

LIGHTING CONTROLS APPLICATION GUIDE

TITLE 24 2016



sixteen**5**hundred
BRINGING IDEAS TO LIGHT

NON-RESIDENTIAL & HIGH-RISE RESIDENTIAL INDOOR AREAS (Section 130.1 a-d; 130.5d)		MINIMUM REQUIRED CONTROL TYPE						
		A	B	C		D	R	E
		Manual Control		Auto-Shut-Off		Automatic Daylighting Control	120V Outlet Control	Demand Response
AREA TYPE*	Size (Sqft)	On/Off	Multi- Level	Occupant Sensor	Auto Time Switch			
Offices	≤250	A1	B1	C1		D1	R1	E1
	>250	A1	B1		C2	D1	R1	E1
Offices—Open	≤250	A1	B1	C1		D1	R1	E1
	>250	A1	B1		C2	D1	R1	E1
Conference Room	ALL	A1	B1	C1		D1	R1	E1
Multi-Purpose Room	<1000	A1	B1	C1		D1	R2	E1
	≥1000	A1	B1		C2	D1	R2	E1
Copy Room	≤250	A1	B1	C1		D1	R1	E1
	>250	A1	B1		C2	D1	R1	E1
Office Kitchen Area	ALL	A1	B1		C2	D1	R1	E1
Corridor	ALL	A2		C3		D1		E1
Common Area Corridor (Resi)**	ALL	A2		C4		D1		E1
Stairwell	ALL	A2		C3		D1		E1
Stairwell (Resi)**	ALL	A2		C4		D1		E1
Lobby	ALL	A1	B1	C3		D1	R1	E1
Bathroom—Single Stall	<70	A1	B1		C5	D1		E1
Restroom—Public Single Stall	ALL	A1	B2		C2	D1		E1
Restroom—Public 2+ Stalls	ALL	A2	B2		C2	D1		E1
Closet (Resi)**	<70	A1	B1		C5	D1		E1
Warehouse—Open Area	ALL	A1		C6		D1		E1
Warehouse—Aisle	ALL	A3		C6		D1		E1
Server Room—Aisle	ALL	A3	B1		C5	D1		E1
Electrical Rm. Subj. CEC 110.26(D)	ALL	A1	B1			D1		E1
Classroom	ALL	A1	B3	C1		D1		E1
Library Stack Aisle***	ALL	A3		C7		D1		E1
Loading and/or Unloading	ALL	A1			C8	D1		E1
Parking Garage (Interior Areas)	ALL	A2			C8	D2		E1
Parking Garage Roof/Outdoor	SEE OUTDOOR LIGHTING CONTROLS							
Dwelling Units			SEE					
Hotel/Motel Guest Rooms			INDOOR RESIDENTIAL AREAS					
Dwelling Accommodations for Dormitories, Senior Housing, and Fire Stations								
INDOOR AREAS NOT LISTED	ALL	A1	B1	C2	D1		E1	

NOTES:

*Area Types in this table are as defined in T24 Parts 1 and 6 and apply to areas/rooms based on the activities or use in the room/area or space and not necessarily on the name of the room/area shown on the plans.

**These areas apply to High-Rise Residential (4 or more habitable stories) and Hotel/Motel only.

***Applies only to library book stack aisles that are 10' or longer (if dead-ended), and 20' or longer (if accessible from both ends).

KEY DEFINITIONS:

OFFICE AREA: any room or area in a building of CBC Group B Occupancy in which business, clerical, or professional activities are conducted, regardless of its assigned room name.

BATHROOM: A residential room or area containing a sink use for personal hygiene, toilet, shower, or tub.

RESTROOM: A non-residential room or area providing personal facilities such as toilets and washbasins.

DAYLIGHT TRANSITION ZONE (Parking Garage): the interior path of travel needed to transition from exterior daylighting levels to interior light levels. Excludes adjacent parking areas.

DEDICATED RAMPS: parking garage ramps that do not have adjacent parking.

KEYED NOTES FOR EACH SPACE/AREA TYPE	GENERAL NOTES FOR EACH CONTROL TYPE
<p>A1 REQUIRED. Must be located within the room and accessible to users. EXCEPT, in Malls, Atria, Auditorium areas, Retail Merchandise Sales areas, Wholesale Showroom areas, Commercial/Industrial Storage and Work areas, Convention Centers, and Arenas, the control may be located in other areas provided the user can see the controlled lighting, or the status of the controlled lighting is announced to the user.</p> <p>A2 REQUIRED. May be inaccessible to unauthorized personnel.</p> <p>A3 Same as A1, and independent MANUAL control not required for each aisle.</p>	<p>MULTI-LEVEL: Must provide the required steps required under column B.</p> <p>OVERRIDES: Other controls may not disable functionality of required manual controls.</p> <p>SEPARATE CONTROL: General, floor & wall display, window display, case display, ornamental, and special effects lighting must each have independent manual control. Track heads NOT EXEMPT.</p> <p>MEANS OF EGRESS LIGHTING: <u>Qualifying</u>* egress lighting must be controlled separately; control accessible only to authorized personnel. *To <u>qualify</u>, egress lighting may be up to 0.2W/sqft of lighting in areas properly designated on the submissions under Part 1/Section 10-103(a)2 may be continuously illuminated.</p>
<p>B1 REQUIRED, unless area lighting power $\leq 0.5W/sqft$ OR area is < 100 sqft. See table 130.1-A for specifics.</p> <p>B2 REQUIRED, one control step between 30%-70% of full rated power.</p> <p>B3 REQUIRED, however, if connected general lighting is $\leq 0.7W/sqft$ one control step is required between 30%-70% of full rated power.</p>	<p>APPLICATION: <u>These requirements apply only to general lighting.</u></p> <p>OTHER PROVISIONS: exception from this requirement does not except multi-level operation/control required by other provisions, such as Partial-ON, Partial-OFF, Auto-Daylighting-Control, and/or Demand Responsive Control requirements.</p>
<p>C1 REQUIRED. Auto-ON operation limited to 50-70% power.</p> <p>C2 REQUIRED. Auto-Shut-Off by occupancy sensor, <u>or</u> Auto-Time-Switch.</p> <p>C3 REQUIRED. Auto-ON operation (to 100%) by occupancy sensor required. Partial-OFF by occupancy sensor required (to 50% power or lower after vacancy). Full Auto-Shut-Off required—by occupancy sensor (max. 20 min. delay) <u>or</u> by Auto-Time-Switch (during typically unoccupied times).</p> <p>C4 REQUIRED. Auto-ON operation (to 100%) by occupancy sensor required. Partial-OFF by occupancy sensor required (to 50% power or lower after vacancy). Full Auto-Shut-Off required by occupancy sensor (max. 20 min. delay).</p> <p>C5 REQUIRED. Auto-Shut-Off by occupant sensing device, <u>or</u> Auto-Time-Switch, <u>or</u> Countdown-Timer-Switch. Countdown timer switch max setting 10 minutes for Bathrooms, 30 minutes for Server Aisles.</p> <p>C6 REQUIRED. Partial-OFF to 50% power or lower by occupancy sensor required (60% or lower for MH or HPS lighting or lighting with power $< 80\%$ of allowable power under the Area Category Method. Full Auto-Shut-Off required—may be by occupancy sensor (max. 20 min. delay) or by Auto-Time-Switch (during typically unoccupied times). Each open area and aisle way must be controlled separately—no overlapping.</p> <p>C7 REQUIRED. Partial-OFF to 50% power or lower by occupancy sensor required. Full Auto-Shut-Off required—may be by occupancy sensor (max. 20 min. delay) or by Auto-Time-Switch (during typically unoccupied times). Each open area and aisle way must be controlled separately—no overlapping.</p> <p>C8 REQUIRED. Auto-ON operation (to 100%) by occupancy sensor required. Partial-OFF by occupancy sensor required after vacancy (to 20%-50% of design power; 20%-60% if MH $> 75Lm/W$) by occupancy sensor required. Full Auto-Shut-Off required by occupancy sensor (max. 20 min. delay). Control Granularity: No more than 500 watts of rated lighting power shall be controlled together as a single zone.</p>	<p>Additional HVAC integration for rooms w/ occupancy sensor:</p> <ol style="list-style-type: none"> Multipurpose room less than 1,000 sqft, classrooms greater than 750 sqft and conference, convention, auditorium and meeting center rooms greater than 750 sqft that do not have processes or operations that generate dusts, fumes, vapors or gasses shall be equipped with occupant sensor(s) to: A) Automatically setup the operating cooling temp. set point and setback the operating heating temp. set point by 2°F or more; and B) Automatically reset the minimum required ventilation rate with an occupant sensor ventilation control device according to Section 120.1(c)5. <p>Where AUTO-TIME-SWITCH controls are used to comply:</p> <ol style="list-style-type: none"> Overrides: Auto-Time-Switch OFF function may be overridden for up to 2-hours during typically unoccupied times. EXCEPTION: malls, auditoriums, single-tenant retail, industrial, and arenas, provided a captive-key override is used. Granularity: Areas over 5,000 sqft must be divided into multiple zones of control each with a maximum of 5,000 sqft (20,000 sqft in Malls, Auditoriums, Single-Tenant Retail, Industrial, Convention Centers, and Arenas)
<p>D1 REQUIRED if the total glazing in the room/area is 24sqft or greater, <u>and</u> the total combined power of installed lighting in the Primary Sidelit and Skylit Zones is 120 Watts or more. Multi-level daylight control per Table 130.1-A is required if controlled lighting has a power density 0.3W/sqft or greater. In controlled areas, when daylight provides $> 150\%$ of the design illuminance received from the general lighting system at full power, lighting power in the daylight zone must be reduced by at least 65%. Secondary Daylit Zone must be controlled independently if using Prescriptive Compliance Approach. <u>Applies only to general lighting.</u></p> <p>D2 REQUIRED if the total glazing/opening in the area is 36sqft or greater, <u>and</u> the total combined power of installed lighting in the Primary Sidelit Zone is 60 Watts or more. Daylighting control may be ON/OFF, continuous dimming, or multi-level/step. Secondary Daylit Zone must be controlled together with the Primary. In a combined Primary/Secondary Zone, when daylight provides $> 150\%$ of the illuminance of controlled lighting alone (at the point of lowest illuminance in the Zone), lighting in that Zone shall be OFF/consume zero power. <u>Applies only to general lighting.</u> EXCEPTION: Luminaires in Daylight Transition Zones and Dedicated Ramp Areas.</p>	
<p>R1 REQUIRED. Each area must have at least 1 controlled receptacle within 6 feet of any controlled receptacle; or all half-controlled split-wired receptacles. Controlled receptacles must be permanently marked. Control may be by local occupancy sensor or auto-time-switch.</p> <p>R2 REQUIRED (as required in R1) if the Multi-Purpose room can be classified as an "Office Area" (see "Important Definitions" in this guide).</p>	<ol style="list-style-type: none"> Hardwired plug strips controlled by an occupancy sensor are acceptable. Exceptions: 1) dedicated receptacles for refrigerators and water dispensers in kitchen areas; 2) clock receptacles above 6' A.F.F.; and 3) receptacles in copy rooms for network copiers, faxes, A/V and data equipment (not personal computers). 4) receptacle circuits rated more than 20A. 5) Receptacles connected an UPS.
<p>E1 REQUIRED if the installed lighting within this area/space is greater than 0.5W/sqft, <u>and</u> if this area (space) is located within a building having more than 10,000 sqft. Lighting in this area must, together with all other areas within the building requiring Demand Responsive control, be capable of reducing power by at least 15% during the Demand Response Period. The controls must be capable of receiving and responding to at least one standards-based messaging protocol. Applies to all lighting except that which not permitted to be reduced by health or life safety statute, ordinance, or regulation. Such lighting shall not be counted toward lighting power under this requirement.</p>	

NON-RES. & HIGH-RISE RES. LUMINAIRE ALTERATIONS & MODIFICATIONS IN PLACE	MINIMUM REQUIRED CONTROL TYPE						
	A	B	C		D	R	E
	Manual Control		Auto-Shut-Off		Automatic Daylighting Control	120V Outlet Control	Demand Response
On/Off	Multi- Level	Occupant Sensor	Auto Time Switch				
Reinstall < 10% of Existing Luminaires	existing provisions permitted						
Reinstall ≥ 10% of Existing Luminaires**	existing provisions permitted						
Power* ≤ 85% (140.6 - Area Category)	A	B	C			R	
Power* > 85% (140.6 - Area Category)	A	B	C		D	R	E
Replace/Add Luminaires**	existing provisions permitted						
Power* ≤ 85% (140.6 - Area Category)	A	B	C			R	
Power* > 85% (140.6 - Area Category)	A	B	C		D	R	E
Changes in enclosed space**	existing provisions permitted						
Power* ≤ 85% (140.6 - Area Category)	A	B	C			R	
Power* > 85% (140.6 - Area Category)	A	B	C		D	R	E
Luminaire Component Modifications Section 141.0(b)2Ji	existing provisions permitted						
< 70 Luminaires per Annum	existing provisions permitted						
≥ 70 Luminaires per Annum**	existing provisions permitted						
Power* ≤ 85% (140.6 - Area Category)	A	B	C			R	
Power* > 85% (140.6 - Area Category)	A	B	C		D	R	E

NOTES:

*Resulting lighting power of enclosed space compared to lighting power allowance in Section 140.6(c)2, Area Category Method

** **MUST also meet lighting power allowance in Section 140.6**

KEY DEFINITIONS:

ENTIRE LUMINAIRE ALTERATION TYPES:

1) removing and reinstalling of existing luminaires; 2) replacing or adding entire luminaires; 3) adding, removing or replacing walls or ceilings along with any redesign of the lighting system

LUMINAIRE COMPONENT MODIFICATIONS TYPES:

1) ballast, drivers, and lamp replacements in the luminaire; 2) permanent changing of the lighting source of the luminaire; 3) changing optical system of the luminaire

KEYED NOTES FOR EACH TYPE	
A	Reference Non-Residential & High-Rise Residential Indoor Areas Control Matrix on page 2.
B	Applicable ONLY for alterations to general lighting of enclosed spaces ≥ 100 sqft and lighting load ≥ 0.5W/sqft. Reference Non-Residential & High-Rise Residential Indoor Areas Control Matrix on page 2. Alternative option to multi-level controls in Section 130.1(b) for Power ≤ 85% allowance: For each enclosed space, a minimum of one step between 30-70% of lighting power regardless of luminaire type is allowed.
C	Reference Non-Residential & High-Rise Residential Indoor Areas Control Matrix on page 2.
D	Reference Non-Residential & High-Rise Residential Indoor Areas Control Matrix on page 2.
R	Applicable ONLY when electrical power distribution systems is entirely new or a complete replacement. Reference Non-Residential & High-Rise Residential Indoor Areas Control Matrix on page 2.
E	Applicable ONLY for alterations > 10,000 sqft in a single building, where the alteration also changes the area of the space, or changes the occupancy type of the space, or increases the lighting power.

**TABLE 130.1-A
MULTI-LEVEL CONTROLS AND UNIFORMITY REQUIREMENTS**

Luminaire Type	Minimum Required Control Steps (percent of full rated power ¹)	Uniform level of illuminance shall be achieved by:			
Line-voltage sockets except GU-24	Continuous dimming 10-100 percent				
Low-voltage incandescent systems					
LED luminaires and LED source systems					
GU-24 rated for LED					
GU-24 sockets rated for fluorescent > 20 watts	Continuous dimming 20-100 percent				
Pin-based compact fluorescent > 20 watts ²					
GU-24 sockets rated for fluorescent ≤ 20 watts	Minimum one step between 30-70 percent	Stepped dimming; or Continuous dimming; or Switching alternate lamps in a luminaire			
Pin-based compact fluorescent ≤ 20 watts ²					
Linear fluorescent and U-bent fluorescent ≤ 13 watts					
Linear fluorescent and U-bent fluorescent > 13 watts	Minimum one step in each range:				Stepped dimming; or Continuous dimming; or Switching alternate lamps in each luminaire, having a minimum of 4 lamps per luminaire illuminating the same area and in the same manner
	20-40 %	50-70 %	75-85 %	100 %	
Track Lighting	Minimum one step between 30 – 70 percent				Step dimming; or Continuous dimming; or Separately switching circuits in multi-circuit track with a minimum of two circuits.
HID > 20 watts	Minimum one step between 50 - 70 percent	Stepped dimming; or Continuous dimming; or Switching alternate lamps in each luminaire, having a minimum of 2 lamps per luminaire, illuminating the same area and in the same manner.			
Induction > 25 watts					
Other light sources					
<p>1. Full rated input power of ballast and lamp, corresponding to maximum ballast factor</p> <p>2. Includes only pin based lamps: twin tube, multiple twin tube, and spiral lamps</p>					

NON-RES. & HIGH-RISE RES. OUTDOOR APPLICATIONS	MINIMUM REQUIRED CONTROL TYPE					
	A			B		C
	Automatic Day/Night Control			Motion Sensor		Demand Response
Timeclock	Photocell	Part Night	On/Dim	On/Off		
OUTDOOR LIGHTING **						
Health / Life Safety Lighting *	excepted					
Tunnel Lighting Required ON 24hr/365day	excepted					
Incandescent Lighting Rated >100W/each					B1	
Outdoor Sales Frontage			A3 or	B3		
Building Façade, Ornamental Hardscape or Dining	A4 or		A3 or	B3		
All other	A1 or	A2				
LUMINAIRES MOUNTED AT OR BELOW 24'						
Pole Mounted Rated >75W/each	A1 or	A2		B2		
Non-Pole Mounted Rated >30W/each	A1 or	A2		B2		
Linear Rated >4W/per foot	A1 or	A2		B2		
Wallpacks for Building Façade, Ornamental Hardscape or Dining	A1 or	A2		B2		
LUMINAIRES MOUNTED ABOVE 24'						
Pole Mounted Rated ≤75W/each	A1 or	A2				
Non-Pole Mounted Rated ≤30W/each	A1 or	A2				
Linear Rated ≤4W/per foot	A1 or	A2				
SIGN LIGHTING						
Indoor Sign	A5					
Outdoor Sign	A1 or	A6				
Outdoor sign in tunnel/large covered areas Required ON 24hr/365day	excepted					
Outdoor Sign ON both day & night	A1 A7 or	A6 A7				
Outdoor sign in tunnel/large covered areas ON both day & night	excepted					
Electronic Message Centers (EMC) over 15kW						C1

NOTES:

*Lighting NOT permitted to be shut OFF because of statute (health, life safety), ordinance, or regulation

** Listed Special Applications

Except those luminaires where more than 50% of light from the luminaire falls on one or more of the following (other requirements still apply)

1. Temporary outdoor lighting.
2. Lighting required and regulated by the Federal Aviation Administration, and the Coast Guard.
3. Lighting for public streets, roadways, highways, and traffic signage lighting, including lighting for driveway entrances occurring in the public right-of-way.
4. Lighting for sports and athletic fields, and children's playgrounds.
5. Lighting for industrial sites, including but not limited to, rail yards, maritime shipyards and docks, piers and marinas, chemical and petroleum processing plants, and aviation facilities.
6. Lighting of public monuments.
7. Lighting of stairs, wheelchair elevator lifts for American with Disabilities Act (ADA) compliance, and ramps that are other than parking garage ramps.
8. Landscape lighting.
9. In theme parks: outdoor lighting only for themes and special effects.
10. Lighting for outdoor theatrical and other outdoor live performances, provided that these lighting systems are additions to area lighting systems and are controlled by a multiscene or theatrical cross-fade control station accessible only to authorized operators.
11. Outdoor lighting systems for qualified historic buildings, as defined in the California Historic Building Code (Title 24, Part 8), if they consist solely of historic lighting components or replicas of historic lighting components. If lighting systems for qualified historic buildings contain some historic lighting components or replicas of historic components, combined with other lighting components, only those historic or historic replica components are exempt. All other outdoor lighting systems for qualified historic buildings shall comply with Section 140.7.

Luminaire Cut Off Requirements: Outdoor lighting >150 Lamp watts must comply with backlight, uplight and glare (collectively referred to as "BUG" in accordance with IES TM-15-11 Addendum A.

KEYED NOTES FOR EACH SPACE/AREA TYPE

A	A1 REQUIRED. Astronomical time-switch
	A2 REQUIRED. Must be an automatic photocontrol device capable of automatically shutting OFF outdoor lighting when daylight is available.
	A3 REQUIRED. Time or occupancy-based lighting control device or system that is programmed to reduce or turn off the lighting power to an outdoor luminaire for a portion of the night. Must have sunrise and sunset prediction accuracy within +/- 15 minutes and timekeeping accuracy within five minutes per year; and have the ability to setback or turn off lighting at night as required by means of a programmable timeclock or motion sensing device; and when controlled with a timeclock, shall be capable of being programmed to allow the setback or turning off of the lighting to occur from any time at night until any time in the morning, as determined by the user.
	A4 REQUIRED: Centralized time based zone lighting control capable of automatically reducing lighting power by at least 50%
	A5 REQUIRED: Automatic time switch or astronomical time switch.
	A6 REQUIRED. Must be an automatic photocontrol device in addition to automatic time switch control.
	A7 REQUIRED: In addition to A1 OR A6, all outdoor sign lighting that is ON both day and night shall be controlled with a dimmer that provides the ability to automatically reduce sign lighting power by a minimum of 65% during nighttime hours. Signs that are illuminated at night and for more than 1 hour during daylight hours shall be considered ON both day and night. EXCEPTION: Outdoor signs in tunnels and large covered areas that are intended to be illuminated both day and night.
B	B1 REQUIRED. Auto-ON operation (to 100%) by motion sensor required. Full Auto-Shut-Off required by motion sensor (max. 20 min. delay).
	B2 REQUIRED. Auto-ON operation (to 100%) by motion sensor required. Partial-OFF by motion required by at least 40% but not exceeding 90% OR provide continuous dimming through range that includes 40% to 90%. No more than 1500 watts of lighting power shall be controlled together.
	B3 REQUIRED. Auto-ON operation (to 100%) by motion sensor required. Partial-OFF by motion required by at least 40% but not exceeding 90%.
C	C1 REQUIRED An Electronic Message Center (EMC) having a new connected lighting power load greater than 1.5 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal. EXCEPTION: Lighting for EMCs that is not permitted by a health or life safety statute, ordinance, or regulation to be reduced by 30 percent.

RESIDENTIAL INDOOR AREAS

MINIMUM CONTROL REQUIREMENTS PER AREA

LIGHTING TYPE	JA8 * Required	MINIMUM CONTROL REQUIREMENTS PER AREA						
		Bathroom	Laundry Room	Utility Room	Small Closet	Hallway	Garage	All Other
HIGH-EFFICACY:								
All Ceiling Recessed Downlights	YES	A1	A1	A1	A3	A3	A1	A2
Screw-Base Lamps/Sources	YES	A1	A1	A1	A3	A3	A1	A2
Fluorescent—Pin-Based Linear or CFL Using Electronic Ballasts	NO	A1	A1	A1	A3	A3	A1	A3
Pulse-Start Metal Halide	NO	A1	A1	A1	A3	A3	A1	A3
High-Pressure Sodium	NO	A1	A1	A1	A3	A3	A1	A3
GU-24 Sockets (Non-LED)	NO	A1	A1	A1	A3	A3	A1	A3
GU-24 Sockets (LED)	YES	A1	A1	A1	A3	A3	A1	A2
Induction Lamps w/ High Frequency Generator	NO	A1	A1	A1	A3	A3	A1	A3
Inseparable SSL (e.g. LED) Luminaires w/ Colored Light Sources	NO	A1	A1	A1	A3	A3	A1	A3
Inseparable SLL (e.g. LED) Luminaires Installed Outdoors	NO	A1	A1	A1	A3	A3	A1	A3
Other Lighting Not Listed Above	YES	A1	A1	A1	A3	A3	A1	A2
Blank Electrical Boxes >5'A.F.F.	N/A							
NON-HIGH-EFFICACY: NOT PERMITTED ANYWHERE								

NOTES:

*JOINT APPENDIX (JA8): <https://cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx>

KEYED NOTES FOR EACH SPACE/AREA TYPE	GENERAL NOTES FOR EACH CONTROL TYPE
<p>A1 REQUIRED. At least one luminaire shall be controlled by a vacancy sensor (manual ON/ auto off).</p>	<p>DIMMERS: All forward phase cut dimmers used with LED light sources shall comply with NEMA SSL 7A.</p> <p>SEPARATE CONTROL:</p> <ol style="list-style-type: none"> Undercabinet lighting shall be switched separately from other lighting systems. Exhaust fans shall be switched separately with lighting systems. <p>EXCEPTION: Lighting integral to an exhaust fan may be on the same switch as fan providing lighting can be switched while allowing fan to continue to operate for an extended period of time.</p>
<p>A2 REQUIRED. Dimmers or vacancy sensor shall control all luminaires required to be JA8 compliant.</p> <p>EXCEPTIONS:</p> <ol style="list-style-type: none"> Luminaires in closets <70 sqft. Luminaries in hallways. 	
<p>A3 REQUIRED: Luminaires shall be switched with readily accessible controls that permit the luminaires to be manually switched ON/OFF.</p>	

RESIDENTIAL OUTDOOR AREAS

SINGLE FAMILY

Lighting attached to residence or other buildings on the same lot must be high efficacy with one of these controls.

- PHOTOCELL AND MOTION SENSOR or
- PHOTOCELL AND AUTO TIME SWITCH or
- ASTRONOMICAL TIME CLOCK

LOW RISE (3 or less habitable stories)

Have the option of complying with either the residential or nonresidential lighting standards for the following:

- A) Private patios B) Entrances C) Balconies D) Porches

MANDATORY REQUIREMENTS
(T24 PART 6 SECTION 130)

This guide is intended to assist in your selection of lighting control products and equipment for commercial type projects based on the mandatory requirements set forth in California's Title 24 2016 Section 130.



PERFORMANCE APPROACH
(T24 PART 6 SECTION 140.1)

OR

PRESCRIPTIVE APPROACH
(T24 PART 6 SECTION 140.2)

In addition to the mandatory requirements, either a Performance or Prescriptive approach must be used to determine full compliance for lighting and control systems. Using either approach may result in changes to the required control products and equipment based on project specific lighting selections and

Let us support YOU! **16500** SUPPORTS YOUR LIGHTING AND LIGHTING CONTROL NEEDS:

Lighting Control Applications Engineering:

- ⇒ Product/system selection and technical support
- ⇒ Wiring diagrams
- ⇒ CAD Assistance
- ⇒ System Layouts
- ⇒ Quotations
- ⇒ Submittals
- ⇒ Fixture-integrated controls coordination

Lighting Applications Engineering:

- ⇒ Product selection and technical support
- ⇒ Product specific lighting illuminance & power density calculations
- ⇒ Lighting layouts
- ⇒ Quotations
- ⇒ Submittals

16500 offers this guide in a partnership effort with you, our clients and customers who participate in our electrical lighting and controls specifications, construction, and property ownership/management communities. We invite you to use the lighting control application guide as a tool that will assist with product and equipment selection.

Please engage us with feedback as we strive to further develop and improve this application guide.