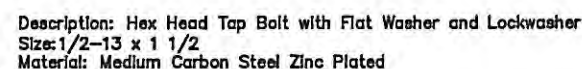
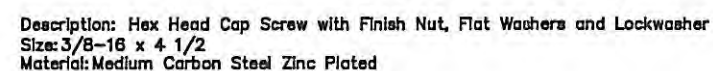
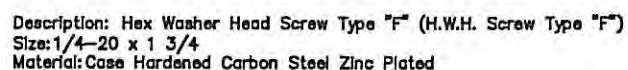
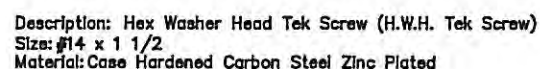
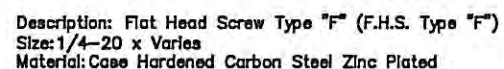
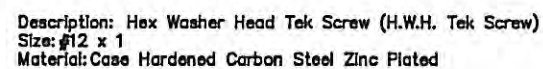
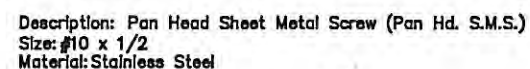
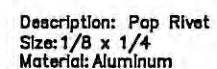
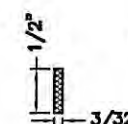
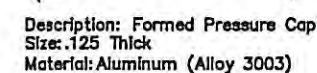
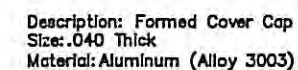
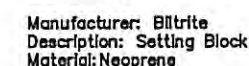
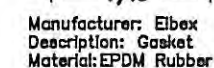
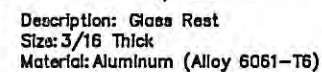
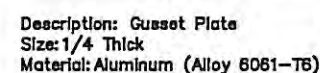
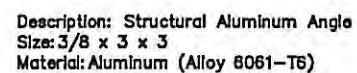
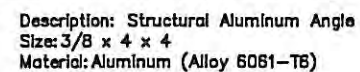
9/4/08

LARGE MISSILE TESTING

BILL OF MATERIALS

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NOTES:
 1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.



NOTES:
1. SEE SHEET 4 OF 12 FOR GLASS SIZES AND TYPES.

DADE COUNTY USE		ENGINEER STAMP

PROJECT NAME	LARGE MISSILE TESTING
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THE BILL OF MATERIALS

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60/1/6



american international engineering inc.
1207 North Vinn Street, PO Box 12
Baraboo, WI 53009

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Revision Log

Rev. #	Date	Page(s)	Section #	Revision(s)
0	12/14/2009	N/A	N/A	Original report issued.