

GG265-14

808.3.1.1

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Revise as follows:

808.3.1.1 Sidelighting. The daylit area shall be illuminated by fenestration that complies with Table 808.3.1.1 and Figure 808.3.1.1(4). Where fenestration is located in a wall, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the top of fenestration facing within 45 degrees (0.785 rad) of east or west or up to 1.5 times the height from the floor to the top of all other fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 2 feet (610 mm), whichever is less, as indicated in Figure 808.3.1.1(1). Where fenestration is located in a rooftop monitor, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures 808.3.1.1(2) and 808.3.1.1(3). Vertical fenestration shall be provided with an automatically controlled method for managing glare. Such methods include automatically controlled shading devices or dynamic glazing capable of modulating in multiple steps the amount of light transmitted into the space in response to daylight levels. Control systems shall contain a manual override that shall reset to automatic control after not more than 4 hours.

$$EA = (AF \times VT) / DA$$

(Equation 8-2)

where:

EA = Effective aperture.

AF = Area of fenestration.

VT = Visible transmittance of the fenestration.

DA = Daylit area.

Reason: The purpose of this proposal is to add consideration of glare control to the prescriptive daylighting requirements of the IgCC. One goal of the IEQ section is to deliver an environment in which occupants are comfortable. Visual comfort is an important area to consider, as occupants' remedies for dealing with visual discomfort can undermine both the energy and the daylighting benefits of a good daylighting design. As such, good daylighting design will always include a dynamic response for glare. The 2012 IgCC requires daylighting for many spaces, as specified in sections 808.2 and 808.3. Within these requirements, the performance option (section 808.3.2) ensures that both daylighting and glare control are considered by setting both minimum *and* maximum illumination levels that must be met. However, under the prescriptive daylight option, there is no consideration of glare control, even though higher levels of daylight can exacerbate glare discomfort if not properly accounted for in the building design. In the presence of glare, if manual blinds are present, occupants will pull them or place objects (cardboard, paper etc.) permanently on the opening to control the glare. Once blinds are manually shut to counter a temporary glare condition, they usually remain shut the rest of the day, thus negating much of the daylighting benefit even after the sun has moved and there is no more direct glare. [references 1, 2] Therefore, to ensure the intended daylighting benefits are achieved and maintained, this proposal would add language under the prescriptive option to require vertical fenestration to include automatically controlled blinds or dynamic glazing that would respond to glare conditions. Additionally, the system shall include a manual override to allow for individual control, but is required to be reset after a certain amount of time. Alternately, the performance daylight option may be used to allow any method to achieve the same goal as long as the minimum and maximum illumination levels are met.

Bibliography:

1. D Bourgeois, C Reinhart, I Macdonald, "Adding advanced behavior models in whole building energy simulation: A study on the total energy impact of manual and automated lighting control", Energy and Buildings vol 38, #7, July 2006
2. C.F. Reinhart, "Lightswitch 2002: a model for manual control of electric lighting and blinds", Solar Energy 77(1) 2004, 15-28.

Cost Impact: Will increase the cost of construction. This proposal will increase the cost of construction when using the prescriptive daylighting path compared to the 2012 IgCC as it now requires glare control to be addressed. The performance path for daylighting already required glare control to be included (through maximum illumination), so cost is not necessarily increased in that path - it depends on the specific method (internal or external shading, dynamic glazing, etc).

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