Skylight Installation Manual



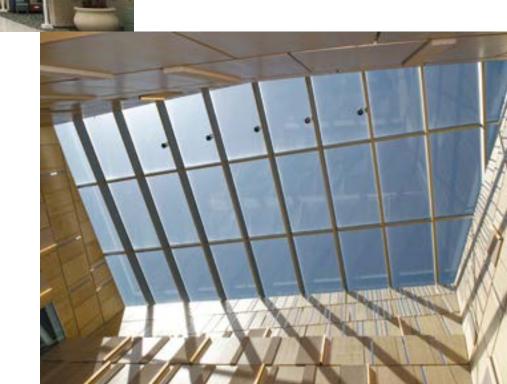
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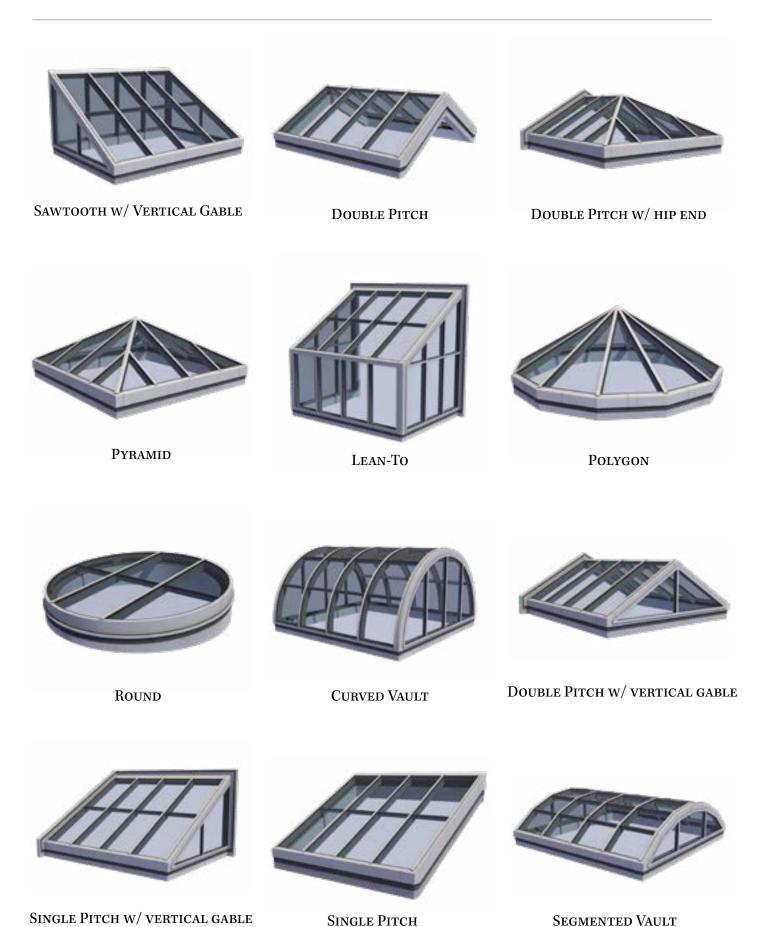
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STROUD HIGH SCHOOL STROUD, OKLAHOMA

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Introduction

This manual is intended to guide the installer through the installation of an Acurlite Structural Skylights, Inc skylight. If you do not have experience in skylight installation it is important that this manual and your shop/erection drawings be reviewed thoroughly before any field work begins. Due to the wide variety of skylight designs and site conditions, all situations cannot be covered. However we will illustrate typical procedures which in conjunction with your shop/erection drawings, can be applied to most situations. If you require assistance beyond the scope of this manual feel free to contact our engineering department at 570.759.6882.

What to do first:

- Thoroughly review this installation manual, the project specific shop/erection drawings and the bill of materials.
- The shop/erection drawings and bill of materials are typically packed into one of the hardware cartons.
- ✓ It is important to become familiar with the terminology being used to identify the components and parts. This will be helpful in the event you need to contact the factory for assistance.
- ✓ Make note of any items not being provided by Acurlite and acquire these items prior to start of any field operations.

Legend



Fragile



Cutting



Fall Hazard



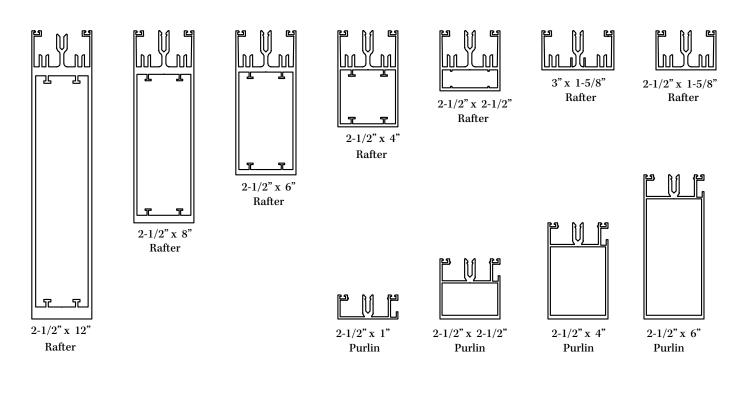
Pinch

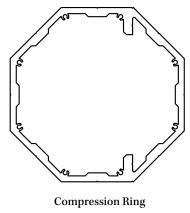


Crush Hazard

DOWSIL[™] products or equivalent must be used. Please check with sealant manufacturer for compliance.

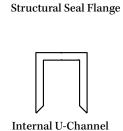
Standard Extrusions and Accessories







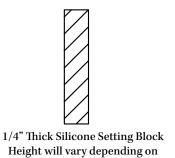
Cover/ Beauty Cap



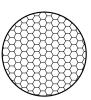


Standard Silicone Gasket





glazing thickness.



Backer Rod 7/8" Dia. Standard May vary depending on glazing thickness.

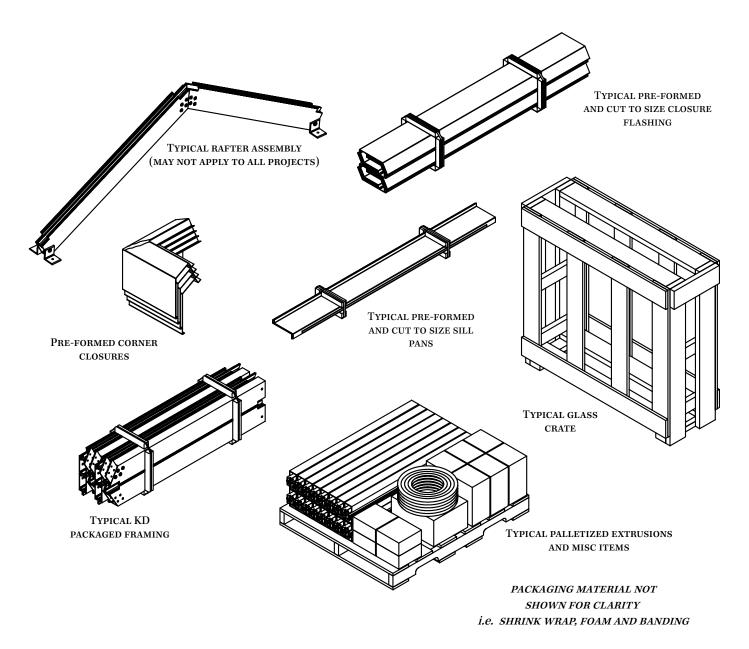
Typical Fasteners

1		1	,
DESCRIPTION	SIZE	MATERIAL / FINISH	TYPICAL APPLICATION
Pop Rivet	1/8" x 1/4" Grip	Aluminum	Various flashing attachments
Phillips pan head sheet metal screws	Diameter varies x 1/2"	Stainless Steel	Various flashing and structural attachments
Hex washer head self drilling screw	Diameter varies x Length varies	Steel / Zinc	Various structural and non structural attachments
Phillips pan head sheet metal screw w/ bonded washer	#12 x Length varies	Stainless Steel	Attach to pressure cap
Hex washer head thread cutting screw	1/4"-20 x Length varies	Steel / Zinc	Various structural and non structural attachments
Phillips flat head thread cutting screw	1/4"-20 x 3/4"	Steel / Zinc	Attach structural seal flange to framing members
6 Lobe drive truss head thread rolling screw	3/8"-16" x 1"	Steel / Zinc	Gusset plate connections
Hex head cap screw w/ lock washer, flat washers and nut	Diameter varies x Length varies	Steel / Zinc or Stainless Steel	Structural connections
Hex head lag screw	Diameter varies x Length varies	Steel / Zinc	Structural wood connections
Threaded rod w/ lock washer, flat washer and nut	Diameter varies x Length varies	Steel / Zinc or Stainless Steel	Structural masonry connections

Packaging and Delivery

Acurlite takes extreme care in packaging a project for delivery to minimize the possibility of freight damage or missed parts.

- ➤ Once the skylight is fully fabricated and assembled in the shop for accuracy the skylight is then knocked down (KD) for shipment.
- ▶ If the project allows, the skylight can ship fully or partially unitized for ease of installation.
- ▶ Skylights will be packaged and loaded in sequential order for ease of installation.
- All miscellaneous items (small parts and fasteners) and silicone will be boxed and labeled accordingly.
- ➤ All parts, BOM, and erection drawings are labeled and marked. If multiple units exist they will be color coded.



Receiving and Material Acceptance

Acurlite typically ships on dedicated carriers or company vehicles to minimize the possibility of freight damage or missed parts. When receiving a shipment the customer is expected to check and double check for damage or missing bundles as per the "bill of lading". If you find any discrepancies contact Acurlite as soon as possible.

Receiving Checklist:

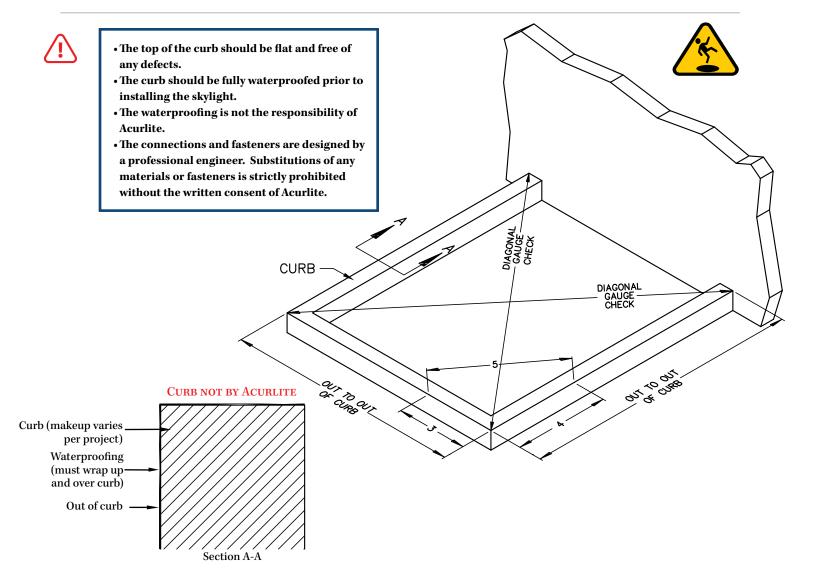
- ✓ Any visible freight damage or glass breakage (if applicable)?If so be sure to provide the factory with written and photo documentation within 24 hours
- ✓ Does the Bill Of Lading (BOL) match packaged items?
 If not be sure to provide the factory with written and photo documentation within 72 hours
- ✓ Are the erection drawing with the delivery?

 If not be sure to notify the factory ASAP
- ✓ Are all parts and critical small parts (fasteners, silicone and other miscellaneous boxed items) complete with quantities as stated?
 If not be sure to provide the factory with written and photo documentation within 72 hours

Storage

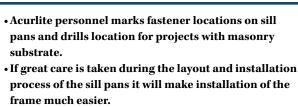
If materials are for long term storage the above receiving checklist still needs to be reviewed.

- Material stored more that 15 days must be in a cool dry place.
- ▶ Material needs to be tarped and out of direct sunlight if stored outdoors.
- ▶ Material needs to be properly secured and protected from incidental damage.
- ► Long term outdoor storage is not recommended.



- Examine curb make up. If the curb makeup is not consistent with what is indicated on the shop/ erection drawings please contact the factory immediately. Attachment of the skylight to a substrate other than what the connection was designed for is strictly prohibited without the written consent of Acurlite.
- ✓ Check the dimensions of the curb. These dimensions are typically referred to as "OUT TO OUT OF CURB".
 - ➤ Compare these dimensions to your shop/erection drawings. If these are not consistent with the dimensions indicated on the drawings please contact the factory immediately. Attachment of the skylight in a location other than what was designed is strictly prohibited without the written consent of Acurlite.
- ✓ Check the curb for square.
 - ➤ Some typical ways of doing this are the 3-4-5 Triangle Method and/or taking diagonal gauge check dimensions.
- ✓ Check the curb for level.
 - ▶ If using a level the longer the better.
 - ▶ If the elevation of the curb or certain part of the skylight is critical it would be good practice to use an auto level.

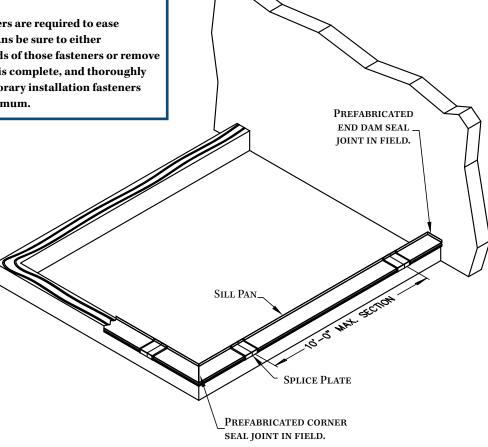


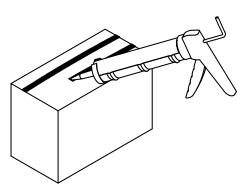


· If any temporary fasteners are required to ease installation of the sill pans be sure to either thoroughly seal the heads of those fasteners or remove them, once installation is complete, and thoroughly seal the hole. Any temporary installation fasteners should be kept to a minimum.

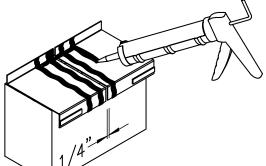




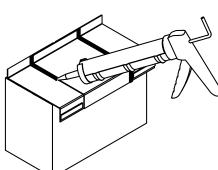




Apply sealant to top of curb and set sill pans in sealant. Using two generous beads, one towards the outside of the curb and one towards the inside.



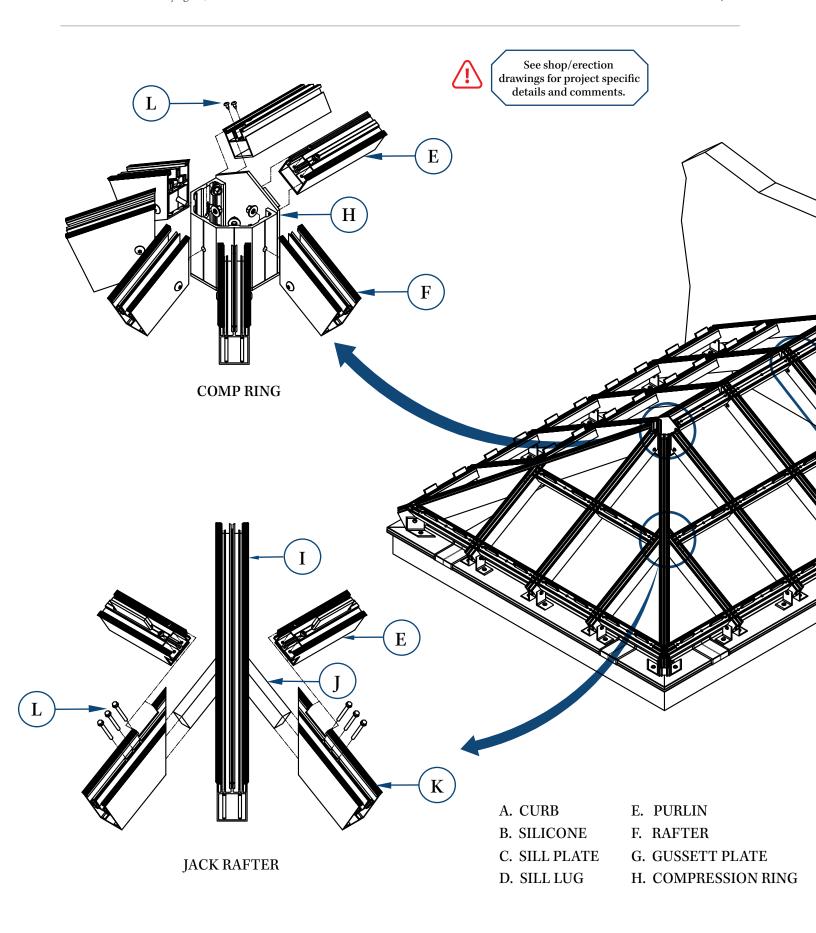
Apply a generous bead of silicone on either side of joint. Approximately 11/2" away from joint.

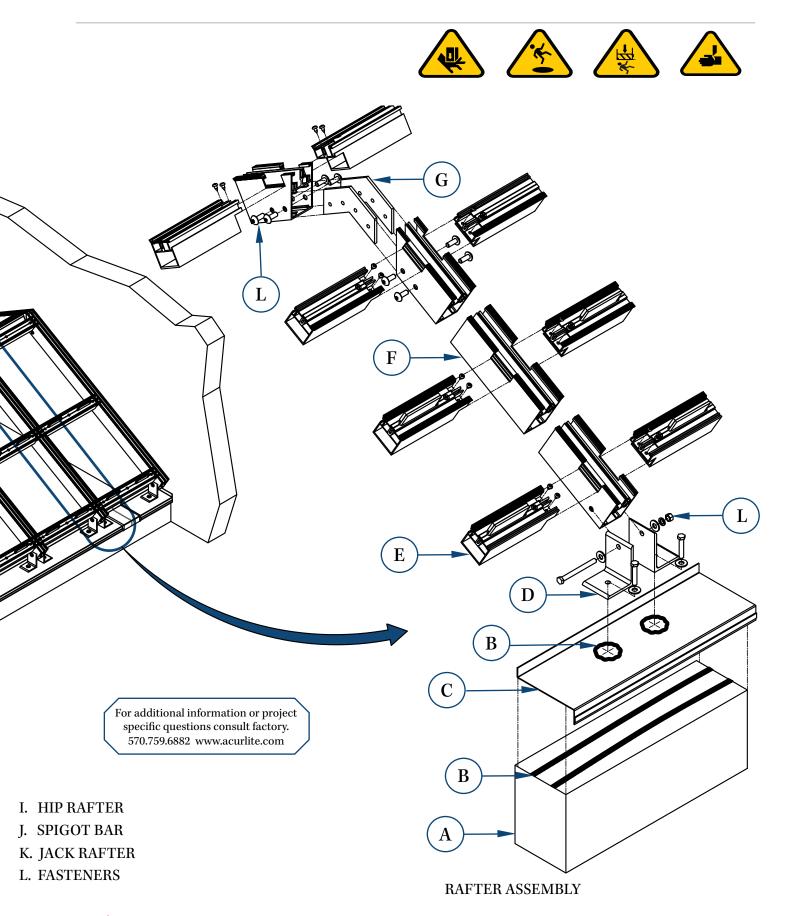


Set splice plate over joint. Apply silicone along each edge of splice plate and tool.



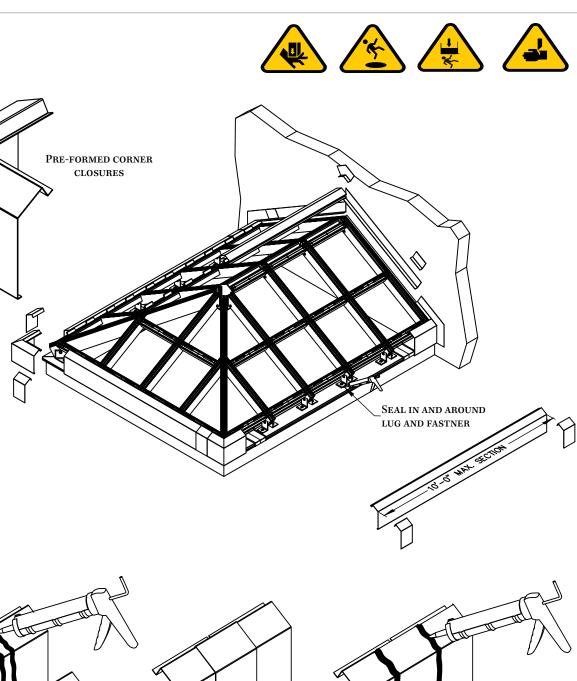
All surfaces receiving silicone should be properly cleaned and primed per sealant manufacturer's recommendations. DOWSIL[™] products or equivalent must be used. Please check with sealant manufacturer for compliance.

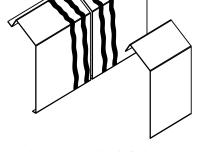




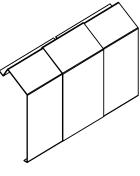


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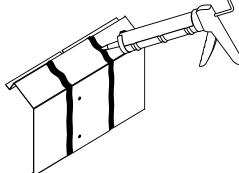




Apply a generous bead of silicone on either side of joint. Approximately 1-1/2" away from joint.



Set splice plate over joint.



Apply silicone along each edge of splice plate and tool.



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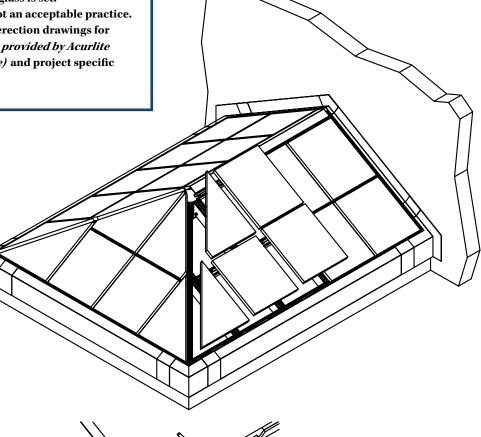


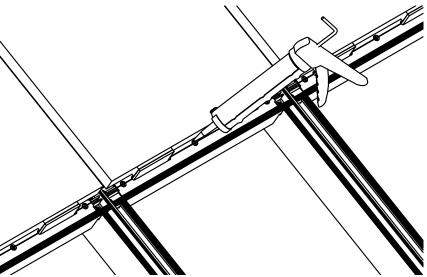






- Prior to installing glass, trim and set all gaskets.
- Make sure all surfaces receiving glazing and/or silicone are clean and dust free.
- If structural silicone seals are required silicone must be applied after glass is set.
- "Smoosh" glazing is not an acceptable practice.
- Reference your shop/erection drawings for glazing locations (not provided by Acurlite if frame only purchase) and project specific glazing details.

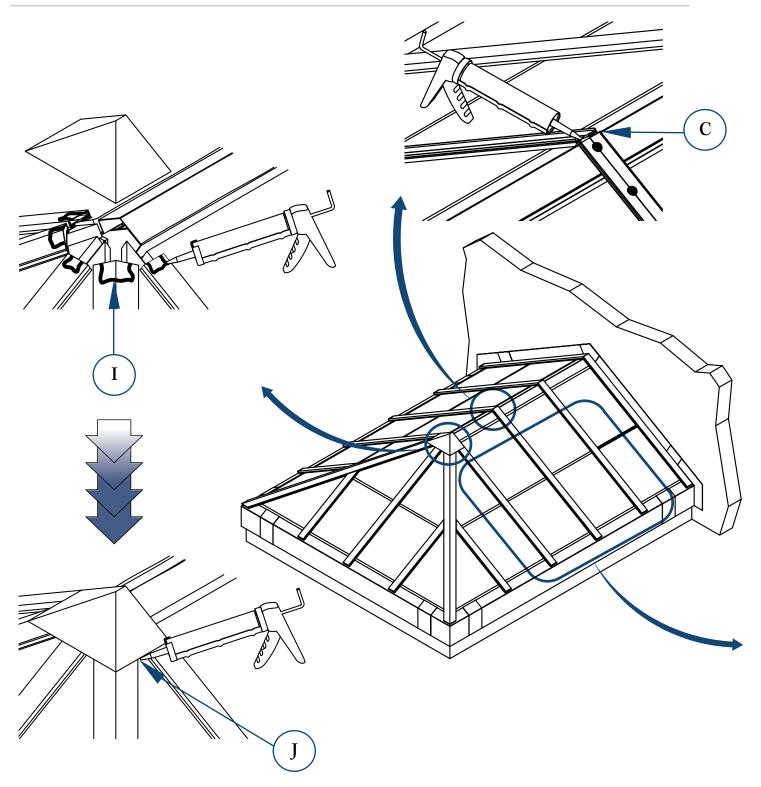




• Apply structural silicone sealant (if required) between glazing and structural seal



All surfaces receiving silicone should be properly cleaned and primed per sealant manufacturer's recommendations. DOWSIL* products or equivalent must be used. Please check with sealant manufacturer for compliance.



- A. Install pressure cap using fastener provided Refer to shop erection drawings for type
- B. Apply sealant over screw head and tool
- C. Apply sealant over joint and tool
- D. Apply sealant at end of pressure cap and seal
- E. Apply masking tape along edge of glass

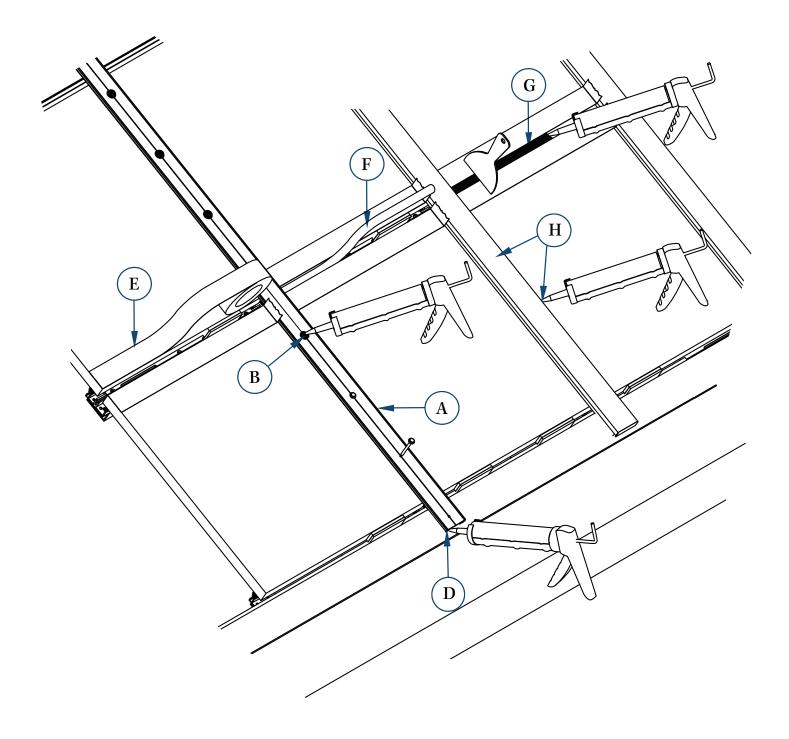
- F. Insert backer rod into void Set backer rod at proper height
- G. Fill void with sealant and tool
- H. Install cover cap and apply sealant and tool
- I. Apply sealant under peak
- J. Set peak cap, fill with sealant and tool





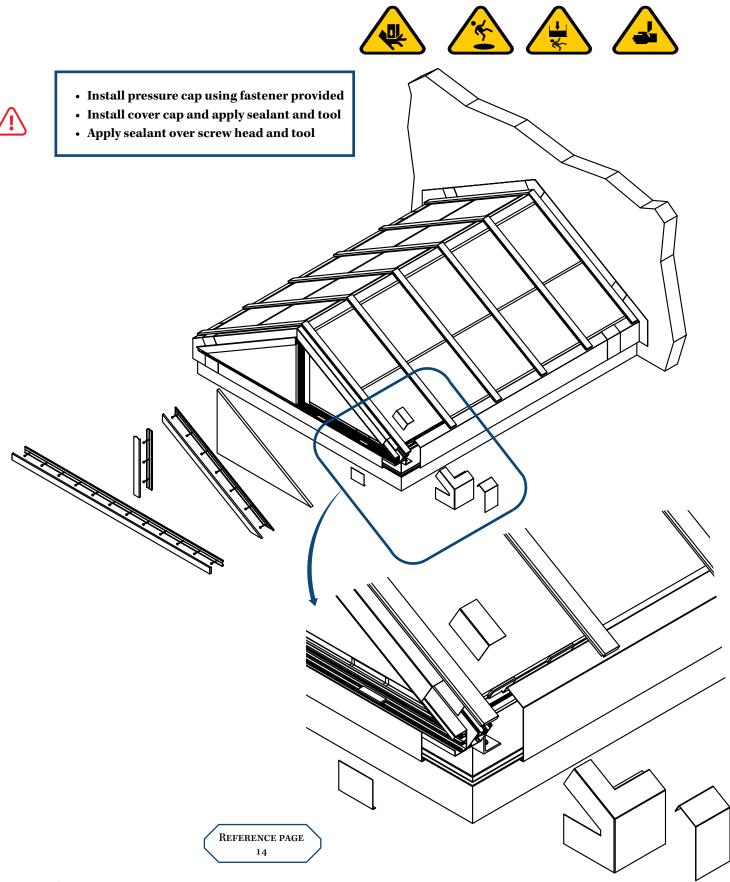








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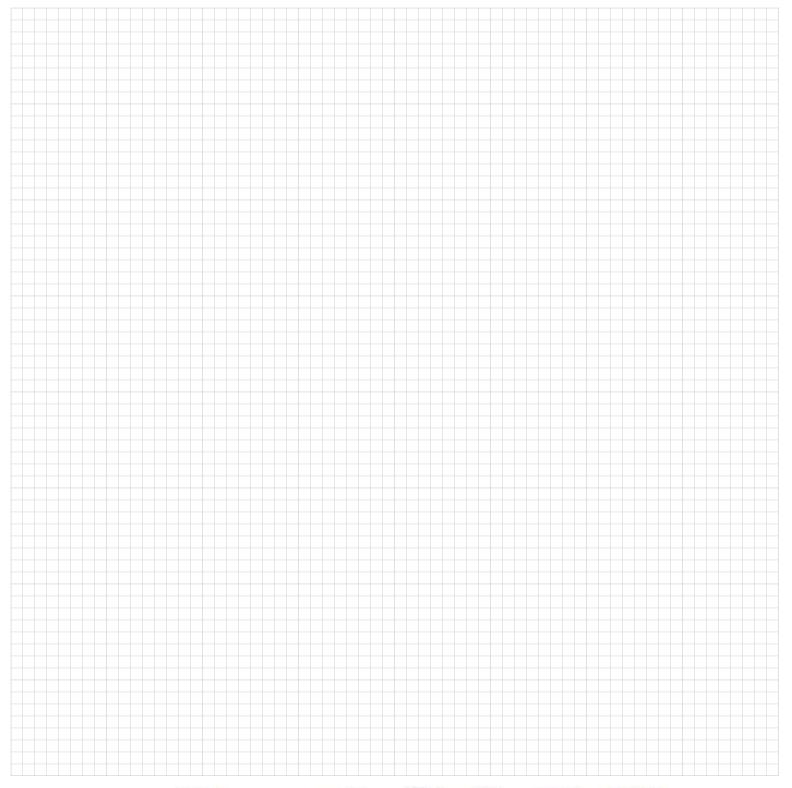
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Scale 1/8





Scale 1/8





Glossary

American Architectural Manufacturers Association. A national trade association that establishes **AAMA**

voluntary standards for the window, door and skylight industry.

Adhesive Failure Failure of the bond between the sealant and the surface to which it is in contact.

Aesthetics The science and philosophy of beauty.

Wall system layer(s) that limits the transfer of liquid water and air through the system. The barrier shall be adequate to withstand design wind load requirements, either independently or through a Air and Water Barrier

backup system. The terms "air and water barrier" and/or "air/water barrier" may also indicate a

material that is also a vapor retarder.

Air Leakage The flow of air which passes through fenestration products.

Any device used to secure a building part or component to adjoining construction or a supporting Anchor

member.

Raw glass used as a glazing product. Further processing is required to transform annealed glass **Annealed Glass**

into safety glass.

A vessel that employs high pressure and heat. In the glass industry, used to produce a bond be-Autoclave

tween glass and the interlayer, creating a laminate glass product.

A material placed into a joint, primarily to control the depth and shape of the sealant. Also serves **Backer Rod**

as a bond breaker.

The wind velocity used to calculate external pressures acting on a surface of structure. Basic Wind **Basic Wind Speed**

Speed is expressed in miles per hour (mph) or kilometers per hour (kph) and is based on wind

speed maps included in building codes or other related standards.

The dimension by which the inner or outer edge of the frame or glazing stop overlaps the edge of Bite

the glazing.

Bond Breaker A material used to prevent three-sided adhesion in sealant joints.

Sheet stock bent or "broken" to desired shape, as required by specific job, on a power or manual

Brake Shape brake machine. This shape is often used to cover conditions which cannot be covered by a stock

shape.

An insulated glass unit where a tube or a hole is factory-placed into the unit's spacer to accom-Breather (Tube) Units

modate elevation or pressure differences encountered in shipping. These tubes or holes are to be

sealed on the job-site prior to unit installation.

British Thermal Unit

(BTU)

Compatibility

The heat required to increase the temperature of 1 lb. of water 1 degree F.

The assembly or assemblies of materials and components that enclose building spaces and are **Building Envelope**

exposed to exterior space or separate conditioned interior space from unconditioned interior

space.

Caulk The application of a sealant to a joint, crack or crevice.

Centerline (C.L.) A line used to indicate the center of symmetrical objects.

Cohesive Failure Failure characterized by splitting within the sealant resulting from over extension.

When materials maintain physical and functional properties when in direct contact or close prox-

imity to each other. The ability of two or more materials to exist in close association for an indefi-

nite period with no adverse effect of one on the other.

Concentrated Load A force applied to a fixed point.

The deposition of moisture (liquid or frost) on the surface of an object caused by warm, moist air coming into Condensation contact with a colder object. **Condensation Gutter** A trough for carrying off condensed water, this may be drained to the exterior or allowed to evaporate. A rating number obtained under standard test conditions as prescribed in AAMA Resistance 1503. The CRF is essentially the ratio of the difference between an average Factor (CRF) inside surface temperature and the outside air temperature, and the difference between the inside air temperature and the outside air **Condensation Resis**temperature. The CRF allows for comparison of the relative performance of fenestration systems based on the tance Factor (CRF) point at which an objectionable amount of condensation occurs. The CRF is dimensionless and expressed as a number between 1 and 100. The higher the CRF, the higher the resistance to condensation. An area or room within a building that: (a) is heated or cooled by any equipment or appliance: (b) contains un-insulated ducts; or **Conditioned Space** (c) has a fixed opening directly into an adjacent area or room that is heated or cooled by any equipment or appliance or contains un-insulated ducts. Construction Architectural drawings, specifications, shop drawings, manufacturing details, test reports or contracts, build-Documents ing permits. **Cross Rafter** In a skylight system, a structural framing member between rafters; generally at or near horizontal. Curb A wall or frame used to raise roof windows, skylights, or sloped glazing above the surface of the roof. **Daylight Opening** Maximum unobstructed opening when viewed from a direction perpendicular to the plane of the opening. (DLO) As it pertains to skylights the dead load is the weight of all of the skylight components, including glass. Dead Load Typically expressed in pounds per square foot (PSF). Deflection Displacement due to flexure of a member under an applied load. Design Wind Load The wind load pressure a product is required, by the specifier, to withstand in its end use application. Any Glazing System/Glazing In-fill that has the fully reversible ability to change its performance properties, including U-factor, SHGC, or VT. This includes, but is not limited to, shading systems between the glazing **Dynamic Glazing** layers and chromogenic glazing. Glazing with optical properties that can be varied continuously from clear to dark with a low-voltage signal. Electrochromic Ions are reversibly injected or removed from an electrochromic material. Electrolysis Chemical decomposition of metal surface by the action of dissimilar metals and moisture. Any means provided to stop the flow of water out of the ends of a sill, panning system or subsill and into the **End Dam** the back dam or higher.

wall cavity, such as sealant, upstands, plates or gasketing. End dams shall be of a height equal to the height of

EPDM A synthetic rubber; Ethylene Propylene Diene Monomer.

Extruded Formed by forcing plastic material or metal through a shaped opening.

Openings in or on the building envelope, such as windows, doors, secondary storm products (SSPs), curtain Fenestration walls, storefronts, roof windows, tubular daylighting devices (TDDs), sloped glazing and skylights, designed to

permit the passage of air, light or people.

Flush Glazing A method of setting glass whereby glazing beads are installed to be flush with the plane of the glazing.

Glass that has been heat treated to a high surface and/or edge compression to glass meet the requirements of ASTM C1048 (kind FT) or CAN/CGSB 12.1. Fully tempered glass, if broken, will fracture into many small **Fully Tempered Glass** pieces (dice) which are more or less cubical. Fully tempered glass is approximately four times stronger than annealed glass of the same thickness when exposed to uniform static pressure loads.

Glaze To install glass lights or infill material.

Glazing (N) An infill material such as glass or insulted panel. (V) The process of installing an infill material in a pre-

pared opening.

Heat Strengthened

Glass

Glass that has been heat treated to a high surface and/or edge compression range to meet the requirements of ASTM C1048 (kind HS). Heat-strengthened glass is approximately two times as strong as annealed glass of the same thickness when exposed to uniform static pressure loads. Heat-strengthened glass is not considered safety glass and will not completely fracture into many small pieces (dice) as with fully tempered glass.

Installer For the purpose of this practice the installer, of fenestration products is a person or persons who do the

installation labor and those who supervise such labor.

Insulated Glass Unit

(IGU)

Two or more lites of glass spaced apart and hermetically sealed to form a single-glazed unit with an air -or gas - filled space between.

Interlayer A layer of material acting as an adhesive between layers of glazing.

Knocked Down (KD)

A product that is shipped in a disassembled condition and later assembled according to the instructions of the

 $manufacturer\ utilizing\ all\ of\ the\ components\ supplied\ or\ specified\ by\ the\ manufacturer.$

Laminated Glass Two or more lites of glass permanently bonded together with one or more polymer interlayers.

Level Having a horizontally flat, even surface with no irregularities and no vertical tilt. No part of the surface is

higher or lower than any other part.

Live Loads Loads form people and non-permanent parts of a building; loads from window washing and glazing rigs are

live loads.

Low Emissivity (Low

E) Glass

Glass with a transparent metallic or metallic oxide coating applied onto or into a glass surface, which reflects long-wave infrared energy and thus improves the U-value.

Manufacturer

A company which fabricates and/or assembles one or more parts, components, and/or accessories or supplies

entire fenestration systems.

Negative Pressure Pressure acting in the outward direction.

Neoprene A synthetic rubber having physical properties closely resembling those of natural rubber. It is made by

 $polymerizing\ chloroprenes, and\ the\ latter\ is\ produced\ from\ acetylene\ and\ hydrogen\ chloride.$

NFRC National Fenestration Rating Council. A non-profit organization that establishes objective window, door, and

skylight energy performance ratings to help compare products and make informed purchase decisions.

Overall Dimensions

(O/A)

The external dimensions of a product, expressed in millimeters or inches.

Pan Flashing (Sill

Pans)

A type of flashing used at the base of a glazing system to divert water to the exterior. Pan flashings have an upturned rear interior edge, some are contiguous while other may require end dams. Pan flashings are intended to collect and drain water toward the exterior, including water that may enter through the glazing system.

Photovoltaic A device that produces electricity directly from sunlight (photons).

Plumb To make vertical.

Positive Pressure Pressure acting in the inward direction.

Primer A product specifically designed to enhance the adhesion of sealant systems to certain surfaces.

Purlin See Cross Rafter

R-Value A measure of the resistance of an insulating or building material to heat flow. The higher the number, the

greater the resistance to heat flow. R-Value is the reciprocal of U-Value.

Rafter For sloped glazing, a main, nominally vertical, framing member. Safety Data Sheet Data for evaluating hazards, toxicity and proper handling of chemicals, chemical compounds and chemical (SDS)

mixtures.

A strengthened or reinforced glass that is less subject to breakage or splintering. See also Fully Tempered Safety Glass

Glass and Laminated Glass.

The use of safety glass in hazardous locations. Building codes require safety glazing in hazardous conditions Safety Glazing such as skylights or sloped glazing. Laminated glass is required to reduce the possibility of any part of the

glazing from vacating the glazed opening when broken.

Sealant A compound used to fill and seal a joint or opening.

Generally rectangular, cured extrusions of neoprene, EPDM, silicone, rubber or other suitable material on Setting Block

which the glass product bottom edge is placed to effectively support the weight of the glass.

Shim A thin flat piece of suitable material used to level or plumb a glazing system during installation.

Silicone Sealant A sealant having as its chemical composition a backbone consisting of alternating silicon-oxygen atoms.

A glazing and framing assembly consisting of sloped and sometimes vertical surfaces; the assembly is general-Skylight

ly inserted into the roof of a building to admit daylight.

A glass and framing assembly that is sloped more than 15° from vertical and which forms essentially the entire **Sloped Glazing**

roof of the structure.

Snow Load Loads imposed on a building wall, roof or skylight by the accumulation of snow; generally a long term load.

A written document often accompanying architectural drawings, giving such details as scope of work, ma-Specification terials to be used, installation method, required performance and quality of workmanship for work under

contract.

Square Two construction members that meet at a right (90°) angle.

Structural Silicone

Glazing

A system in which the glass product is bonded to the framing members of a glazing system utilizing a structur-

al silicone adhesive/sealant without the presence of outdoor retainers or stops.

Substrate A base material to which other materials are applied and/or attached.

An element made of material with relatively low thermal conductivity, which is inserted between two mem-Thermal Break

bers having high thermal conductivity, in order to reduce the heat transfer.

Thermal movement is the expansion and contraction of the glazing system elements due to the rise and fall of Thermal Movement

their temperature.

The operation of pressing in and striking a sealant in a joint, to press the sealant against the side of a joint and Tooling

secure good adhesion; the finishing off of the surface of a sealant in a joint so that it is flush with the surface.

A product comprised of a base and curing agent or accelerator, necessarily packaged in two separate contain-Two-Part Sealant

ers which are uniformly mixed just prior to use.

Unit Skylight A complete factory assembled and glazed skylight.

The overall coefficient of heat transfer; a measure of the heat transfer through material or construction due to U-Value

the difference in air temperature on the two sides.

Weephole (Weep) An opening that allows water to drain.

Wet Seal A method of sealing utilizing gunnable sealant as the primary seal.

Wind Load Load on a structure and it components due to the effects of the wind.

Maintenance & Cleaning

General Inspection of Skylight

An annual inspection of the skylight system should include the following:

- ✓ Visual inspection of all silicone joints for cracks or damage
- ✓ Visual inspection of flashings for damage
- √ Visual inspections for broken joints or slipped connections especially in areas subject to excessive building movement
- ✓ Check system for any loose screws or fasteners
- ✓ Check for any accumulated debris on exterior of skylight and remove if possible
- ✓ If skylight system includes an exterior gutter system check for and clear any accumulated debris
- √ Visual inspection of all glazing materials
- ✓ Visual inspection of all surrounding conditions

Skylight System Cleaning

Aluminum – whether cleaning a painted or anodized finish a mild detergent and warm water may be
applied safely to any aluminum finish. Use of a soft cloth, sponge, chamois or soft bristled brush can be
used to apply the cleaning solution. The surfaces should then be rinsed thoroughly with clean water to
remove all cleaning solution, dirt and debris. Avoid the use of cleaners such as steel wool, abrasive acids
and chemical solutions.

Glass Cleaning

- When dirt and residue are visible on the glass surface it is recommended to clean the glass.
- Mild detergent, with large amounts of water can be used to clean glass. Always use as much water as possible when cleaning. Bristle mops used in window cleaning can be used safely on skylight glass. A soft cloth, sponge or chamois can also be used. Avoid the use of abrasives of any kind.
- Rinse the entire glass surface with plenty of clean water starting from the top of the skylight unit working downward. The excessive dirt and debris must be rinsed from the glass before applying the cleaning solution.
- When glass is completely rinsed of dirt and debris the cleaning solution can be applied to the surface.
 A squeegee, soft bristle mop or a soft sponge can be used to wash the glass surface. Make sure plenty of clean water is applied to the glass surface to rinse the cleaning solution from all surfaces. Do not allow the cleaning solutions to remain on the glass surface for an extended period of time before rinsing it off with plenty of clean water.





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