

# MANDATORY MEASURES

## DAYLIGHTING

Reference: Sub-Chapter 4, Section 130.1(d)

### Daylighting Controls

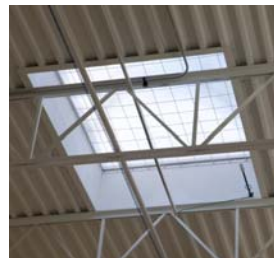
- General lighting in the areas under skylights and directly adjacent to windows must have daylighting controls.
- Lighting in daylit zones should have multi-level steps, per Table 130.1-A
- Light levels provided at night should be available at all other times
- When sufficient daylight is available (>150% of full output light levels), controls must reduce lighting power by at least 65%



Photo: Leviton



Photo: Sensor Switch / Acuity Brands



### DAYLIGHT ZONES

Areas within a building that are close enough to a source of daylight that daylight harvesting is possible are considered within a "daylight zone."

**Skylit Zone:** An area illuminated by one or more skylights

**Primary Sidelit Zone:** A daylit area directly adjacent to one or more windows

**Secondary Sidelit Zone:** An area not directly adjacent to a window that still receives some daylight through its proximity to the window

*Daylight zones must be marked on building floor plans.*

---

Section 130.1 (d)1      3/22/2017      SLIDE 81      SECTION 4      DAYLIGHTING CONTROLS

### CALCULATING A SKYLIT ZONE

**Calculation Steps:**

1. Define the approximate shape of the opening of the skylight
2. Determine the ceiling height (CH)
3. Multiply the CH by 0.7
4. Add this value in all directions around the skylight (starting at the edge of the rough opening)
5. Subtract any area in which has a permanent obstruction taller than half the distance from the floor to the bottom of the skylight

**Width and length =**  
 Opening of skylight + (0.7 X ceiling height from opening)

---

3/22/2017      SLIDE 82      SECTION 4      DAYLIGHTING CONTROLS

### CALCULATING A SKYLIT ZONE

$0.7 \times CH$

Add in all Directions

3/22/2017 SLIDE 83 SECTION 4 DAYLIGHTING CONTROLS

### CALCULATING PRIMARY SIDELIT ZONES

PRIMARY SIDELIT ZONE

Controlled fixtures in the primary sidelit zone

Depth = Window head height (1HH)

Width = Window width plus 0.5 window height

Width

Depth

$0.5 \times HH$

#### Calculation Steps

1. Determine the window head height for each window
2. The **depth** of the zone is one window head height (HH) into the area adjacent to the window
3. The **width** of the zone is the width of the window plus half the window head height on each side of the window
4. Subtract any area on a plan that is blocked by a permanent obstruction that is six feet or taller.

3/22/2017 SLIDE 84 SECTION 4 DAYLIGHTING CONTROLS

### CALCULATING THE SECONDARY SIDELIT ZONES

**Calculation Steps**

1. Add one additional window head height to the same dimensions determined for primary sidelit zones
2. Subtract any area that is blocked by a permanent obstruction that is six feet or taller

3/22/2017    SLIDE 85    SECTION 4    DAYLIGHTING CONTROLS

### PRESCRIPTIVE COMPLIANCE REQUIREMENT FOR SECONDARY SIDELIT ZONES

When using the prescriptive compliance method, the automatic daylighting controls requirements for primary sidelit zones also apply to general lighting luminaires that are at least 50% in a secondary sidelit zone.

Section 140.6 (d)    3/22/2017    SLIDE 86    SECTION 4    DAYLIGHTING CONTROLS

**ACTIVITY: CALCULATING DAYLIT ZONES**

Using the convenience store floor plan in your workbook, calculate and draw:

1. Primary sidelit zones
2. Secondary sidelit zones

**Assume the following:**

- Window head height: 10 ft.
- Aisle height: 4 ft.



### ROOFTOP MONITORS

The standards define skylights as glazing having a **slope less than 60 degrees from horizontal**. Because rooftop monitors have a slope greater than 60 degrees, they are therefore considered windows. Below is the daylit zone for a rooftop monitor with a window 4 feet high projecting over a 10 feet tall roof.

3/22/2017    SLIDE 89    SECTION 4    DAYLIGHTING CONTROLS

### NEW CONSTRUCTION OF LARGE SPACES

Large enclosed spaces, such as large open offices, are required to have a minimum amount of daylight available when using the prescriptive method of compliance. The minimum requirements apply to both conditioned and unconditioned spaces that are:

1. In Climate Zones 2–15
2. Have a floor area greater than 5,000 ft<sup>2</sup>
3. Have a ceiling height greater than 15 ft
4. Have a general lighting system with a power density greater than 0.5 W/ft<sup>2</sup>

**Buildings that meet the above criteria must have:**

- At least 75% of the floor space of the building in a primary sidelit zone or a skylit zone
- No more than 5% of the roof area may contain skylights

**Section 140.3 (c)**    3/22/2017    SLIDE 90    SECTION 4    DAYLIGHTING CONTROLS