

Table 3-3 – Skylight Requirements

			Climate Zones				
			1,16	3-5	6-9	2,10-13	14, 15
Nonresidential	U-factor	Glass w/Curb	1.11	1.11	1.11	1.11	1.11
		Glass w/o Curb	0.68	0.82	0.82	0.68	0.68
		Plastic	1.04	1.11	1.11	1.11	1.11
	SHGC Glass	0-2% SRR	N/R	0.57	0.57	0.46	0.46
		2.1-5% SRR	0.N/R	0.40	0.40	0.36	0.36
	SHGC Plastic	0-2% SRR	0.69	0.69	0.69	0.69	0.69
		2.1-5% SRR	0.57	0.57	0.57	0.57	0.57
	Residential High-rise	U-factor	Glass w/Curb	1.11	1.11	1.11	1.11
Glass w/o Curb			0.68	0.82	0.82	0.68	0.68
Plastic			1.11	1.11	1.11	1.11	1.11
SHGC Glass		0-2% SRR	0.46	0.57	0.57	0.46	0.46
		2.1-5% SRR	0.36	0.32	0.40	0.32	0.31
SHGC Plastic		0-2% SRR	0.69,0.57	0.57	0.57	0.57	0.57
		2.1-5% SRR	0.55	0.39	0.57	0.34	0.27

Excerpt from Standards Tables 143-A and 143-B, Skylight Roof Ratio, SRR.

Skylight Area

§143(a)6A.

The area limit for skylights is 5 percent of the gross exterior roof area or skylight roof ratio (SRR). This effectively prevents large skylights under the envelope component approach. The limit increases to 10 percent for buildings with an atrium over 55 ft high (see Reference Joint Appendix JAI definition). The 55ft height is also the height limitation at which the California Building Code requires a mechanical smoke-control system for such atriums (CBC Sec. 909). This means that the 10 percent skylight allowance is not allowed for atriums unless they also meet this smoke control requirement. All skylights must meet the maximum U-factor criteria.

There are two ways that skylights can be mounted into a roof system, either flush-mounted or curb-mounted. In order to create a positive water flow around them, skylights are often mounted on "curbs" set above the roof plane. These curbs, rising 6 to 12 inches (15 to 30 centimeters) above the roof, create additional heat loss surfaces, right where the warmest air of the building tends to collect.

Skylight area of unit skylights is the area of the rough opening of a skylight. The rough framed opening is used in the NFRC U-factor ratings (NFRC U-factor ratings for manufactured skylights with integrated curbs include glazing, framing, and the curb) procedure; it is also the basis of the default U-factors in Reference Nonresidential Appendix NA6. For skylights, the U-factor represents the heat loss per unit of rough framed opening (the denominator). However, the heat loss (the numerator) includes losses through the glazing, the frame, and the part of the curb that is integral with the skylight and included in the skylight test. Portions of roof that serve as curbs that mount the skylight above the level of the roof (see Figure 3-3) are part of the opaque building envelope.

Site-built or manufactured monumental or architectural skylights that are equipped with integral built-in or site-built curbs (not part of the roof construction) are often used for atrium roofs, malls, and other applications that need large skylights and are treated

differently. In such cases the skylight area is the surface area of the glazing and frame/curb (not the area of the rough framed opening), regardless of the geometry of the skylight (i.e., could be flat pyramid, bubble, barrel vault, or other three-dimensional shape). For special cases such as clerestory, rooftop monitor or tubular skylights, see Chapter 5 Section 5.2.1 of this manual.

U-factor = Heat Loss / Area

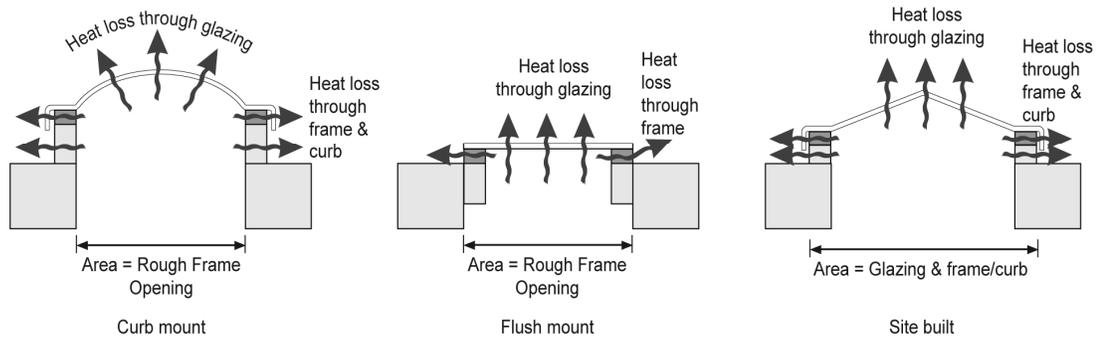


Figure 3-3 – Skylight Area

When skylights are specified, the designer must also calculate the skylit daylight area. If the total of the skylit daylight areas in a room exceed 2,500 ft², the skylit daylight area must be drawn on the plans. See Figure 3-5 below for an example of the skylit daylight area. See Section 5.2 of this manual for a detailed discussion of the daylight areas.

Skylight U-factor

§143(a)6B

For skylights, the U-factor and solar heat gain coefficient (SHGC) criteria is different, depending on whether the skylight glazing material is plastic or glass. For glass skylights, the U-factor criteria depend on whether or not the skylight is intended to be mounted on a curb. It is assumed that all plastic skylights are mounted on a curb. See Standards Tables 143-A, 143-B, and 143-C for U-factor requirements. As discussed above, the U-factor for skylights includes heat losses through the glazing, the frame and the integral curb (when one exists). In many cases, an NFRC rating does not exist for projecting plastic skylights. In this case, the designer can make use of the default fenestration U-factors in Standards Table 116-A.

If a glass skylight is installed and it is not possible to determine whether the skylight was rated with a curb, compliance shall be determined by assuming that the skylight must meet the requirements for skylights with a curb. All plastic skylight types are assumed to meet the requirements for plastic skylights with a curb.