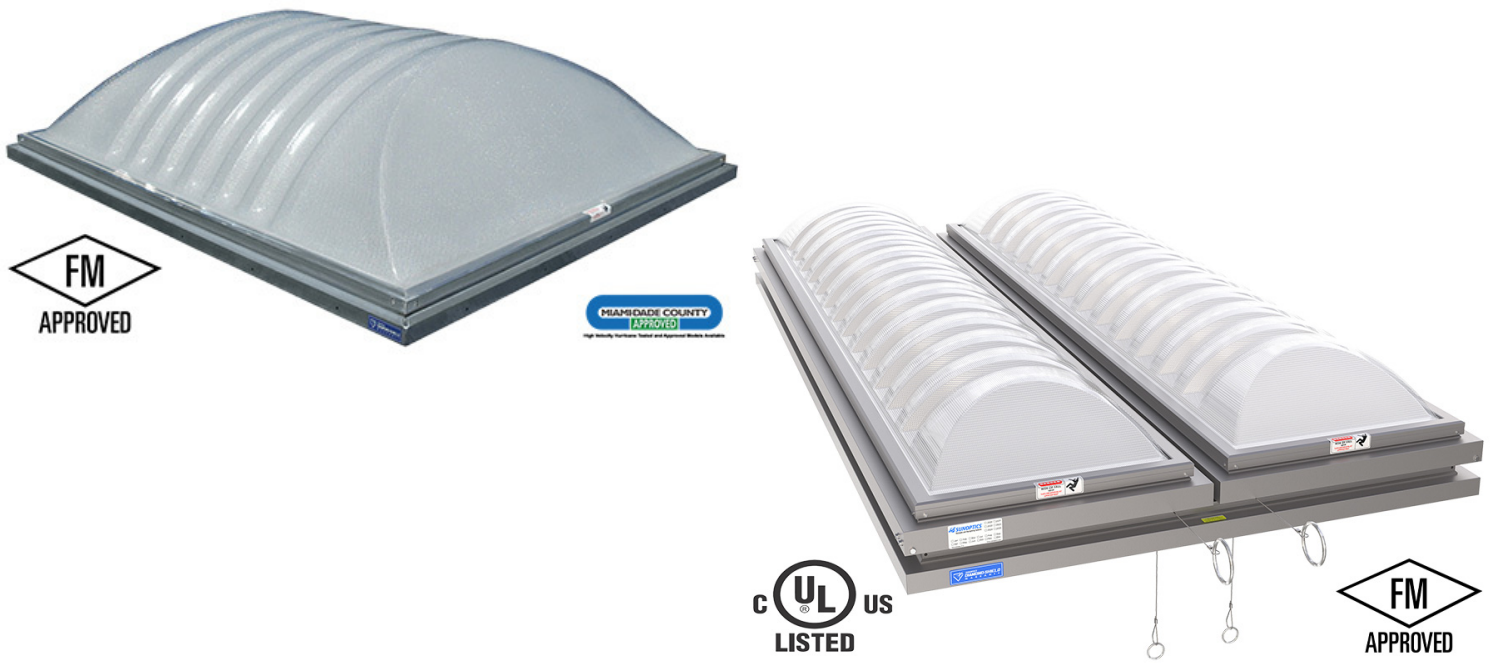


ON-SITE FIELD INSPECTION PROCEDURES SKYLIGHTS / SMOKE VENTS



USERS INSTRUCTIONS

The information presented in this service guide is generic in nature, it can be applied to inspections /servicing skylights systems. This service guide contains information, illustration of the following topics:

Safe Practice Requirements for Servicing / Inspections of Skylight Systems

IMPORTANCE OF SAFETY



**THIS MANUAL IS TO BE USED BY SUNOPTICS FIELD
TECHNICIANS TO SUPPORT SYSTEM INSPECTIONS**

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WARNING / CAUTION
IMPORTANT SAFETY INSTRUCTIONS

PLEASE READ: This document is being provided to you as a helpful tool. It is not a substitution for electrical codes, safety codes or best engineering practices. It is your responsibility to ensure your safety, follow all safety rules (including those mandated by the Safety Officer in the facility you are visiting) and follow the instructions of the plant personnel that will accompany you on your visit. Please note that each skylight installation / roofing application are different and unique. Safety must always be your first priority. Never attempt to work around any electrical installations when not accompanied by electrical or maintenance personnel who are familiar with the plant and the electrical system. You always have the right to refuse to work on an installation area if it appears to be unsafe even if accompanied by plant personnel. However, any document and guidance is not a substitution for an escort by electrical or maintenance personnel or safety codes and practices in the facility you are visiting.

- TO REDUCE THE RISK OF DEATH, PERSONAL OR PROPERTY DAMAGE FROM FIRE, ELECTRICAL SHOCK, FALLING PARTS, CUTS/ABRASIONS, AND OTHER HAZARDS PLEASE READ ALL WARNINGS AND INSTRUCTIONS
- TO AVOID THE RISK OF FIRE OR ELECTRICAL SHOCK, FIXTURE MUST BE INSTALLED IN COMPLIANCE WITH ALL APPLICABLE NATIONAL AND LOCAL ELECTRICAL / BUILDING CODES FOR CODE INTERPRETATION, CONSULT LOCAL CODE AUTHORITY
- BEFORE INSTALLING, SERVICING OR PERFORMING ROUTINE MAINTENANCE UPON THIS EQUIPMENT, FOLLOW THESE GENERAL PRECAUTIONS
- SERVICING OF THIS EQUIPMENT SHOULD BE PERFORMED BY A QUALIFIED LICENSED ELECTRICIAN AND MECHANICAL TECHNICIAN
- MAINTENANCE OF THE SKYLIGHTS SHOULD BE PERFORMED BY PERSON(S) FAMILIER WITH THE SKYLIGHT INSTALLATIONS, ROOFING INSTALLATION, CONSTRUCTION, OPERATION AND ANY HAZARDS INVOLVED
- MAKE SURE THAT ALL ELECTRICAL AND GROUNDED CONNECTIONS ARE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ANY APPLICABLE LOCAL CODE REQUIREMENTS
- WEAR ALL PPE EQUIPMENT AS REQUIRED AT ALL TIMES WHEN SERVICING OR PERFORMING MAINTENANCE

Personal Protective Equipment (PPE) Requirements

- ✓ Hard Hat
- ✓ Ear Plugs
- ✓ Safety Glasses
- ✓ Safety Vest
- ✓ Steel Toe Safety Shoes
- ✓ Safety Gloves
- ✓ Safety Harness
- ✓ Shock Absorbing Lanyard
- ✓ Safety Tie Off
- ✓ Two Way Standing Seam Anchor
- ✓ Knee Pads

Additional Materials Required for PQM Kit

- ✓ Pocket Flashlight
- ✓ Pocket Mirror
- ✓ Binoculars
- ✓ Utility Knife
- ✓ Tape Measure
- ✓ Note Pad
- ✓ Permanent Marker
- ✓ Cordless Driver & Bits
- ✓ Cloth to clean & inspect lens

Skylight Inspection Site Procedures

This section will cover the procedures required for inspection and testing of a Skylight System

Pre – Inspection Procedures:

Step 1: Insure that you meet all of the PPE equipment requirements prior to entering the customer site / installation work area. Reference Page #4

Step 2: Make contact with the service manager or appropriate manager on duty once you have arrived at the site

Step 3: Confirm any special safety requirements / training needed to be completed prior to start of the inspections

Step 4: Have the Service manager open any secured hatch opening for servicing of the skylights

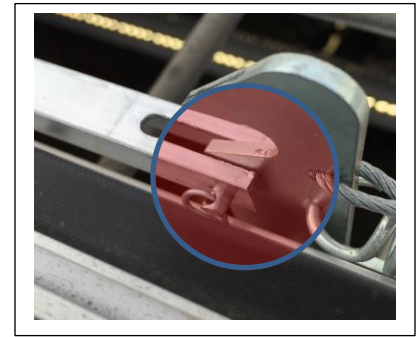
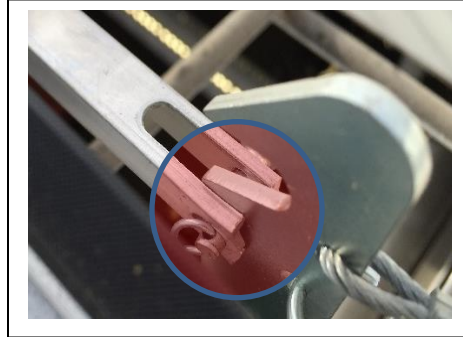
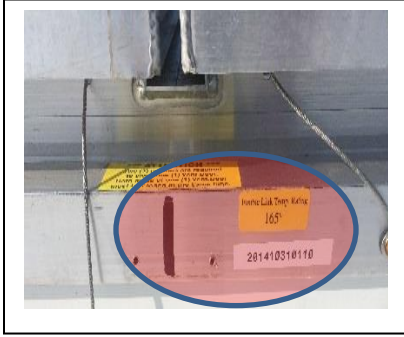
Step 5: Inspect the conditions of the roof installation to insure the area is safe to perform skylight inspections

Reporting / Documenting Procedures:

It is critical that any issues identified during the inspections, installation errors, defects and required testing is documented. When an issue is discovered, it first needs to be documented, which includes pictures and taking notes. Pictures should be as clear and focused on the defect identified. Take as many notes as possible including comments made by contractors, end customer that may support the claim

Step 1: During an inspection if a defect has been identified

- A) First photograph the hand written unit number, this will act as a place holder to identify what unit had the defect during the review process
- B) Complete visual inspection of skylight including the installation of the skylight for defects
- C) Clearly photograph the defect identified, this defect should be centered in the frame clearly identifying the defect in its entirety
- D) Take as many photos applicable regarding the defect
- E) If the unit can be repaired, take photos of the repairs that have been completed
- F) If replacements / materials are required, contact post sales team to address what is required to be ship as the replacement to support the defect
- G) Complete a field service report after completion of the site visit, this should also include photos and a summary sheet of each system inspected



Standard Skylight Visual Inspection Procedures

Step 1: Identify each skylight to be inspected by placing a number on the end of the skylight using a permanent marker
Place the number next to the serial number/product ID label previously installed on the skylight

Step 2: Make a complete visual inspection of the skylight installation to insure that the skylight has been installed securely to the curb

- A)** Insure that the skylight has been correctly and fully seated onto the curb assembly. Check to insure that it is level, and center on the curb so that no pressure has been applied to the skylight frame during the installation
- B)** Insure that all mounting screws have been installed, also note if any screws have been over tighten and causing damage to the bead frame and lens. Also check to insure the correct screws have been used to install the units
- C)** Inspect for cracks /crazing in the lens that could be related to shipping damage, installation or manufacturing defect
- D)** Inspect for deep scratches (Catches your finger nail)
- E)** Damaged or bent bead rails related to shipping damage or installation due to over tighten of the mounting screws
- F)** Inspect the lens and bead rail for defects, including condensation or moisture, water between the lenses, note any signs water was present including: (algae, mold and stains)
- G)** Insure that the lens has not been cut too short to fit the bead rail
- H)** Bead not fully secured causing a gap between bead and lens

Note: if no visual issues have been identified with steps #2 (A-H) then proceed with step #3
Refer to Page #8 for Photo Reference

In some cases, you may need to remove one of the skylights to determine where the water is entering the facility. Insure that you have the required PPE equipment in place before proceeding with the following steps

If there are no burglar bars installed, you must make sure that no one is working directly under the skylight that you will be serving. Also extreme caution must be used as to not drop any materials down through the skylight area during serving after the skylight has been removed. Make sure that all safety procedures and PPE equipment are followed

Step 3: Remove all mounting screws used to secure the skylight to the curb assembly

Step 4: Clear all equipment/ tools away from the area of the skylight being removed

Step 5: Carefully lift off the skylight by lifting straight up until the skylight is clear from the curb assembly

- A)** Remove slowly as not to damage the curb seal between skylight and curb
- B)** Carefully place the skylight over to the side of the curb assembly

Step 6: Complete a visual inspection of the internal lens of the skylight for damage to the lens or bead rail

Step 7: Inspect the seal/gasket that was applied to the curb to insure it has been installed correctly

- A)** No over lapping of gasket materials that would create a void
- C)** No tears in the gasket material
- D)** No gas between section of the gasket materials
- E)** Check to see if a good seal has been completed around the curb area

Step 8: Re-install the skylight if no issues have been identified or repairs required

Note: Take a picture of the skylight number that you have placed on the skylight, then take pictures off any defects that you may have identified during the inspection. Log the inspection and any notes related to the defects identified to support your findings

Smoke Vent Visual Inspection Procedures

This section will cover the procedures required for inspection and testing of the Smoke Vent Systems

Step 1: Have the Service manager open any secured hatch opening for servicing the Smoke Vent Systems

Step 2: Inspect for visual placement of the “Roof Hatch Sign” at the entrance of the roof opening

Note: Report any missing signs to the Manager on Duty prior to leaving the site visit

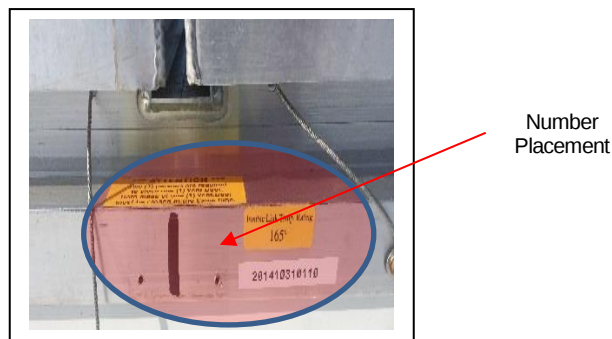
Step 3: Locate the closing bar needed to test the smoke vent systems

Note: Report to the Manager on Duty that the closing bar cannot be located before leaving the site visit

Step 4: Inspect the conditions of the roof installation to insure the area is safe to perform smoke vent inspections

Visual Inspection Procedures:

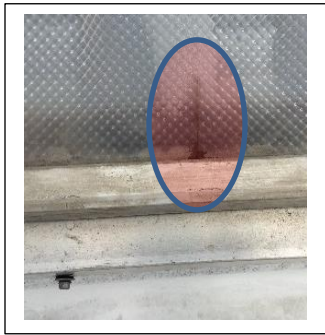
Step 1: Identify each smoke vent to be inspected by writing a number on the end of the skylight using a permanent marker. Place the number next to the serial number/product ID label previously installed on the smoke vent



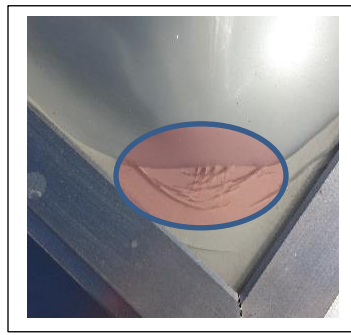
Step 2: Make a complete visual inspection of the smoke vent installation to insure that the smoke vent has been installed securely to the curb assembly

- I) Insure that the smoke vent has been correctly and fully seated onto the curb assembly. Check to insure that it is level, and center on the curb so that no pressure has been applied to the skylight frame during the installation
- J) Insure that all mounting screws have been installed, also note if any screws have been over tighten and causing damage to the bead frame and lens. Also check to insure the correct screws have been used to install the units
- K) Inspect for cracks /crazing in the lens that could be related to shipping damage, installation or manufacturing defects
- L) Inspect for deep scratches (Catches your finger nail)

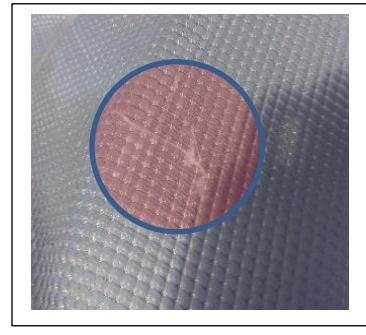
- M)** Damaged or bent bead rails related to shipping damage, installation or due to over tighten of the mounting screws
- N)** Inspect the lens and bead rail for defects, including condensation or moisture, water between the lenses, note any signs water was present including: (algae, mold and stains)
- O)** Insure that the lens has not been cut too short to fit the bead rail
- P)** Bead not fully secured causing a gap between bead and lens



Crack / Crazing



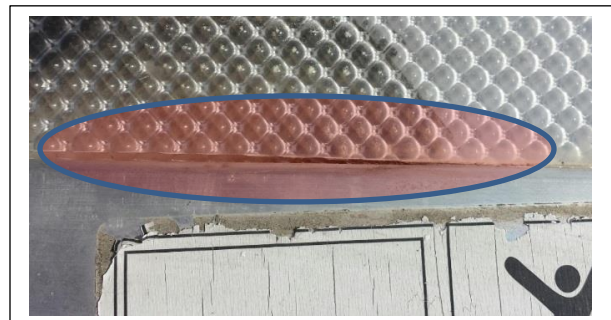
Crack / Crazing



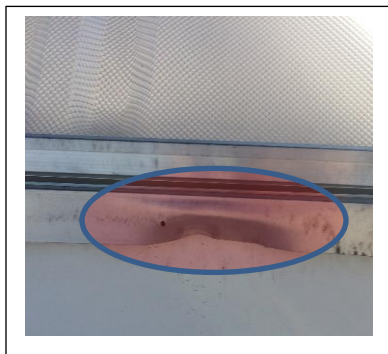
Deep Scratches
(Catches Finger Nail)



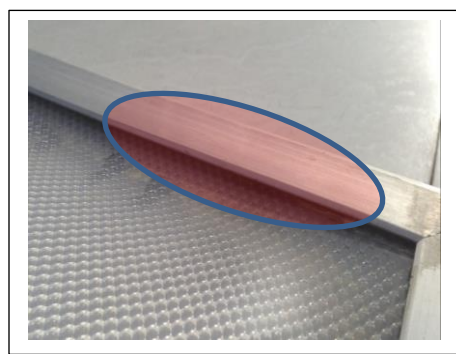
Water Between lens



Lens cut to short, Lens Visible Outside of Bead Rail



Damaged Frames



Bead Not Fully Secured, Gap Between Bead
and Lens



Smoke Vent Testing / Mechanical Inspection Procedures

Step 1: Start by pulling in a downward motion on the release cable to open the “left side door only” of the smoke vent

Note: Make sure that all personnel are standing clear with this step is completed

Note: If there are no burglar bars installed, you must make sure that no one is working directly under the skylight that you will be serving. Also extreme caution must be used as to not drop any materials down through the skylight area after the skylight has been removed.

Step 2: Inspect all hardware including damper, pins, and hairpins

Step 3: Complete a visual inspection of the inter lens for cracks or damage

Step 4: Inspect the trigger assembly for function



Step 5: Complete visual inspection to insure the correct fusible link has been installed and match the label placed on the outside of the unit

Step 6: Inspect the condition of the connecting rod assembly for damage or breakage

Step 7: Inspect the location of the clevis pin on both ends of the closed right door assembly

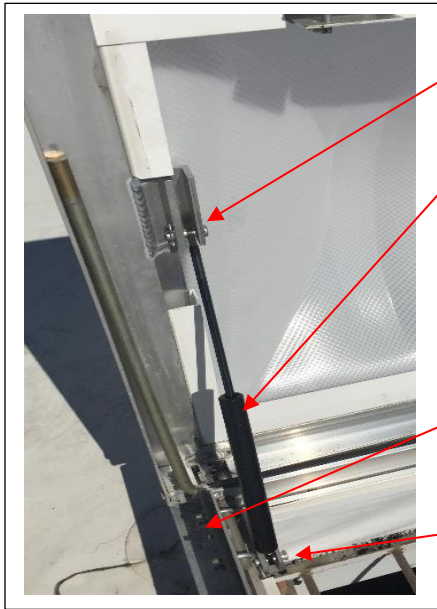
Step 8: While using a mirror inspect for a good seal between curb assembly and smoke vent

Step 9: Need to reset the left hatch door using two operators to secure correctly

Note: this requires to operators one on each end push simultaneously downward motion until the door has re-latched to the frame assembly. Not doing this can cause damage / breakage to the connecting rod assembly

Note: 30 lb. rated smoke vents require additional force to close correctly while using the closing bar

Step 10: Complete the same procedures in steps #1 through #9 for the right-side door of the smoke vent system



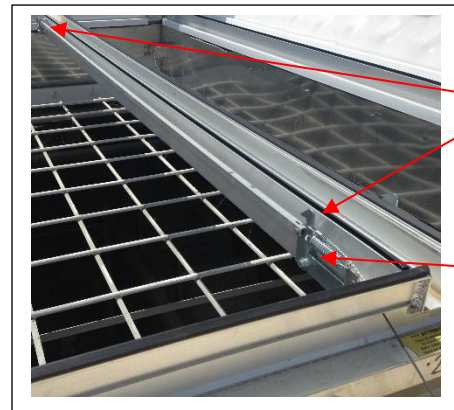
Damper Clevis Pin & Hairpin

Damper

Vent Dorr Bolt & Lock Nut

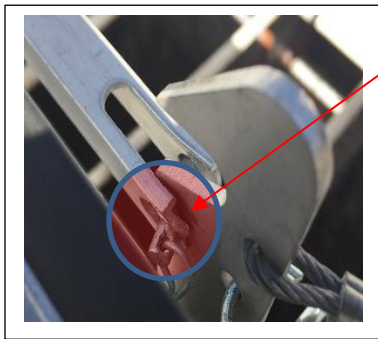
Hinge Plate Bolts and Nuts

Damper Clevis Pin & Hairpin

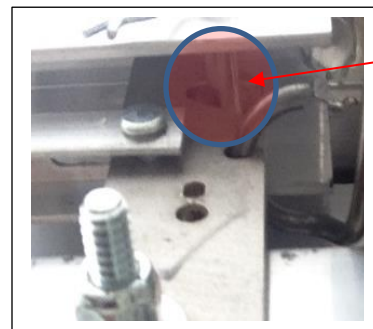


Triggers

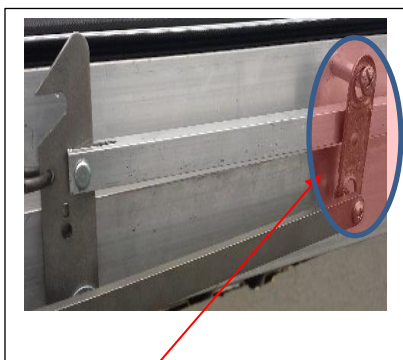
Clevis Pin & Hairpin



Damaged Connecting Rod



Incorrect Location

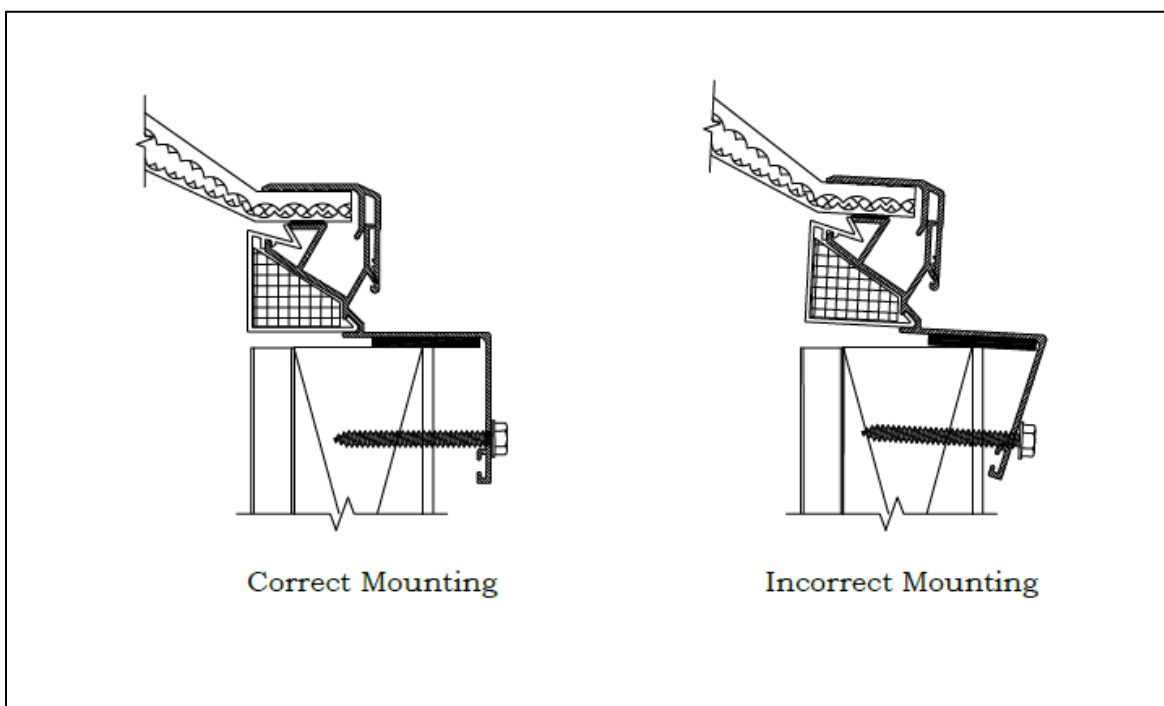


Fusible Link (Link Should Match Temperature Label on Outside of Unit)



Appendix "A"

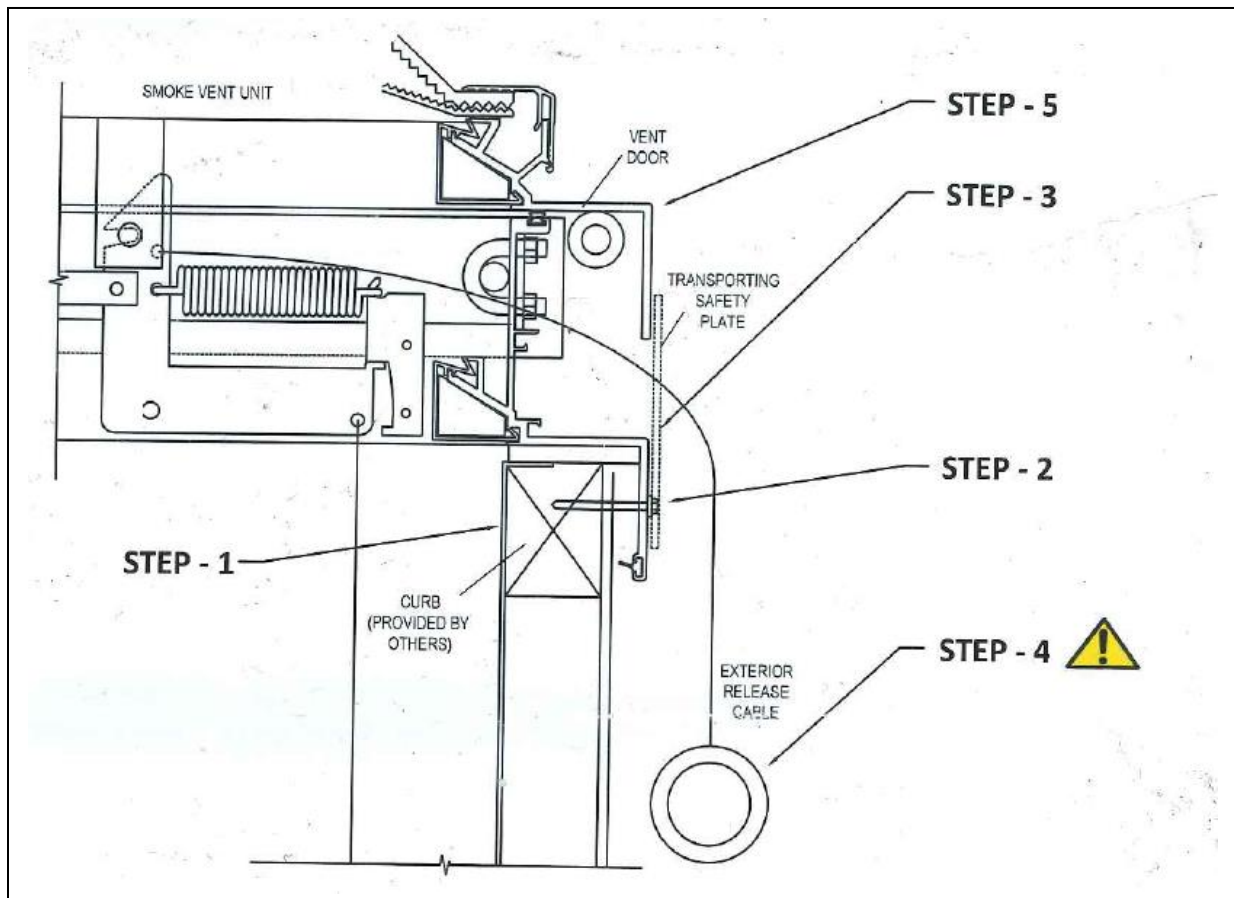
Correct mounting of the skylight to the curb assembly



Note: Insure the correct mounting screws have been used and check to see that the drive screws are just snug to the flange, making sure not to distort the skylight frame

Appendix "B"

SVT Industrial Smoke Vent

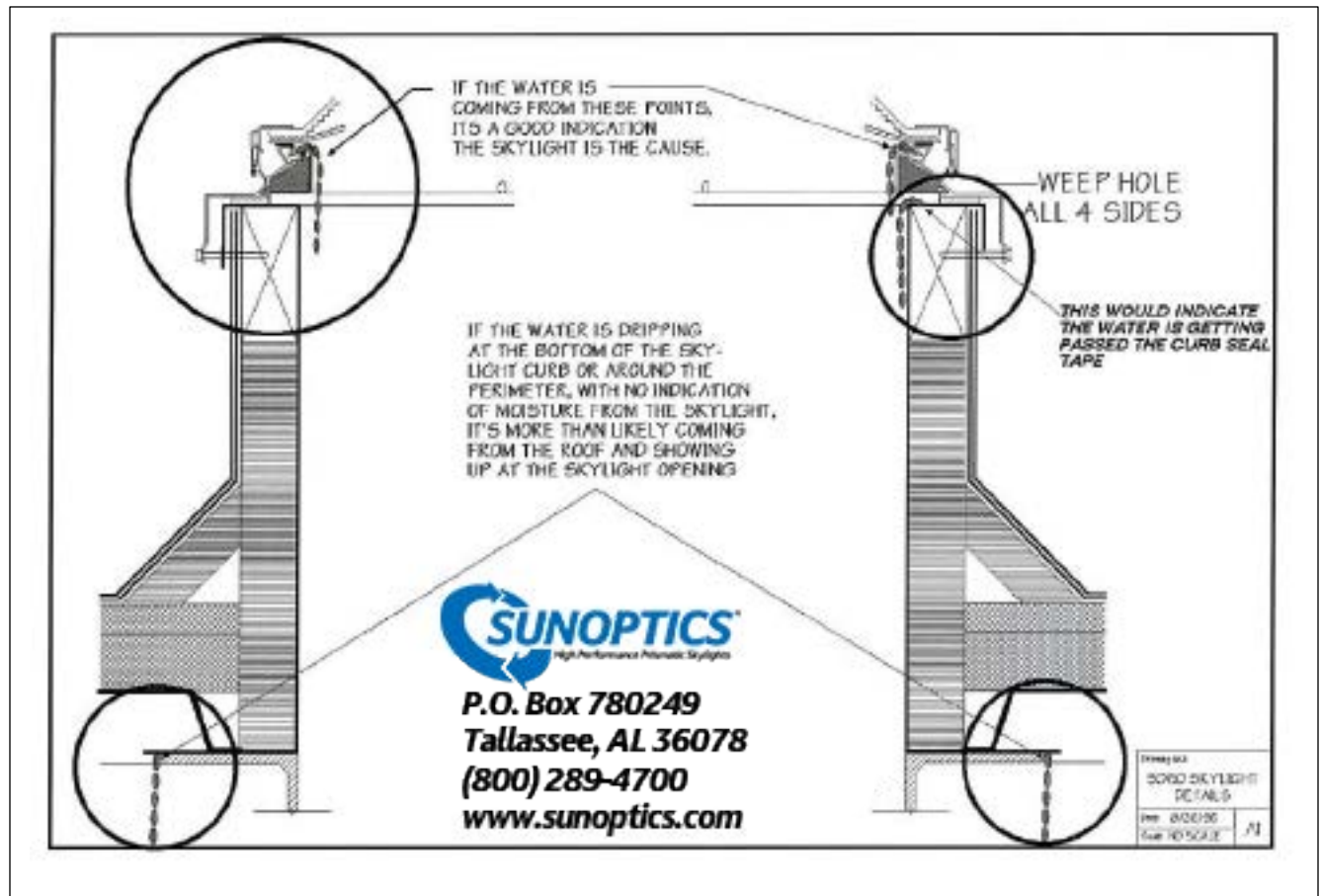


Note: Pull the exterior release cable to test each venting door section for proper operation.

Warning: All personnel need to stand clear of the vent door sections when testing the units

Appendix "C"

Water ingress issues



Note: To locate the root cause of a leak, very close observation is required

Appendix "D"

Water Ingress



Note: Previous inspections has identified a root cause to water ingress between the curb and skylight. Photos reflect what to look for as a point of entry between the skylight and curb assembly. The photos show that the TPO membrane was not cut properly and does not allow for a good seal with the curb seal tape



Note: The photo reflects that the having a break in the curb seal tape will also be a root cause failure for water ingress

Appendix “E”

Water Ingress



Note: The photos reflect failures types in the curb installation that can contribute to be a root cause failure for water ingress