

Issue: #TB149.3
Date: April 18, 2006
Topic: Energy Code Compliance

Update: California Title 24-2005

This bulletin summarizes the major provisions of California's Title 24 Standard for lighting controls that apply to nonresidential buildings. It is for informational purposes only and is not intended to replace the standard. Please refer to the standard for exact interpretation.

Sections 130-149 of Title 24 apply to all non-residential sites, whether conditioned or non-conditioned. With the exception of living quarters and guest rooms, these sections also apply to high rise residential and motel and hotels.

Section 150 of the code lists requirements for low rise residential and living quarters of high rise residential and motel and hotel guest rooms.

Area Controls [Title 24, Section 131(a)]

Required for: Each area enclosed by ceiling-height partitions

Requirements:

- Independent switching or control device (i.e., manual switch or occupancy sensor) must be:
 - readily accessible
 - located so occupants can see the lights, or have a pilot light
 - able to override other devices or systems (i.e., automatic shutoff) temporarily

NOTE: Line voltage switches in individual spaces that are group controlled by a relay or timeclock DO NOT comply with this requirement, since the line voltage switch is not capable of overriding the timeclock.

Exceptions:

- Lighting for security or egress in designated areas
- Public areas where switches should only be accessible by authorized personnel

Light Level Reduction Controls [Title 24, Section 131(b)]

Required for: Spaces greater than 100 ft² with a lighting load greater than 0.8 watts/ft² and more than one luminaire.

Requirements:

- Controls must be included that provide at least two levels of uniformly reduced lighting in the area:
 - One level between 50-70% of full power
 - Second level 35% or less of full power (0%, or OFF, complies with this level requirement)

- Control can be achieved through dimming lamps or luminaires, or step switching lamps, luminaires or rows.

Exceptions:

- Corridor lighting

Controls for Daylit Areas [Title 24, Section 131(c1)]

Required for: Areas greater than 250 ft² that receive effective light from daylight.

(Note that the method of calculating the daylight zones under top lighting has been changed in the 2005 Code.)

Requirements:

- Switch or dimmer control to reduce lighting by at least 50% in daylit area separately from lighting in non-daylit area of the enclosed space
- Daylit zones created by side lighting (windows) must be separately controlled from toplit zones (skylights).

Exception:

- Where glazing effective aperture is less than 0.1 for vertical glazing and 0.01 for horizontal glazing
- Where obstructions prevent effective use of daylighting

Automatic Controls for Daylit Areas [Title 24, Section 131(c2)]

Required for: Toplit daylit areas greater than 2500 ft² in a single space.

Requirements:

- Automatic multilevel daylighting controller with:
 - at least 2-level reduction, or
 - multilevel astronomic-based time switch with override switches

Exceptions:

- Where glazing effective aperture is too low
- Obstructions prevent effective use of daylighting

Automatic Shutoff [Title 24, Section 131(d)]

Required for: All interior lighting systems

Requirements:

- Occupancy sensor, time switch, or other device that automatically shuts off lighting
- Occupancy sensors and time switches must be certified by the California Energy Commission (CEC)
- If automatic time switch is used, it must provide:
 - holiday scheduling capability
 - readily accessible override control device in each space to turn the lighting on afterhours
 - override limit not exceeding two hours (malls, auditoriums, single-tenant retail spaces, industrial facilities and arenas can use a captive key switch to remain on longer)
 - override device controls a space no greater than 5,000 ft.² (malls, auditoriums, convention centers, single-tenant retail spaces, industrial facilities and arenas, controlled area allowed to 20,000 ft²)

Exception:

- Spaces serving areas that must be continuously lit
- Designated security or emergency egress areas not exceeding 0.5 watt/ft²
- Corridors, guest rooms, lodging quarters

Display Lighting [Title 24, Section 131(e)]

Required for: All display lighting

Requirements:

- Separately switched on circuits not exceeding 20 amps

Exterior Lighting Control [Title 24, Section 132(c)]

Required for: All permanently installed exterior lighting

Requirements

- Photocell or astronomic time switch
- Building facades, parking lots, garages, sales and non-sales canopies and outdoor sales areas with two or more luminaries need a time switch to turn lights off when not needed.

Exceptions:

- Lighting in large covered areas that require illumination during daylight hours (i.e., tunnels, parking garages, large covered areas)
- Motion and photocell controlled lights, some stairs, health or life safety, temporary or 24/7 lighting, or signs.

Certification of Lighting Control Devices

Title 24 also sets forth requirements for the certification of specific devices (see also TB#155). Devices include time switches, occupancy sensors, and photocells, and must be listed in the "Directory of Certified Ventilation and Lighting Control Devices."

Certification requires a range of requirements for each type of device, including:

- device accompanied by step-by-step instructions for installation and start-up
- device contains visible or audible indicator of proper operation
- time switches provide weekday and weekend schedule programming capabilities
- time switches have at least 10 hours program backup capability in case of power interruption
- time delay in occupancy sensors not exceed 30 minutes after space is vacated
- ultrasonic and microwave sensors provide adjustable sensitivity settings to reduce false triggers
- daylighting devices must be accurate, with minimum 10% setpoint scales, and switching based devices must include time delay and deadband settings to reduce lamp cycling.

Lighting Control Acceptance [Title 24, Section 131(f)]

Required for: All installed lighting control devices (occupancy sensors, time-based controls, daylighting controls)

Requirements:

- Compliance with Part 6 requirements for plans, specifications, installation certificates, and operating and maintenance information.