



Architectural Testing

**TEST REPORT**

**Report No.:** C5760.04-301-44

**Rendered to:**

SOLATUBE INTERNATIONAL, INC.  
Vista, California

**PRODUCT TYPE:** Tubular Daylight Device – Open Ceiling

**SERIES/MODEL:** M74 DS

**SPECIFICATION:** Occupational Safety and Health Administration/U.S. Department of  
Labor Regulations Standards- 29 CFR 1926 Subpart M (Fall Protection)  
1926.501(b)(4)(i); 1926.501(i)(2); 1926.501 (b)(4)(ii); 1926.501 (b)(4)(ii)

<b>Test Date:</b>	<b>02/13/13</b>
<b>Report Date:</b>	<b>05/13/13</b>
<b>Revision 1 Date:</b>	<b>06/19/13</b>
<b>Test Record Retention Date:</b>	<b>05/13/17</b>

**1.0 Report Issued To:** Solatube International, Inc.  
2210 Oak Ridge Way  
Vista, California 92081

**2.0 Test Laboratory:** Architectural Testing, Inc.  
4 Rancho Circle  
Lake Forest, California 92630  
949.460.9600

**3.0 Project Summary:**

**3.1 Product Type:** Tubular Daylight Device – Open Ceiling

**3.2 Series/Model:** M74 DS

**3.3 Compliance Statement:** Results obtained are tested values and were secured by using the designated test method(s).

**3.4 Test Dates:** 02/13/2013

**3.5 Test Location:** Architectural Testing Inc.'s test facility in Lake Forest, California.

**3.6 Test Sample Source:** The specimens were witnessed during production and tagged prior to shipment on 01/29/13, (Reference Architectural Testing Test Specimen Selection Report No. C5760.01-301-SR1, dated 02/25/2013). Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of four years from the test completion date.

**3.7 Drawing Reference:** The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

**3.8 List of Official Observers:**

<u>Name</u>	<u>Company</u>
John Mayfield	Architectural Testing, Inc.

**4.0 Test Specification(s):**

**SPECIFICATION:** Occupational Safety and Health Administration/U.S. Department of Labor Regulations Standards- 29 CFR 1926 Subpart M (Fall Protection) 1926.501(b)(4)(i); 1926.501(i)(2); 1926.501 (b)(4)(ii); 1926.501 (b)(4)(ii)

A 700 lbf weight, fabricated from a bag filled with sand, was placed on the center of the dome for a minimum of 60 seconds. The bag was removed and the test unit was inspected for any signs of damage or failure. The bag was then dropped from a 2' height above the dome, any visible damage was noted.

The static test was performed to demonstrate that a M74 DS Skylight System, installed according to manufacturer's instructions; and in new or undamaged condition can support a 350-Pound weight at any one time based on 1926.502(i)(2)

The impact test was performed to demonstrate the adequacy of the 700Lb Static Test results

**5.0 Test Specimen Description:**

**5.1 Product Sizes:**

Overall Area: 0.8 m <sup>2</sup> (9.0 ft <sup>2</sup> )	Width		Length	
	millimeters	inches	millimeters	inches
Outside Curb Dimension	876	34-1/2	876	34-1/2
Outside Frame Dimension	914	36	914	36

	Dimension	
	millimeters	inches
Dome Thickness	3	0.118
Dome Height	171	6.73
Dome Diameter	795	31-5/16

	Mass	
	Kilograms	Pounds
Dome Weight	2.0	4.4

## 5.0 Test Specimen Description: (Continued)

### 5.2 Frame Construction:

Frame Member	Material	Description
Curb Cap Assembly	Zinc/Aluminum alloy-coated steel	P/N: 210215
Outer Dome	Polycarbonate/Makrolon	P/N: 508005
24" Extension Tube	Aluminum w/reflective film	P/N: 320320
Tube Ring	Aluminum w/reflective film	P/N: 410420
Diffuser Collar	Aluminum w/reflective film	P/N: 420725
Diffuser Panel	Acrylic	P/N: 420985

	Joinery Type	Detail
All corners	Riveted	Corner brackets (P/N: 210205) are secured to the metal curb cap using (4) 1/8" x 1/4" aluminum rivets with steel mandrel
Rigid Foam Insulation	Adhered	Formed from (4) pieces of nominal 1" thick insulation board, each with a radius cut to fit the contours of the opening; adhered directly to the inside of the curb cap using sealant; seams concealed with foil tape

**Curb Cap Assembly:** The curb cap assembly was formed from nominal 0.0276" thick hot-dip zinc/aluminum alloy-coated commercial grade steel. The curb cap included (6) 1-1/2" long by 1/2" wide tabs located at 60° on center around the perimeter of the opening, which were folded into the opening and secured to the tube ring using (1) 1/8" x 1/4" rivet at each tab. Nominal 0.0276" thick hot-dip zinc/aluminum alloy-coated commercial grade steel corner brackets were riveted to each corner using (4) 1/8" x 1/4" rivets. The outer dome was set directly over the opening.

A nominal 0.022" thick by 7/8" wide dome protection band was set around the circumference of the outer dome. The outer dome and dome protection band were compressed and secured using a nominal 0.063" thick 2-piece dome clamp assembly. Rivet nuts were installed at 45° on center around the circumference of the opening for attachment of the dome clamp assemblies. The (8) dome clamp assemblies were secured into rivet nuts spaced evenly around the circumference of the dome using (1) 10-32 x 5/8" hex head machine screw.

Nominal 1" thick rigid insulation board was fit and sealed to the bottom of the curb cap assembly, reflective tape was used to seal voids/seams. The tube ring was sealed with sealant full perimeter to the rigid insulation.

### 5.0 Test Specimen Description: (Continued)

**Tube Rings and Tube Extension:** The tube ring was employed to connect the top of the reflective tubing extension to the curb cap assembly and the contiguous diffuser assembly. The tube ring was formed from a 5-3/8" wide by 90-3/8" long by 0.018" thick aluminum sheet with a reflective coating and (6) evenly spaced tabs along one side. The tube ring was rolled and the ends were fastened together using (3) 1/8" x 1/4" rivets.

The 24" extension tube was fabricated from a 24" wide by 89-3/8" long by 0.018" thick aluminum sheet with a reflective coating, which was rolled and secured through each end using (1) 1/8" x 1/4" rivet located 2-1/4" on center from the ends and 4" on center thereafter. The 24" extension tube has (6) evenly spaced tabs on each end that interlock with the corresponding tabs on the tube ring and collar. The interlocking tabs on the extension tube and tube rings are compressed and secured in place by a metal belt. The metal belt is comprised of a 2" x 96" x 0.022" thick band that employs a stainless steel torsion spring actuated toggle clamping mechanism. The spring is compressed after the belt is placed around the interlocking tabs of the tube connections to secure the joint between the extension tube and tube ring.

**Diffuser/Collar Construction:** The open ceiling diffuser assembly was comprised of a 2-5/8" wide x 90-3/16" long x 0.018" thick aluminum collar with a reflective coating and a single glazed acrylic diffuser. The collar employed six equally spaced tabs on the end that interlocked into the corresponding tabs on the extension tube. A metal belt and torsion spring were compressed around the interlocking collar and extension tube to secure the diffuser assembly. The bottom side of the collar had twelve evenly spaced tabs that fit into corresponding holes around the circumference of the light diffuser to join the collar to the light diffusing panel. The EPDM dress ring was snap-fitted over the tabs of the collar and around the perimeter of the acrylic diffuser lite.

### 5.3 Weatherstripping:

Description	Quantity	Location
3/8" wide by 3/16" thick PVC closed cell foam gasket	1 row	Adhered full perimeter to the rigid insulation so that it is compressed against the curb
3/4" wide by 1/4" thick PVC closed cell foam gasket	1 row	Adhered to the metal around the top circumference of the curb cap turret at the TDD aperture and compressed against the outer dome

**5.0 Test Specimen Description: (Continued)**

**5.4 Glazing:** *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glazing Type	Glazing	Glazing Method
Outer Dome	0.118" thick Monolithic Polycarbonate	Secured with the dome clamp assembly and pressing the inner thermal disk onto the foam seal at the formed metal curb cap opening
Diffuser Panel	0.100" thick Monolithic Prismatic Acrylic	Secured by the collar tabs through the 3/4" pre-punched holes located at 15° on center around the circumference of the diffuser panel and compressed at the perimeter by the PVC foam dress ring seal

Location	Quantity	Daylight Opening Diameter		Bite
		millimeters	inches	
Outer Dome	1	724	28-1/2	1-3/4"
Diffuser Panel	1	718	28-1/4	1/2"

**5.5 Drainage:** No drainage was utilized.

**5.6 Hardware:**

Description	Quantity	Location
2-piece Dome Clamp Assembly	8	Located around the circumference of the dome at 45° on center secured through the corresponding rivet nuts using (1) 10-32 x 5/8" hex head screw
Dome Edge Protection Band	1	Placed around the circumference of the dome, secured by the dome clamp assembly
Metal Belt and Torsion Spring	2	Secured over the interlocking tabs of the extension tube/tube ring assembly and over the interlocking tabs of the collar/diffuser assembly

**5.7 Reinforcement:** No reinforcement was utilized.

**6.0 Installation:**

The specimen was installed onto a nominal 2x4 Spruce-Pine-Fir curb that was secured on a nominal 1/2" OSB deck. The rough opening allowed for a 1/4" shim space. The PVC foam gasket adhered to the underside of the curb cap assembly was compressed against the curb.

<b>Location</b>	<b>Anchor Description</b>	<b>Anchor Location</b>
(1) anchor through each of the precut holes in the vertical apron of the curb cap assembly	(1) #8 x 2" Phillips truss head self-pierce sheet metal screw	(4) anchors were located on each side at 2-1/2" and 10" on center from each corner

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

**7.1 OSHA Safety Test**

<b>Test</b>	<b>Load Location</b>	<b>Results</b>
700 lbf static load	Center of dome	No visible damage

*Note: The 700 lbf weight was gently applied perpendicular to the center of the dome. After 60 seconds of rest time, there was no visible damage to the skylight.*

**7.2 OSHA Fall Safety Drop Test**

<b>Test Method</b>	<b>Load Location</b>	<b>Results</b>
700 lbf-ft. (2' drop height)	Center of dome	No visible damage

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

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: John S. Mayfield

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John S. Mayfield  
Laboratory Manager



Digitally Signed by: Tyler Westerling

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Tyler Westerling, P.E.  
Senior Project Engineer

JM: tw/ms

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

Appendix-A: Photographs (2)

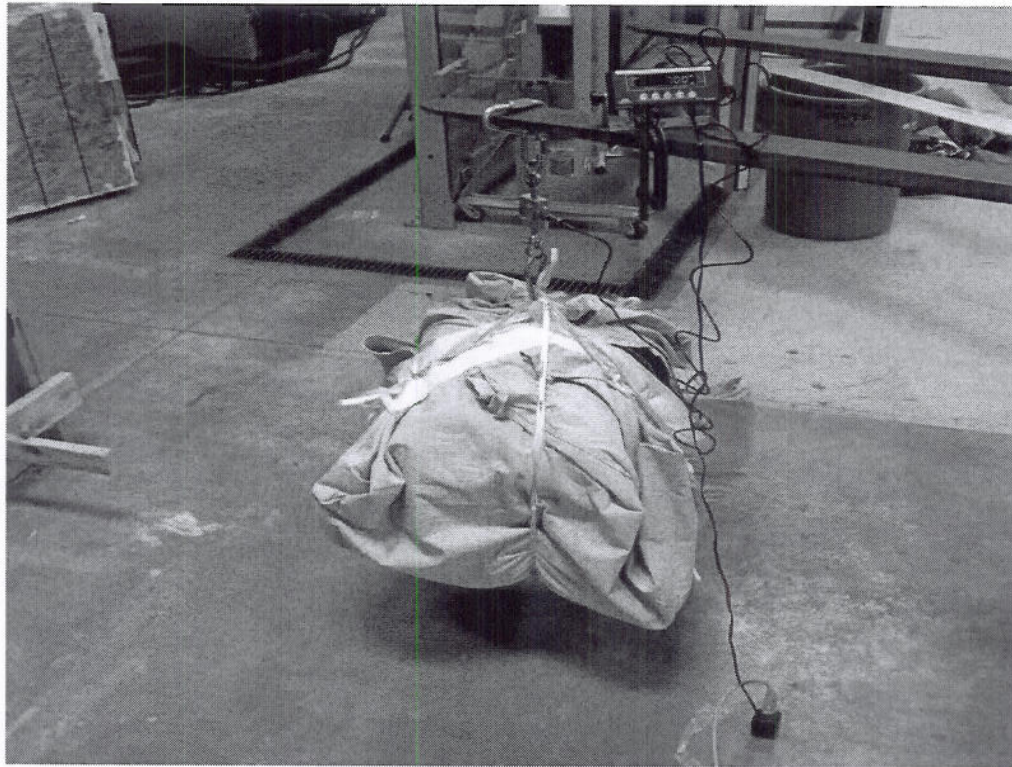
Appendix-B: Drawings (64)



### Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
1	6/19/13	1-2	Changed Series/Model from 640 DS to M74 DS
1	6/19/13	Appendix B	Included new drawings which reference the M74 DS Series/Model

**Appendix A**  
**Photographs**



**Photo No. 1: Weight of bag prior to drop test (700 lbf)**



**Photo No. 2: Test Specimen prior to application of the 700 lbf static load**



**Photo No. 3: After impact of the 700 lbf static load from 2 foot drop height**

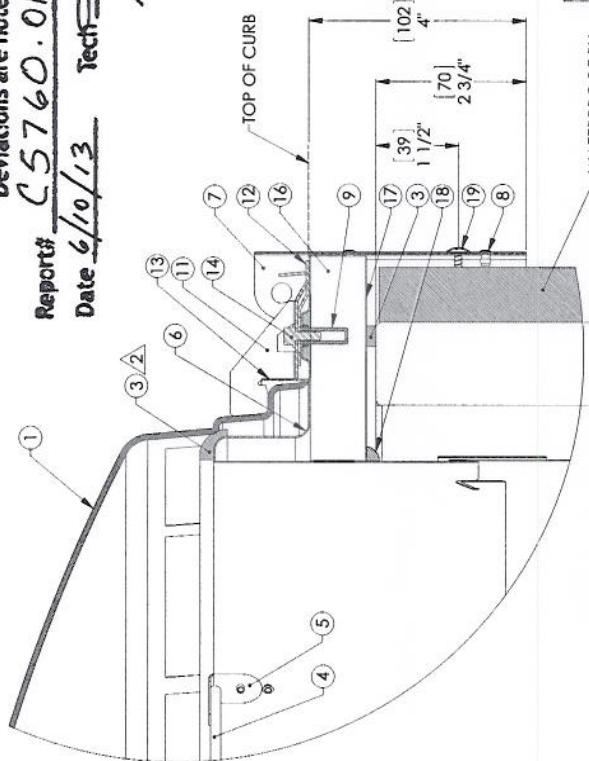
## **Appendix B**

### **Drawings**

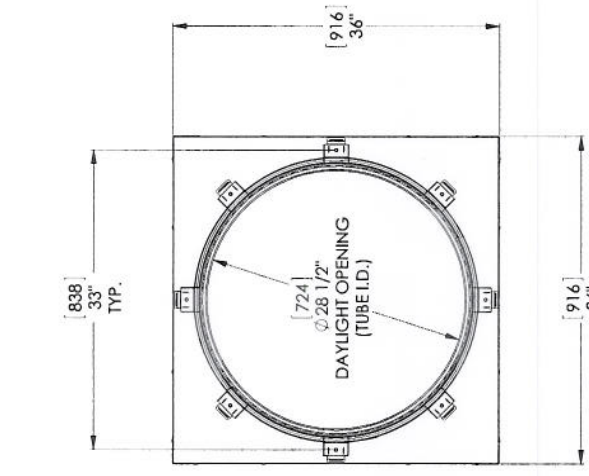
Test sample complies with these details.  
Deviations are noted.

Report# C5760.01-301-44

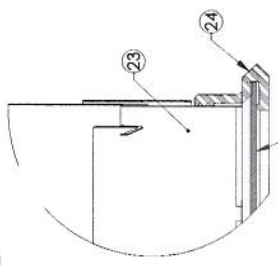
Date 6/10/13 Tech [Signature]



**SECTION A-A**



**DETAIL B  
SCALE 4:1**



**DETAIL C  
SCALE 4:1**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	508005	OUTER DOME M74 DS	1
2	508104	INNER THERMAL DISC-AGEDS	1
3	600325	CLOSED CELL FOAM-3/16 X 3/8	1
4	400050	STAINLESS STEEL ROD	6
5	400485	SECURITY FAB	6
6	210215	CURB CAP M74 DS	1
7	2H0205	CORNER BRACKET M74 DS	4
8	700635	RIVET 1/8"	29
9	700196	RIVET NUT 10-30 CLOSED END	8
10	600285	PHI-SEAL	1
11	710105	FOAM CLAMP M74 DS	8
12	400695	DOME CLAMP/FOG PANEL M74 DS	8
13	400655	DOME EDGE PROTECTION BAND M74 DS	1
14	700785	SCREW 10-32 X 5/8" HEX FLANGED	8
15	410420	TUBE RING M74 DS	1
16	500375	INSULATION SECTION- RIGID	4
17	601090	FOG TAPE	4
18	700800	SEALANT	1
19	700480	SCREW 10 X 7 5/8"	16
20	500025	TORSION SPRING M74 DS	2
21	504000	METAL BELT M74 DS	2
22	500307/500495	24" / 48" EXTENSION TUBE M74 DS	1
23	420725	DIFFUSER COLLAR M74 DS	1
24	410045	DR-SS RING SEAL M74 DS	1
25	420985	DIFFUSER M74 DS PRISMATIC PANEL	1
26	504010	BELT HASP	2

**SOLATUBE**  
SOLATUBE INTERNATIONAL, INC.  
14250 W. 10TH AVENUE, SUITE 100  
DENVER, CO 80202  
WWW.SOLATUBE.COM

UNLESS OTHERWISE SPECIFIED:  
DIMENSION TOLERANCE  
FRACTIONS 1/4" & OVER  
INCHES ± 0.015  
DECIMALS ± 0.0015  
MATERIAL  
FINISH

DATE: 26 JAN 13  
DRAWN BY: STEVEN S  
CHECKED BY: [Blank]  
APPROVED BY: [Blank]

TITLE: **M74 DS CURB MOUNT  
OPEN CEILING**

SCALE: 2:1

REV: 2  
M74 DS-O-DP-FC-L2-REG

SHEET 01 OF 1

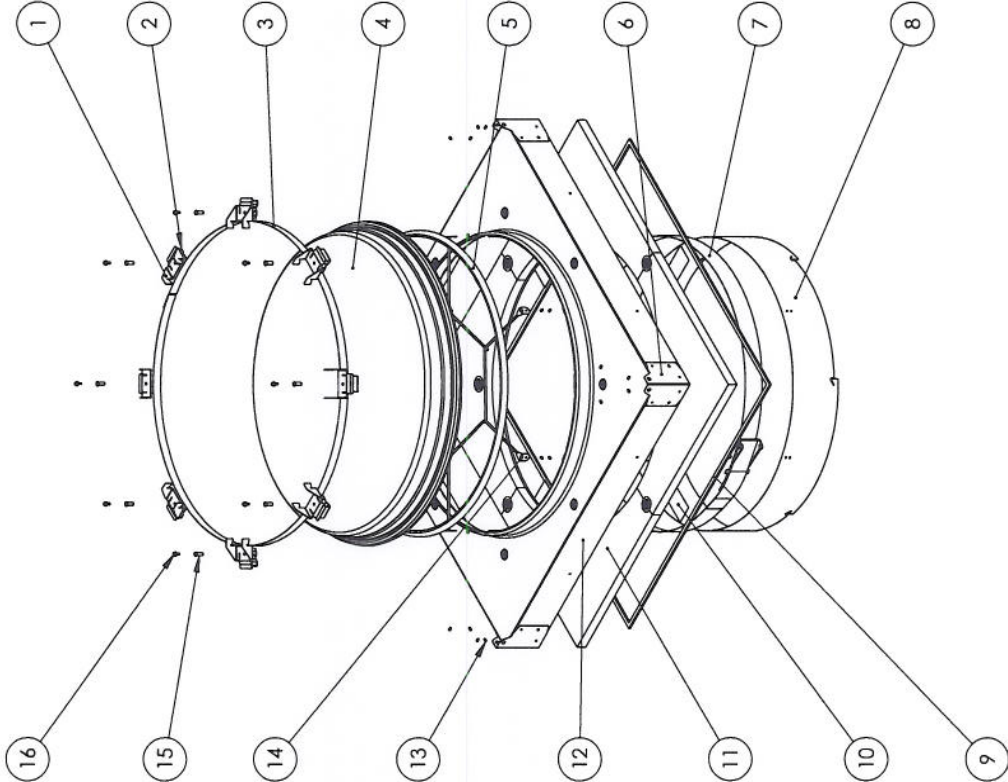
NOTE:  
1. CONSECUTIVE METAL BELTS, #21 & EXTENSION TUBES, #22 MAY BE ADDED ACCORDING TO PROJECT LIGHTING REQUIREMENTS  
2. FOAM THICKNESS RANGES FROM 1/8" TO 3/16"

REVISIONS			
REV.	ECO	DATE	APPROVED
		1/24/2013	STEVENS



Test sample complies with these details.  
Deviations are noted.

Report# C5760.01-301-44  
Date 6/10/13 Tech [Signature]



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	400695	DOME C-CLAMP FOOT M74 DS	8
2	710105	DOME C-CLAMP	8
3	400685	DOME EDGE PROTECTION BND M74 DS	1
4	508005	OUTER DOME M74 DS	1
5	600295	CLOSED CELL FOAM 3/16" x 3/8"	1
6	210205	CORNER BRACKET M74 DS	4
7	400395	TUBE BELT M74 DS EXT. TUBE FASTENER	1
8	410420	INNER CURB COLLAR	1
9	600325	CLOSED CELL FOAM 3/16" x 3/8"	1
10	601090	FOIL TAPE SECTION	0.011
11	500375	INSULATION SECTION M74 DS CURB	4
12	210215	CURB CAP M74 DS	1
13	700635	RIVET 1/8 X 1/4 AL/ST MULTI	29
14	480015	SECURITY WIRE GUARD M74 DS	1
15	700196	RIVET NUT 10-32 CLOSED END	8
16	700785	HEX HEAD FLANGE BOLT	8
17	700300	SEALANT COLLAR BEAD (NOT SHOWN)	0.4
18	700300	SEALANT RIVET BEAD (NOT SHOWN)	0.4

**UNLESS OTHERWISE SPECIFIED:**  
 TOLERANCES  
 ANGULAR:  $\pm 0.5^\circ$   
 INCH  
 $X \pm .01$   
 $.XX \pm .005$   
 $.XXX \pm .002$   
 MILLIMETER  
 $[X] \pm .3$   
 $[-XX] \pm .12$   
 $[-XXX] \pm .050$   
 MATERIAL  
 FINISH  
 DO NOT SCALE DRAWING

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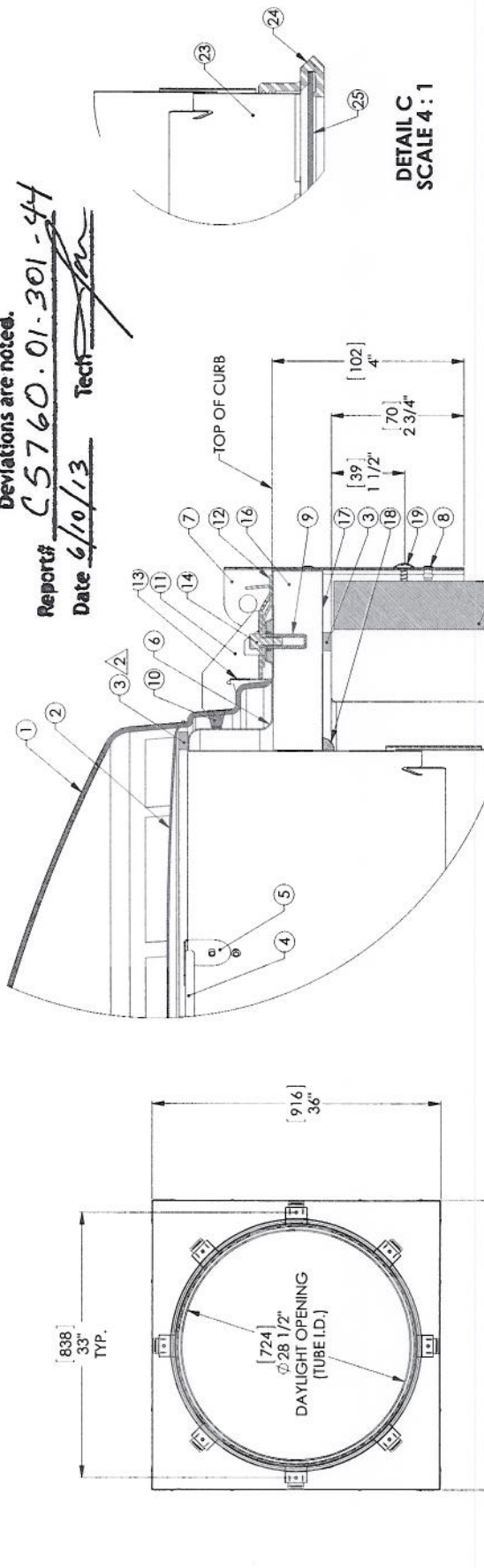
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CHECKED BY	DATE	UNIT MM(INCH)	SCALE 1:24	SHEET 1 OF 1	
INTERPRET DRAWINGS IAW: ASME Y14.5 - 1994					

Test sample complies with these details.  
Deviations are noted.

Report # C5760.01-301-44

Date 6/10/13 Tech [Signature]



**DETAIL C**  
SCALE 4:1

**DETAIL B**  
SCALE 4:1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	508005	GUTTER DOME M74 DS	1
2	510510	INNER THERMAL DISC M74 DS	1
3	400325	CLOSED CELL FOAM 3/16 X 3/8	1
4	488550	STAINLESS STEEL ROD	6
5	400485	SECURITY TAB	6
6	210215	CURB CAP M74 DS	1
7	210705	CORNER BRACKET M74 DS	4
8	700535	PIVET 1/8"	29
9	70019A	PIVET NUT 10-32 CLOSED END	8
10	603285	PILE SEAL	1
11	710105	DOME CLAMP M74 DS	8
12	400695	DOME CLAMP FOOT PLATE M74 DS	8
13	400685	DOME EDGE PROTECTION BAND M74 DS	1
14	700785	SCREW 10-32 X 5/8" HEX FLANGED	8
15	410420	TUBING M74 DS	1
16	500325	INSULATION SECTION, RIGID	4
17	601090	FOIL TAPE	4
18	700360	SEALANT	1
19	700480	SCREW 10 X 2" SMS	16
20	500725	TORSION SPRING M74 DS	2
21	504600	METAL BELT M74 DS	2
22	39020700495	24" / 48" EXTENSION TUBE M74 DS	1
23	420725	DIFFUSER COLLAR M74 DS	1
24	410045	DRESS SPRING SEAL M74 DS	1
25	420985	DIFFUSER M74 DS PRISMA ITC PANEL	1
26	508610	BELT HAIR	2

UNLESS OTHERWISE SPECIFIED:  
DIMENSION TOLERANCE  
FINISHES  
MATERIAL  
DATE

SOLATUBE INTERNATIONAL, INC.  
11111 W. 11TH AVENUE  
DENVER, CO 80233  
WWW.SOLATUBE.COM

DATE: 25 JAN 13  
CHECKED BY: [Signature]  
APPROVED BY: [Signature]

SCALE: 3:1

REV 2  
M74 DS CURB MOUNT  
OPEN CEILING  
M74 DS-O-DPP-FC-L2-REG 2

**SECTION A-A**

NOTE:  
1. CONSECUTIVE METAL BELTS, #21 & EXTENSION TUBES, #22 MAY BE ADDED ACCORDING TO PROJECT LIGHTING REQUIREMENTS  
2. FOAM THICKNESS RANGES FROM 1/8" TO 3/16"





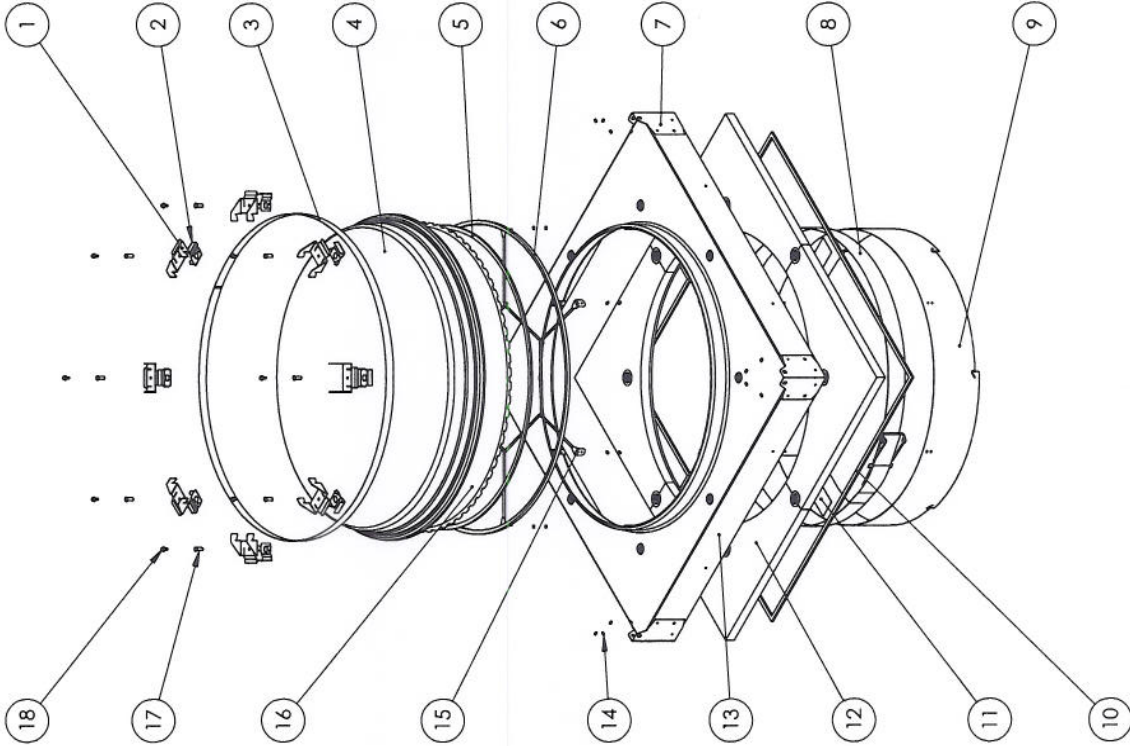
# Architectural Testing

Test sample complies with these details.  
Deviations are noted.

Report# C5760.01-301-44

Date 6/10/13 Tech [Signature]

REVISIONS			
NO.	DATE	REVISED	CHECKED
7-1	1/24/2013	STEVENS	APPROVED



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	400695	DOME C-CLAMP FOOT M74 DS	8
2	710105	DOME C-CLAMP	8
3	400685	DOME EDGE PROTECTION BND M74 DS	1
4	508005	OUTER DOME M74 DS	1
5	600325	CLOSED CELL FOAM 3/16" x 3/8"	1
6	600285	PILE SEAL .27 X .37	7.47
7	210205	CORNER BRACKET M74 DS	4
8	400395	TUBE BELT M74 DS EXT. TUBE FASTENER	1
9	410420	INNER CURB COLLAR	1
10	600325	CLOSED CELL FOAM 3/16" x 3/8"	1
11	601090	FOIL TAPE SECTION	0.011
12	500375	INSULATION SECTION M74 DS CURB	4
13	210215	CURB CAP M74 DS	1
14	700635	RIVET 1/8 X 1/4 AL/ST MULTI	29
15	480015	SECURITY WIRE GUARD M74 DS	1
16	510510	INNER THERMAL DISK M74 DS	1
17	700196	RIVET NUT 10-32 CLOSED END	8
18	700785	HEX HEAD FLANGE BOLT	8
19	700300	SEALANT (NOT SHOWN)	0.8

**UNLESS OTHERWISE SPECIFIED:**

TOLERANCES  
ANGULAR: ±0.5°  
INCH  
X ± .01  
.XX ± .005  
.XXX ± .002  
MILLIMETER  
[X] ± .3  
[XX] ± .12  
[XXX] ± .050  
MATERIAL  
FINISH  
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CHECKED BY: [Blank]  
DATE: 3/12/13  
DATE: [Blank]  
INTERPRET DRAWINGS IAW: ASME Y14.5 - 1994



TITLE: **CURB CAP FLASHING  
DUAL GLAZED ASSY M74 DS**

SIZE: **B**  
PROJECTION: [Symbol] [3rd]  
UNIT: MM [INCH]  
DWG. NO.: **300570**  
SCALE: 1:24  
SHEET 1 OF 1