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Solatube International, Inc.  
2210 Oak Ridge Way  
Vista, CA 92081

Attn: Todd Anderson  
(760)-597-4427

RESEARCH REPORT: RR 25251  
(CSI # 08620)

Expires: April 1, 2016  
Issued Date: February 1, 2014  
Code: 2014 LABC

**GENERAL APPROVAL –Renewal - Solatube Tubular Daylighting Device (TDD)**  
Skylights

## DETAILS

Solatube Tubular Daylighting Device (TDD) Skylights include:

- The Solatube Brighten Up® Series Models 160 DS, 290 DS daylighting systems.
- The Solatube SolaMaster® Series Models 330 DS-O, 330 DS-C, 750 DS-O and 750 DS-C daylighting systems. The “O” and “C” designation refers to Open (O) and Closed (C) ceiling configurations.

The TDD models by tube diameter size are:

- 10 inch diameter: 160 DS
- 14 inch diameter: 290 DS
- 21 inch diameter: 330 DS-O, 330 DS-C, 750 DS-O, 750 DS-C

These TDD models consist of three primary assemblies:

- the roof dome assembly
- reflective tube assembly
- diffuser assembly.

These assemblies are detailed in Figures 1, 2, and 3.

### 1. Roof Dome Assembly

Primary components of the dome assembly are the dome, dome ring or tube ring and flashing.

- 1.1. A single dome manufactured from impact resistant acrylic polymer is utilized on Models 160 DS, 290 DS, 330 DS and 750 DS. The acrylic material is classified as CC2 when tested in accordance with ASTM D635.

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- 1.2. A dome ring (160 DS & 290 DS) manufactured from impact resistant Acrylic polymer or tube ring (330 DS & 750 DS) manufactured from PVC, connects the inner reflective tube, inner dome and outer dome to the flashing. The acrylic and PVC material are classified as CC2 when tested in accordance with ASTM D635.
- 1.3. A powder coated steel dome edge protection band is utilized to protect the dome edge on installations on roof assemblies with fire classifications of A, B or C.
- 1.4. Powder coated metal flashings are self mounting and are available in pitched and flat configurations. For models 160 DS and 290 DS, the flat configuration is available in both 4 and 6 inch lengths. For models 330 DS and 750 DS, only flat configurations in 4, 8 and 11 inch lengths are available. A support flashing with integral curb cap is available for the 290 DS, 330 DS and 750 DS models. Also, a support flashing for non-corrugated metal roof is available for 330 DS and 750 DS

**2. Reflective Tube Assembly**

Reflective tubes and angle adapters have a high reflectance interior tube finish and are manufactured from .015" thick aluminum for 160 DS and 290 DS, and .018" for 330 DS and 750 DS. Two inch wide polymer/foil tape is utilized at all joints between tube sections and at vertical seams of each tube.

**2.1. Daylight Dimmer Assembly**

A switch operated, electrically driven Daylight Dimmer Assembly is available for installation above the bottom tube on 160 DS / 290 DS and above the round-to-square for 330 DS / 750 DS. The Dimmer Assembly is used to restrict natural light from entering the room. See Figure 5.

**2.2. Light Kit Assembly**

Switch operated, electric light kits are available for installation into the bottom tube for the 160 DS and 290 DS models only. The kits contain either an incandescent or fluorescent light bulb. See Figure 4.

**3. Diffuser Assembly.**

The Diffuser Assemblies are either single or dual glazed with acrylic, polycarbonate plastic or 0.16" thick tempered glass. The plastic diffusers are classified as a CC2 plastic material when tested in accordance with ASTM D635. The plastic diffusers have a flame spread index not exceeding 200 and a smoke development index not exceeding 450 when tested in accordance with ASTM E 84.

These are mounted over the Ceiling Ring for aesthetic purposes

The ceiling ring is manufactured from injection molded impact resistant acrylic and is used to connect the reflective tubing and diffusers to the interior room ceiling.

**The approval is subject to the following conditions:**

1. Installation must comply with this report; the manufacturer's published installation instructions and 2014 City of Los Angeles Building Code Sections 2405 and 2610.
2. The maximum allowable loads are as described in Tables 1 and 2.

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3. Solatube Tubular Daylighting Devices are produced in Vista, California, under a quality control program with inspections by Keystone Certification, Inc. (AA-612).

## DISCUSSION

The report is in compliance with the 2014 City of Los Angeles Building Code.

The laminated film attached to the reflective tube assembly is classified as CC1 in accordance with ASTM D635-08.


Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this Approval have been met in the project in which it is to be used.



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RR25251/MSWord2010  
R01/31/14  
2B1/2405/2606/2610

Attachment: Details (8 Pages)

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**Table 1 – Maximum Allowable Design Loads and Applicable Codes**

Model Series	Model No	Dia. (inch)	Dome Thickness (inch)	IBC	
				Wind Loads (psf) <sup>1,2</sup>	Snow Load (psf) <sup>1,2,3</sup>
Solatube Brighten-Up® Series	160 DS	10	0.125	+70 -60	+150
	290 DS	14	0.125		
Solatube SolaMaster® Series	330 DS-O	21	0.168	+70 -70	
	330 DS-C	21	0.168		
	750 DS-O	21	0.210		
	750 DS-C	21	0.210		

<sup>1</sup> Positive (+) loads are directed inward; negative (-) are directed outward.

<sup>2</sup> Values indicated are positive and negative design pressure ratings.

<sup>3</sup> Allowable design loads for consideration of water penetration are limited to those values indicated under Wind Loads.

**Table 2  
 Anchorage Descriptions for Recognized Wind Uplift Design Pressures**

Model #s	Anchorage	Substrate	Anchor Description and Quantity
160 DS 290 DS	Metal Flange to wood curb	SPF (S.G. ≥ .42) wood curb	Qty 8 #10 x 2" Screw
	Metal Flange to wood deck	5/8" Type 2 Plywood	Qty 8 #10 x 2" Screw
	Metal Flange to Metal Deck	22 gauge steel 33ksi Min Yield	Qty 8 #10 TEKS
330 DS-O <sup>1</sup> 330 DS-C <sup>1</sup> 750 DS-O 750 DS-C	Metal Flange to wood curb	SPF (S.G. ≥ .42) wood curb	Qty 16 #10 x 2" Screw
	Metal Flange to wood deck	5/8" Type 2 Plywood	Qty 16 #10 x 2" Screw
	Metal Flange to Metal Deck	22 gauge steel 33ksi Min Yield	Qty 16 #10 TEKS

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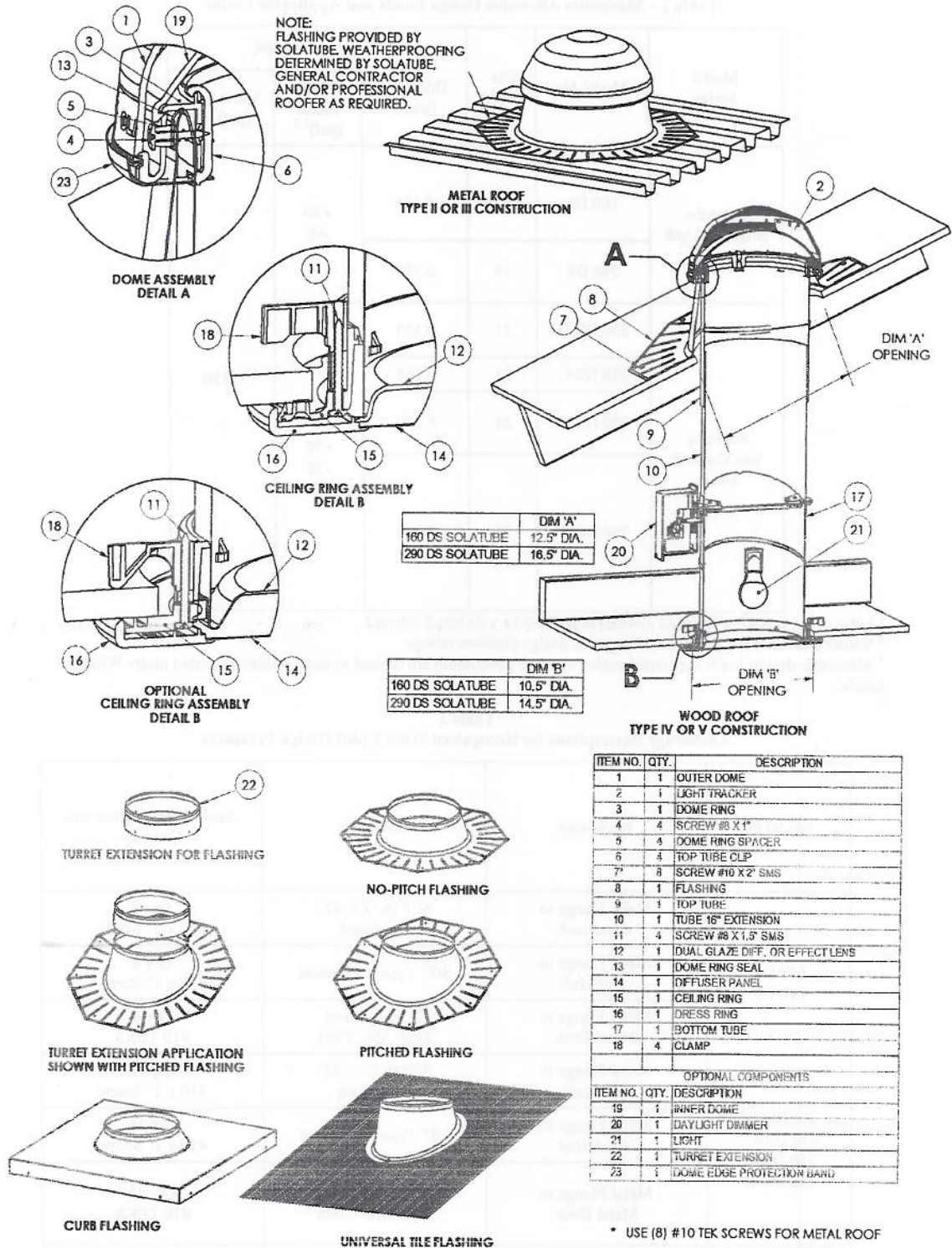
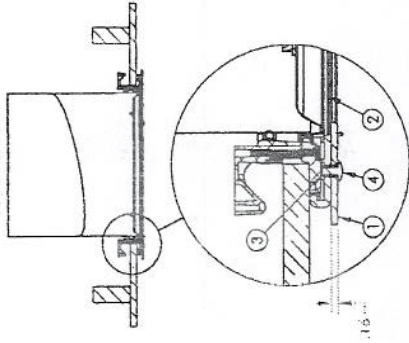


FIGURE 1 - 160 DS & 290 DS SOLATUBE WITH DETAILS

REVISIONS					
REV.	ECO	DATE	REVISED	CHECKED	APPROVED
-	-	SEE SH1	-	-	-

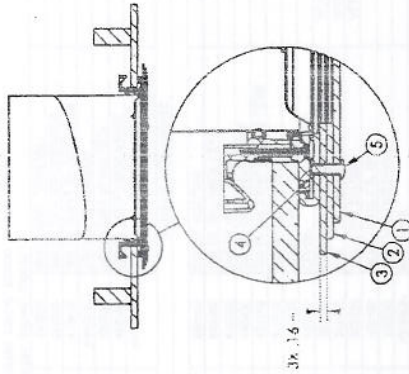
# 160 DS AND 290 DS DECORATIVE DIFFUSER OPTIONS

'OPTIVIEW' DIFFUSER ASSEMBLY



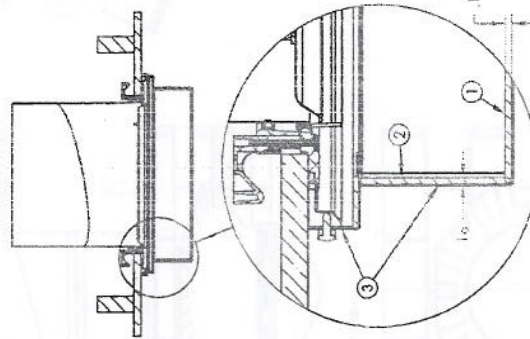
OPTIVIEW DIFFUSER ASSEMBLY COMPONENTS				
ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	400290	GLASS DISK CENTER CLEAR 290 DS	TEMPERED GLASS
2	1	400880	DIFFUSER 290 PANEL OPTIVIEW	PC
3	3	700915	SPANNER NUT	STAINLESS STEEL
4	3	700925	SHOULDER SCREW M5	STAINLESS STEEL

'TIER DROP' DIFFUSER ASSEMBLY



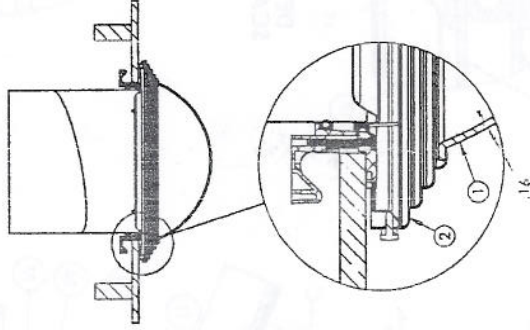
TIER DROP DIFFUSER ASSEMBLY COMPONENTS				
ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	400295	GLASS DISK 290 DS	TEMPERED GLASS
2	1	400296	MIDDLE GLASS RING 290 DS	TEMPERED GLASS
3	1	400297	TOP GLASS RING 290 DS	TEMPERED GLASS
4	3	700915	SPANNER NUT	STAINLESS STEEL
5	3	700925	SHOULDER SCREW M5	STAINLESS STEEL

'QUADRA FROST' DIFFUSER ASSEMBLY



QUADRA FROST DIFFUSER ASSEMBLY COMPONENTS				
ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	400299	290 DS SQ. BOTTOM GLASS	TEMPERED GLASS
2	4	400294	290 DS SQ. SIDE GLASS	TEMPERED GLASS
3	1	492914	290 DS SQ. FRAME BRACKET ASSY.	STEEL

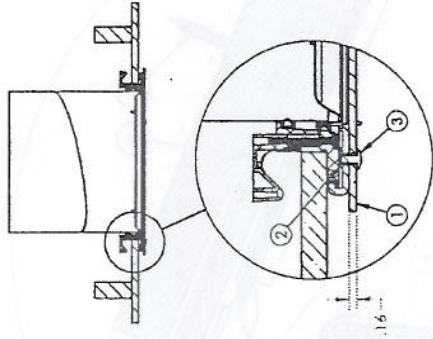
'AURORA GLO' DIFFUSER ASSEMBLY



AURORA GLO DIFFUSER ASSEMBLY COMPONENTS				
ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	400292	290 DS GLASS ROUND	TEMPERED GLASS
2	4	492902	290 DS ROUND ROWL ROSE ASSY.	STEEL

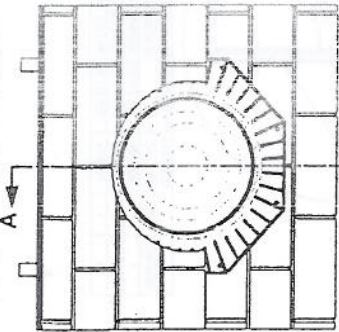
'JUST FROST' DIFFUSER ASSEMBLY COMPONENTS				
ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	400295	GLASS DISK 290 DS	TEMPERED GLASS
2	3	700915	SPANNER NUT	STAINLESS STEEL
3	3	700925	SHOULDER SCREW M5	STAINLESS STEEL

'JUST FROST' DIFFUSER ASSEMBLY



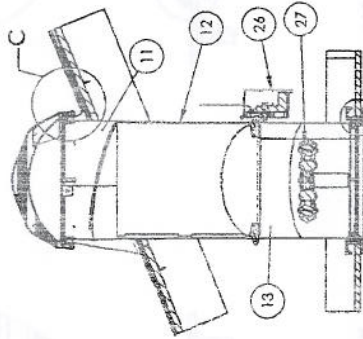
# 290 DS DECORATIVE DIFFUSER OPTIONS

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 P.E. Solutube Tubular Daylighting Devices



141 #8 SMS FASTENERS

FLASHING SHOWN WITH OPTIONAL 2'-4" TALL TURRET EXTENSION



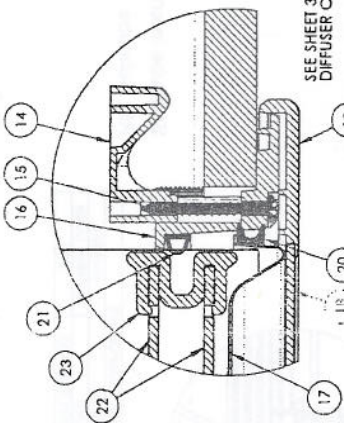
SECTION A-A

ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	410820	DOME 290 DS	PMMA
2	1	410930	LIGHTFRACHTER/LECTOR 290 DS	ALUMINUM LAMINATE
3	1	410800	DOME RING 290 DS	PMMA
4	1	600320	DOME RING SEAL 290 DS	EPDM FOAM
5	4	700240	SCREW #8 X 1" SMS	STEEL
6	4	410730	DOME RING SPACER	POLYAMIDE
7	4	410750	TOP TUBE CLIP	PMMA
8	1	VARIABLE	FLASHING	STEEL
9	1	700280	SEALANT URETHANE	URETHANE
10	8	700480	SCREW #10 X 2" SMS	STEEL
11	1	302220	TOP TUBE 290 DS	ALUMINUM LAMINATE
12	1	301810	EXT. TUBE 197 290 DS	ALUMINUM LAMINATE
13	1	302120	BOTTOM TUBE 290 DS	ALUMINUM LAMINATE
14	4	410220	CLAMP	POLYAMIDE
15	4	700450	SCREW #8 X 1.57 SMS	STEEL
16	1	410415	CEILING RING 290 DS	PMMA
17	1	421345	290 DS NATURAL EFFECT LENS	ZET
18	1	410630	290 DS DIFFUSER PANEL	PMMA
19	1	410620	DRESS RING 290 DS	PMMA
20	1	600290	290 DS DIFFUSER SEAL	EPDM FOAM
21	1	600445	D-SEAL, HOLLOW	EPDM FOAM

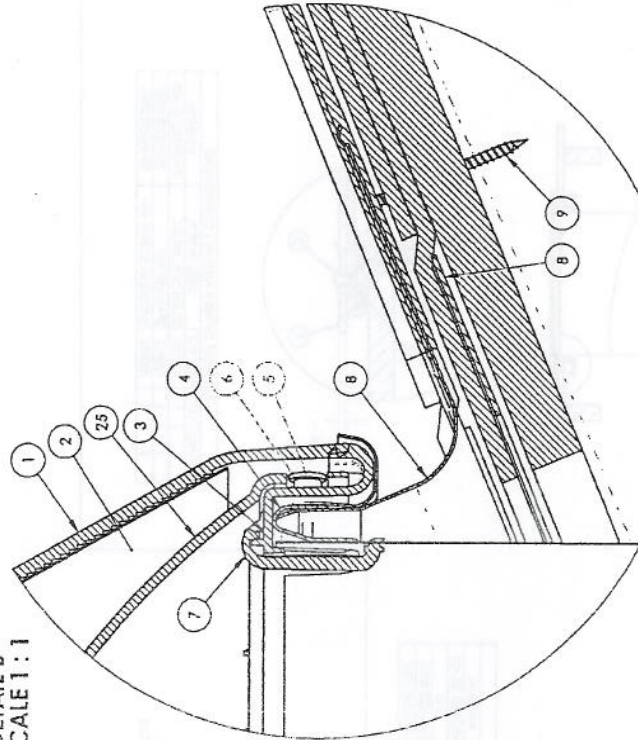
OPTIONAL COMPONENTS		
ITEM NO.	QTY.	DESCRIPTION
22	2	290 DS INSULATION PANEL
23	4	INSULATION PANEL CLIP
24	1	TURRET EXTENSION
25	1	290 DS DOME SHOCK RIBBER
26	1	290 DS DAYLIGHT DIMMER
27	1	UNIVERSAL LIGHT KIT

\* PMS 200760, 200501, 200445, 200630  
 \*\* PMS 230450, 230760, 230540, 230550, 230590, 230574

REV		DATE		REVISIONS	
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A	16 FEB 09	MERCADO			
B	20 SEP 12	CSTEVENS			



DETAIL B  
SCALE 1:1



DETAIL C  
SCALE 1:1

RR 25251  
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**SOLATUBE.**  
 SOLATUBE INTERNATIONAL  
 10000 W. 10TH AVENUE  
 DENVER, CO 80231

TITLE: **290 DS (14") SOLATUBE ASSY**  
**PITCHED FLASHING**  
**290-PF-HC-STD**

DWG. NO. **900520**  
 SHEET NO. **B**

DATE: **8/11/10**  
 DRAWN BY: **STEVENS**  
 CHECKED BY: **STEVENS**  
 APPROVED BY: **STEVENS**

SCALE: **1:10**  
 SHEET 1 OF 3

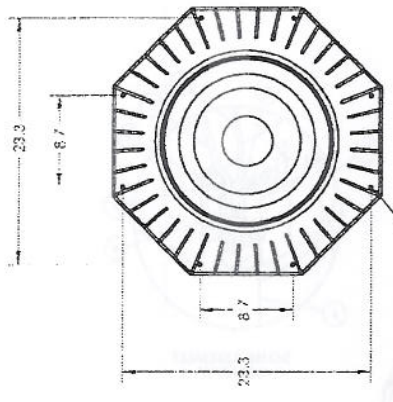
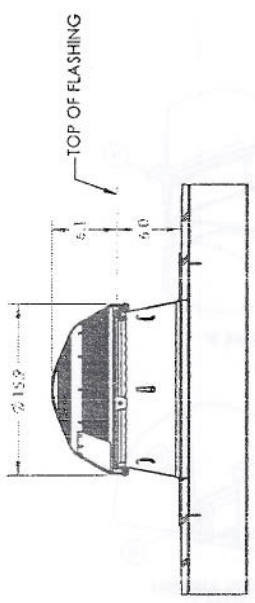
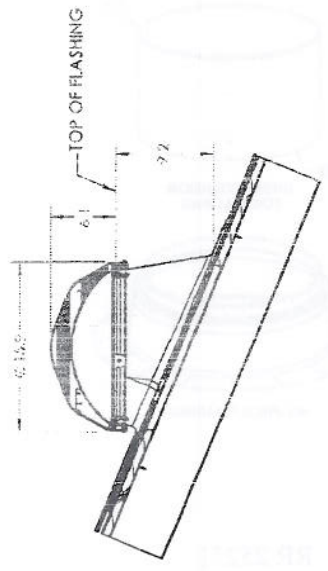
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TOLERANCES UNLESS OTHERWISE SPECIFIED:  
 ANGULAR: 10.5°  
 MILLIMETER: .005  
 INCH: .005  
 XX 1: .01  
 XXX 1: .25  
 XXXX 1: .12

DO NOT SCALE DRAWING

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REVISIONS				
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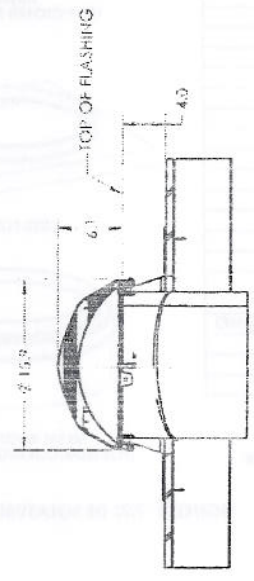


FLAT 6"

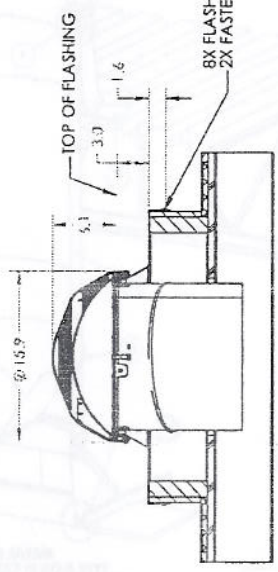
PITCHED

8X FLASHING FASTENERS

FLASHING FASTENER SPACING  
 FLAT 4", FLAT 6" & PITCHED



FLAT 4"



CURB

8X FLASHING FASTENERS,  
 2X FASTENERS PER SIDE

DWG. NO.	REV.
900520	B
SCALE 1/8"	SHEET 2 OF 3





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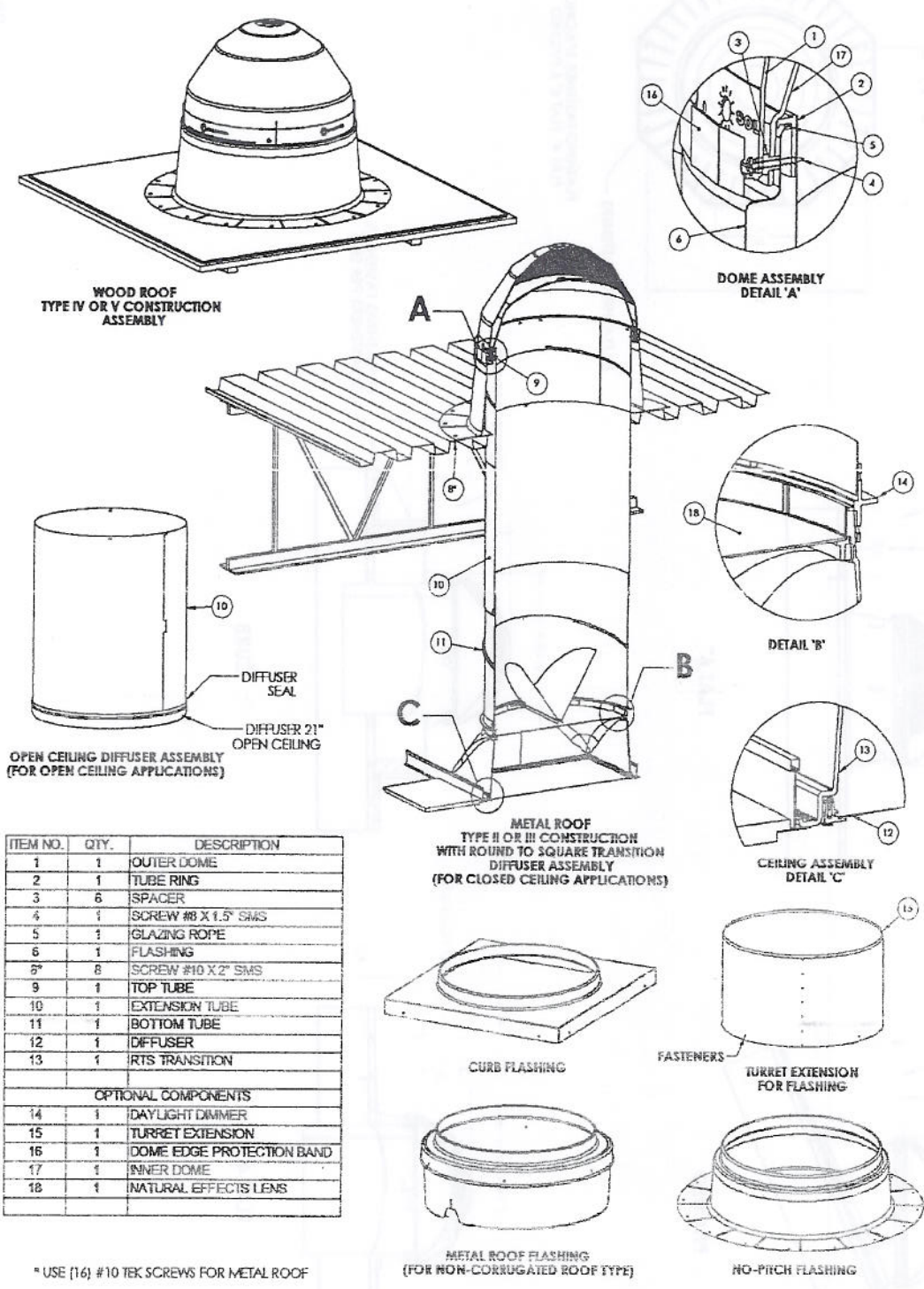
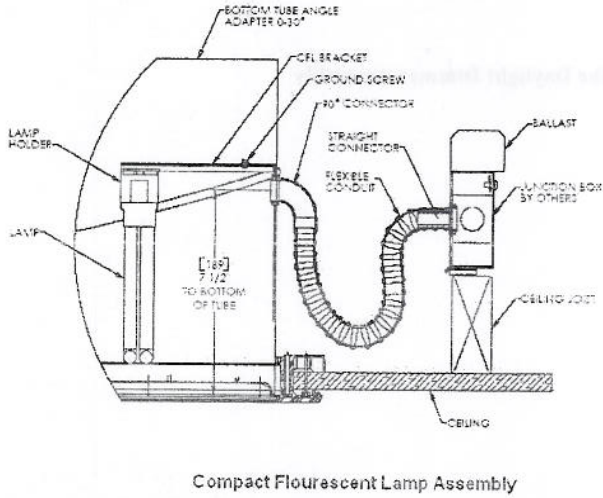
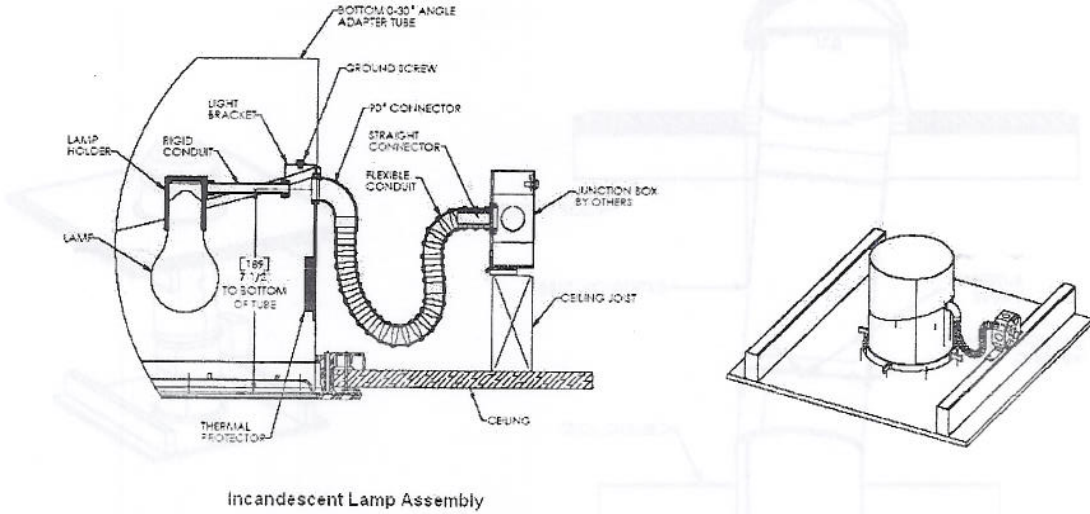


FIGURE 3 - 750 DS SOLATUBE WITH DETAILS

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Notes:  
 1) Evaluation of these Light Fixtures for compliance to applicable electrical codes is not part of this report.

Figure 4 - Typical Solatube Light Kit Assemblies

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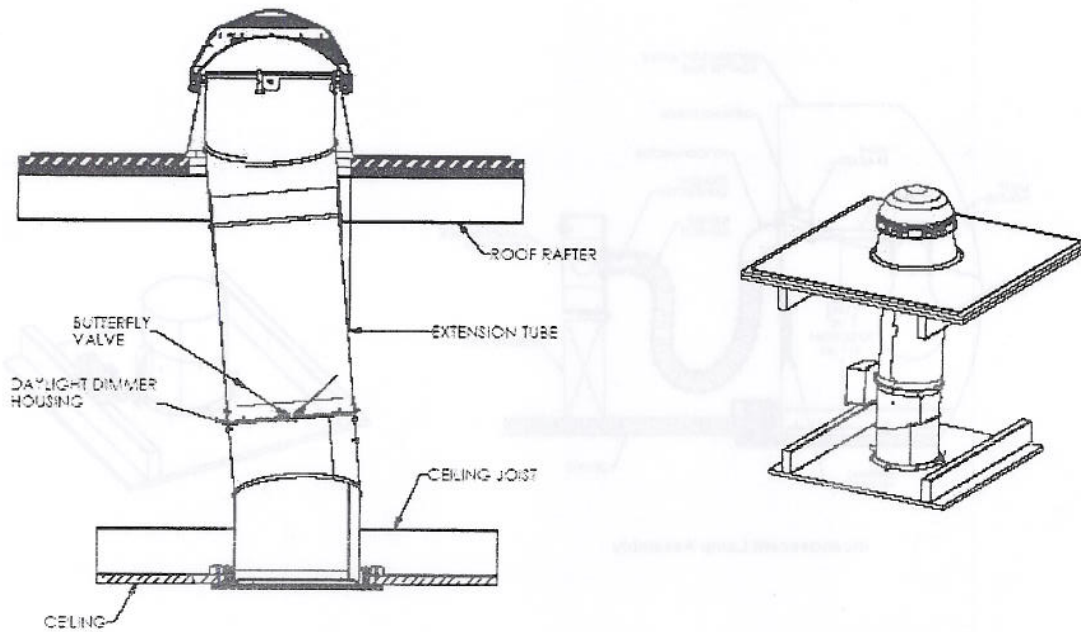


Figure 5 - Typical Solatube Daylight Dimmer Assembly