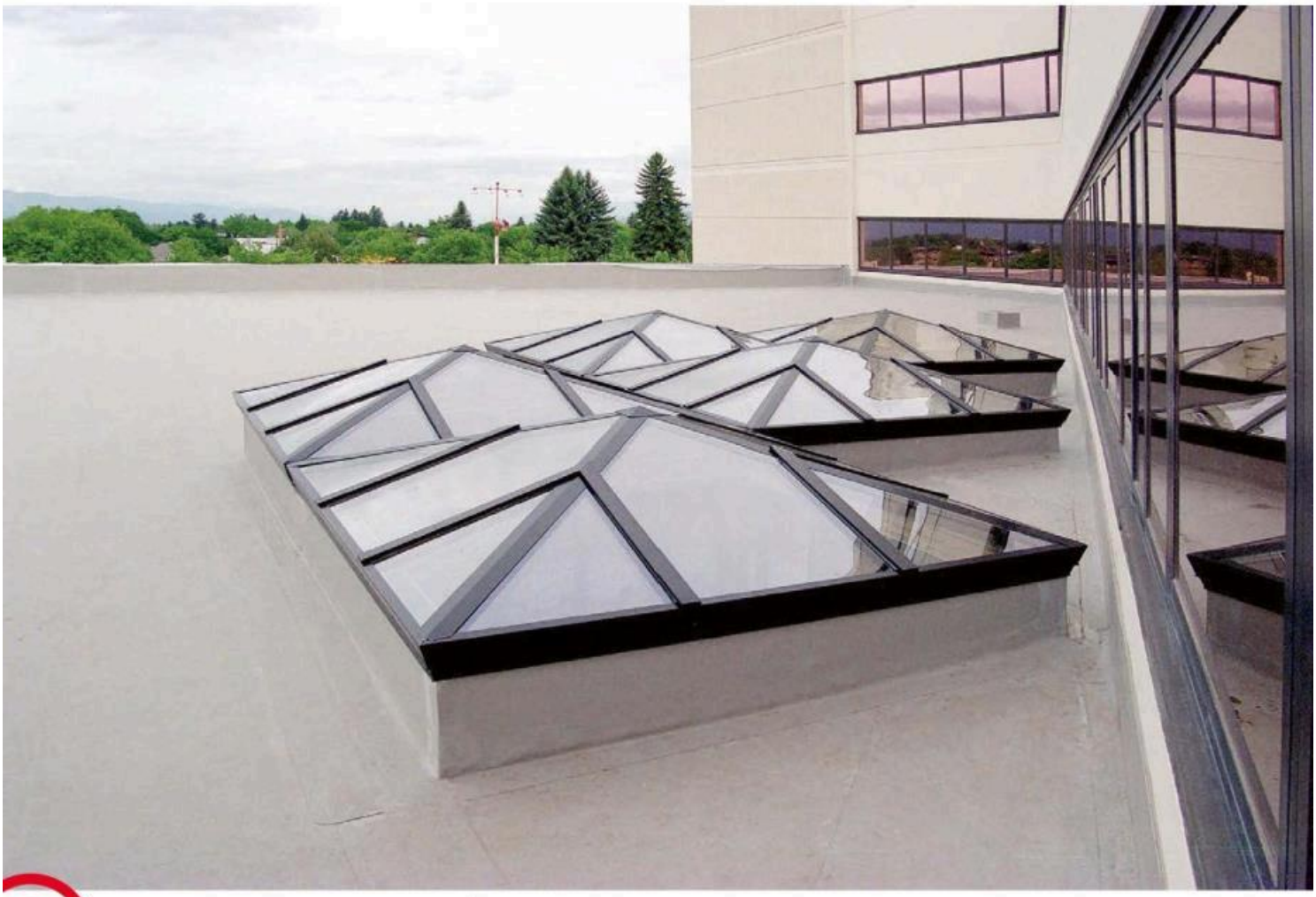
DETAILS

INSTALLING SKYLIGHTS

A Roofer's Guide to Installation Best Practices

BY GLENN FERRIS



ROOF PENETRATIONS. These are words most roofing contractors never want to hear when taking on a job. The general reason behind it – leaks – can easily become a nightmare. As a result, it's not surprising less-experienced contractors might dread working with one of the scapegoats often unfairly blamed for such matters: skylights. That said, leaks can be avoided with good water management and best installation practices. This is great news, because the desire for skylights in the commercial, institutional and industrial markets is growing year over year.

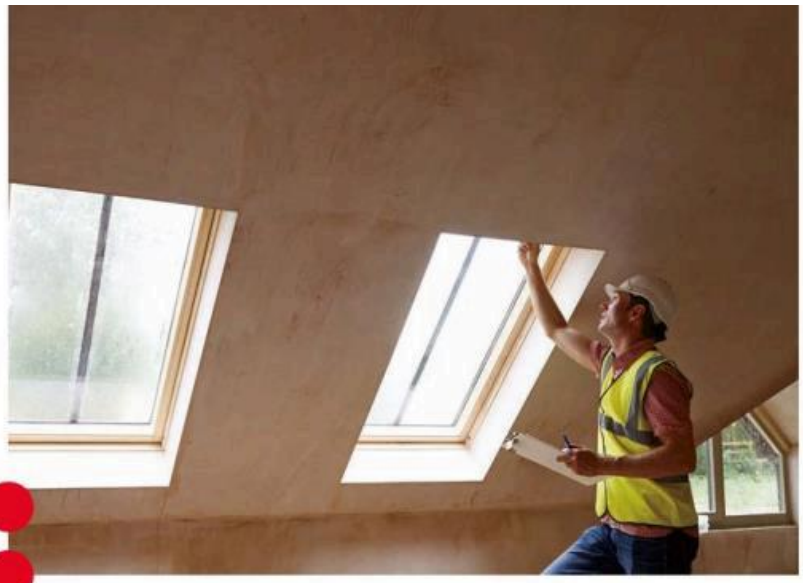
Consider that the global skylight market is witnessing rapid growth driven by rising demand for daylighting solutions, increased emphasis on environmental sustainability, and reduced energy consumption, in both commercial and residential buildings. That's the functional reality, but skylights also serve to create striking architectural elements. Their design and placement can significantly impact the aesthetics of a building.

According to AAMA SKY-3-20, *Skylight Selection and Daylighting Design Guide including Unit Skylights, Tubular Daylight Devices (TDD) and Sloped Glazing,* a Fenestration and Glazing Industry Alliance (FGIA) document, when skylights are used for architectural emphasis, there is a greater premium placed on the interaction of daylight with the other architectural elements of the building. Skylights

PHOTO: CRYSTALITE

are positioned and sized to enhance the architectural experience of surface and volume. There is a corresponding decrease in emphasis on uniformity or distribution of illuminance. As a result, top lighting with skylights for architectural emphasis is usually found in areas without critical task illuminance requirements, such as circulation areas, entries and lobbies.

Using premiere retailers as an example: Many employ high-ceilinged spaces that use large pyramid-style skylights to define the shape and scale of the space, as well as to provide a bright, airy-feeling open conducive for browsing.



Testing should be performed as soon as possible after the skylight is installed, and prior to the installation of drywall or other interior finish materials.

INSTALLATION TIPS

On the subject of good water management and installation practices for common, non-residential applications, following are a few suggestions from FGIA's AAMA 1607-14 document, *Voluntary Installation Guidelines for Unit Skylights*. In this article, we'll just address two common commercial/institutional roof types: a flat, single-ply roof as well as a higher-sloped, standing-seam roof. It's worth one's time to check out 1607, as it includes excellent visual installation details that should be consulted for a smoother project.

To begin, it is highly recommended that testing be performed in accordance with AAMA 501.2 and AAMA 503 whenever skylights are installed above critical areas. Testing should be performed as soon as possible after the skylight

is installed, and prior to the installation of drywall or other interior finish materials. This can significantly add to the observer's ability to pinpoint the source if water intrusion occurs. This also applies to those instances when water-resistance testing is specified.

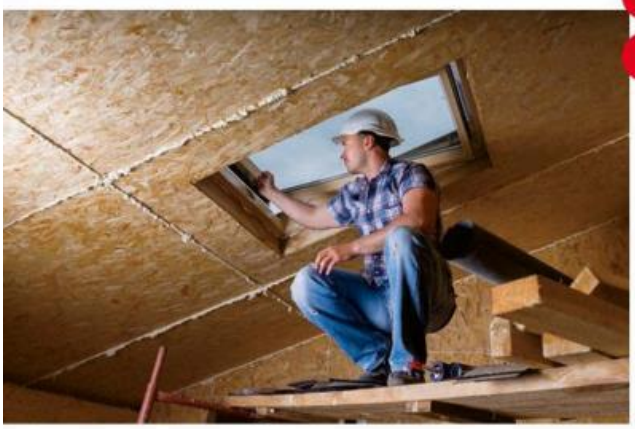
Once the cause is determined it is usually clear what the remedy is. Good skylight design follows the principles of watertight design in combination with provisions for condensation and controlled water collection and removal through the skylight frame to the exterior. Too often, the improper use of sealants to dam up water pathways that need to be maintained only aggravates the problem. Poor remedial work can destroy the skylight's ability to function as it was designed. In a similar manner, good installation practices can also be rendered dysfunctional in the same way. A great product is only as good as its installation. Thoughtful troubleshooting can resolve issues simply, cost effectively and permanently.

LOW-SLOPE ROOFS

Now, let's get back to roofs. According to section 6.18 of 1607, for deck-mounted skylights on low-slope/flat single-ply roofs, the roof system itself is typically not in place around the skylight area and not installed until the skylight has been installed. Be aware that after the rough opening has been prepared, per the manufacturer's dimensions, temporary support of the rafter may be necessary if a rafter is cut. It may also be necessary to reinforce adjacent remaining rafters for structural purposes. The skylight should be fastened to the roof deck per local structural and manufacturer requirements.

Roofing material should be run onto the skylight frame, trimming the material as required. This positive seal to the skylight frame is most critical to create a proper watertight installation. That said, the sealants or adhesives used must follow the manufacturer's instructions.

As far as the flashing membrane (if applicable per roofing manufacturer's instructions), a separate membrane used as a means of counter-flashing can be applied similarly as the prior step. This material laps over the membrane that has already been run up the side of the skylight curb. Care must be taken during the installation of the roofing material so as not to block any weep holes that may be in the skylight system. Consult the skylight manufacturer if there is a question as to the location of these holes. Such instructions matter, as these systems often carry long-term warranties, thus requiring strict maintenance and regularly



Be aware that after the rough opening has been prepared, per the manufacturer's dimensions, temporary support of the rafter may be necessary if a rafter is cut.

scheduled inspections – something of which the owner should be made aware.

STEEP-SLOPE ROOFS

For the sometimes more challenging high-sloped roofs, consider 1607 (section 6.10) guidelines for curb-mounted skylights. In such cases, for standing-seam (narrow profile) roofs, the skylight's wood curb fastens to roof deck. Metal panels should be placed up to approximately 1 inch from the lower edge of the curb. The approach here is to utilize a simple top and bottom flashing collar, and then to modify the roof panels that run along the sides of the skylight's curb to function as side flashing. Since the side flashing panels have a flat profile with a foldable edge seam, sealants are utilized as secondary water barriers and are sealing between relatively flat surfaces.

Some specific tips: Roll and flatten, as necessary, those standing seams to be covered by sill flashing flange. Apply two generous beads of sealant between sill flashing flange and roof panel for the extra windblown rain protection.

Install the roof panels over and around the head flashing (saddle), cutting as necessary. Sealant should also be applied between the head flashing (saddle) and the overlapping roof panels. Finally, the skylight frame should be on top of wood curb and fastened down.

SAFETY PROCEDURES

Of course, fall protection – specifically on steep-sloped roofs – must be shared amongst the many parties involved with the design, construction and maintenance of roofs. 1607 recommends safety procedures for minimizing risk should be implemented – and followed – as a strong foundation for mitigating the occurrence of all falls from roofs and roof openings. The FGIA Skylight/Sloped Glazing Council has worked diligently for over 30 years to establish technically solid performance standards and design guidelines in which safety has always been an important consideration. For example, when glazing is not proven to be sufficiently resistant to falls, the use of railings, security grids or safety screens (not to be confused with insect or glass retention screens) are recommended. More information can be referenced from the National Institute of Safety and Health (NIOSH).

As noted earlier, AAMA SKY-3-20, available from FGIA, is another technical document well worth getting to know, as it is a rich source of information relating to daylighting and the use of skylights. It may be purchased from the FGIA Online Store at FGIAonline.org/Store. R

ABOUT THE AUTHOR: *Glenn Ferris began his career with the Fenestration and Glazing Industry Alliance (FGIA) in 2018. He has extensive experience in the fenestration industry dating back to 1992. He is a liaison for many councils, committees and study/work/task groups guiding them in the completion of the scope of each group. He can be reached at gferris@fgiaonline.org.*