Kelly Cunningham,
Senior Customer Care Program Manager, Codes and Standards, Pacific Gas & Electric Company

EnergyCode Ace™
Helping you play your cards right

Learn More

Don't gamble on Title 24, Part 6 and Title 20 compliance.

Energy Code Ace: Lighting Solutions

Who we are:

- An energy efficiency program administered by Southern California Gas Company, Southern California Edison, San Diego Gas & Electric and PG&E on behalf of the CA Public Utilities Commission

We exist to…

- **Make it faster and easier** for each market actor in the compliance chain **to comply** with Title 24, Part 6 and Title 20

Our Approach…

- Understand each actor's unique workflow and what's in their way
  - Lack of knowledge/skill = Training
  - Lack of time/resources = Tools and Job Aides
- Work with market actors and code experts to develop solutions to code compliance hurdles
  - Develop minimal viable products and iterate with 'users'
- Gain the CEC's blessing and launch Tools, Training and Resources that meet actor's unique needs
- Deliver solutions through Energy Code Ace

Energy Code Ace: Lighting Solutions

TRAINING *Live with an instructor* *Or* *On your own*	✦ *Standards & Technology for Nonres Lighting* (Classroom) ✦ *Standards & Technology for Res Lighting* (Classroom) ✦ *Nonres Indoor Lighting Prescriptive Compliance* (Self Study) ✦ *Nonres Indoor Lighting Mandatory Measures* (Self Study) ✦ *Res Standards and Technology for Indoor Lighting* (Self Study)
TOOLS *Automated support to reduce cognitive load*	✦ **Reference Ace** – Navigate the Standards using key word search capabilities, hyperlinked tables and related sections ✦ **Forms Ace** – Determine which compliance forms are applicable to your specific project ✦ **Energy Code Ace JetPack** – Take a Turbo Tax type approach to nonres lighting projects
RESOURCES *Help at a glance*	✦ **Fact Sheets** – Quick reference summaries of key requirements, forms, definitions and resources ✦ **Application** Guides – Short manuals including compliance requirements and recommendations ✦ **Trigger Sheets** – Tables indicating...If you change that, these parts of the Code are triggered

CALIFORNIA ENERGY COMMISSION

- Establish scope of the next code cycle
- Administer public rulemaking process
- Consider (and approve) code change proposals
- Develop code change proposals
- Maintain compliance software

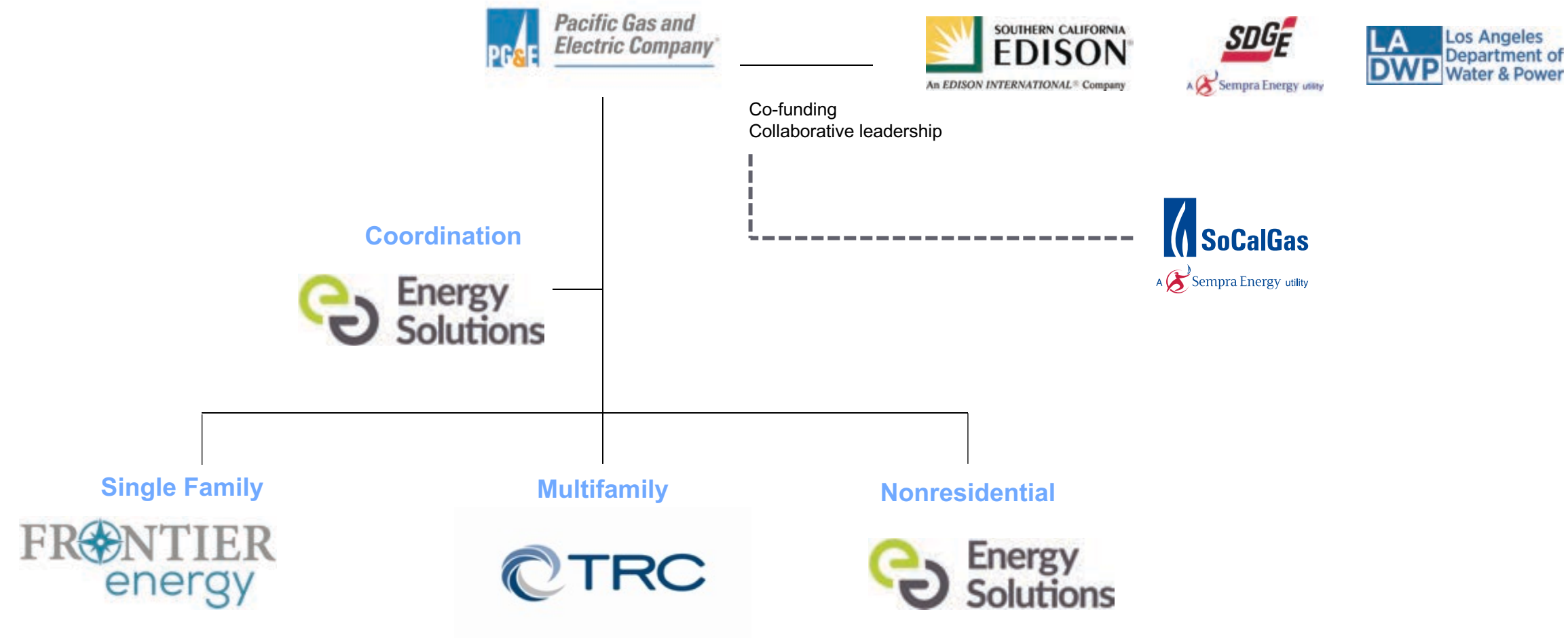
CALIFORNIA ENERGY CODES & STANDARDS
A STATEWIDE UTILITY PROGRAM

Participate in Energy Commission's rulemaking process:

- Develop code change proposals
- Support Energy Commission throughout rulemaking
- Provide data
- Offer feedback and suggest revisions
- Coordinate with other stakeholders and proposal submitters (i.e. CEA)

T24 2022: Statewide Utility Codes and Standards Team

Actively support the California Energy Commission in developing proposed changes to the California Energy Code (Title 24, Part 6 and portions of Part 11) to achieve significant energy savings and increase compliance for the 2022 code update, and beyond.



2022 Code Cycle Schedule

Energy Commission
Utility Team

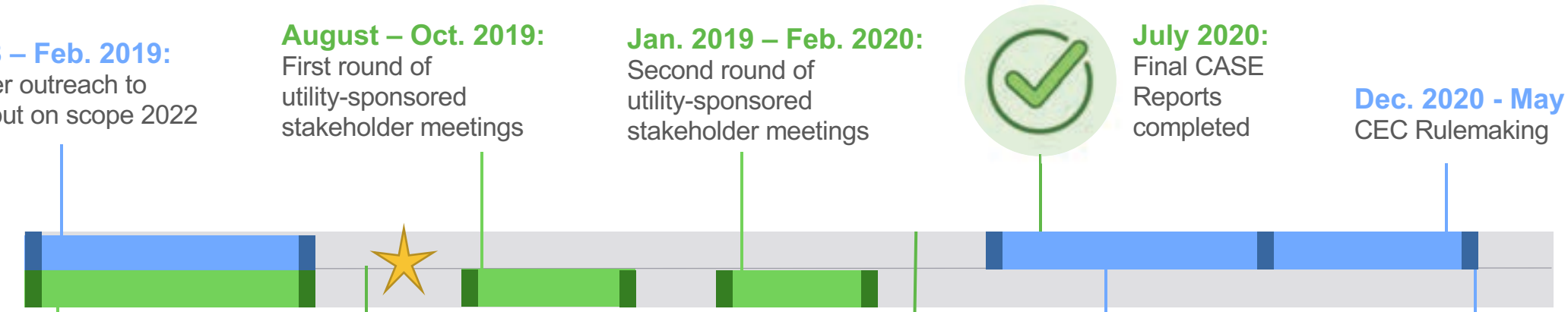
Oct. 2018 – Feb. 2019:
Stakeholder outreach to request input on scope 2022 code cycle

August – Oct. 2019:
First round of utility-sponsored stakeholder meetings

Jan. 2019 – Feb. 2020:
Second round of utility-sponsored stakeholder meetings

July 2020:
Final CASE Reports completed

Dec. 2020 - May 2021:
CEC Rulemaking



Oct. 2018 – Feb. 2019:
Select 2022 Measures

April. 2019:
Majority of work plans completed; Begin work on CASE Reports

Mar. – Apr. 2020:
Draft CASE Reports posted for public review

June – Dec. 2020:
CEC Pre-rulemaking

May 2021:
2022 Standards Adopted

To change the next generation of the Energy Code, what can you do?

- Clearly define your idea in writing
- Gather information on cost and energy impact
- Consider code enforcement impacts
- Work with the Commission
- Work with proposal submitters

Resources

Current and Past Code Cycle Proposals
https://title24stakeholders.com/

California Energy Commission:
https://www.energy.ca.gov/title24/

Energy Code Ace
https://energycodeace.com/

Key Contacts	
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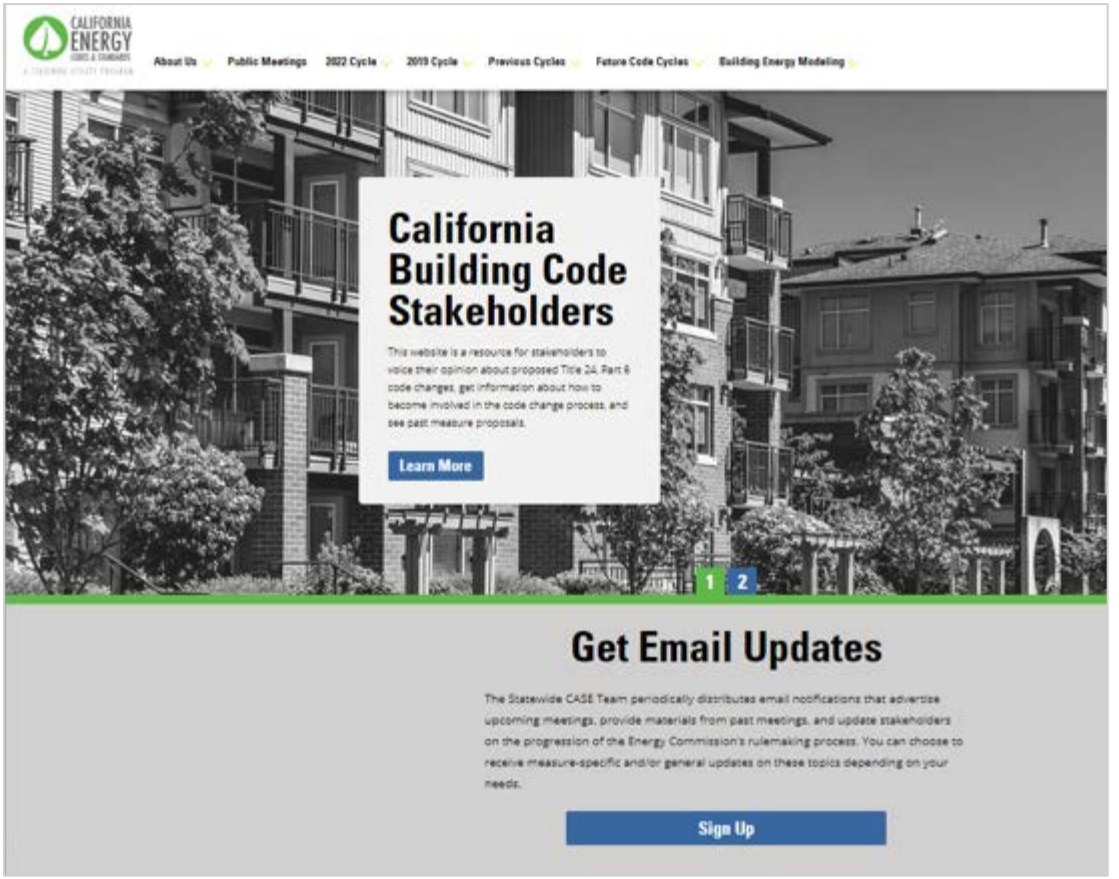


Appendix

EnergyCode Ace™
Helping you play your cards right

Welcome

DESCRIPTION OBJECTIVES CREDITS

This course focuses on residential lighting — how to meet or exceed California's 2016 Building Energy Efficiency Standards.

The course is for those who design, specify, install, plan check, or inspect residential indoor and/or outdoor lighting installations. The course may also be helpful to manufacturers who supply lighting devices, controls, and systems.

For this course, you will need to access many PDF files (using Adobe Acrobat Reader). Click the Information button in the lower left of this screen to download, for free, Reader if you do not have it.

Also be prepared to print PDF files if you choose to. There are some activities in this course that include PDF files – it will probably be easier for you to perform these activities if you can print the activity forms.

31% complete
My progress

Post-test
You can take the post-test as often as you like. The system will save your highest score.

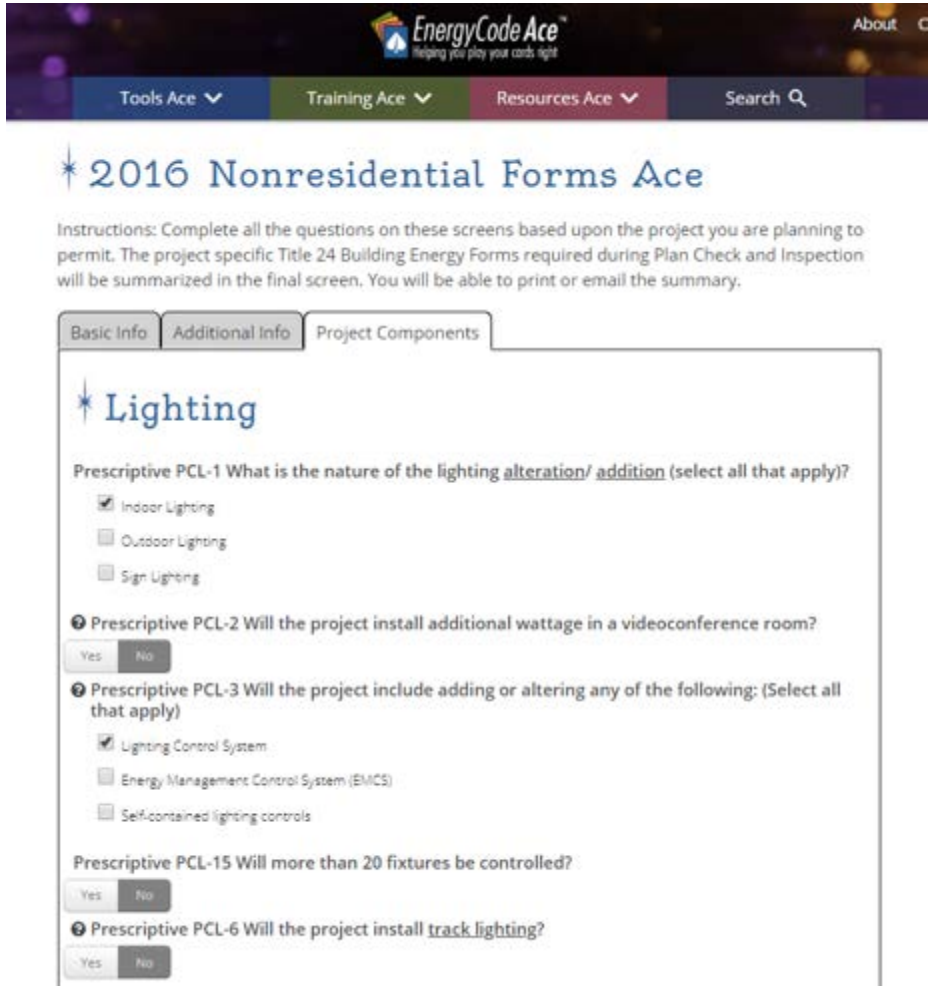
Continue where I left off...

Info Reference Help

Back Next

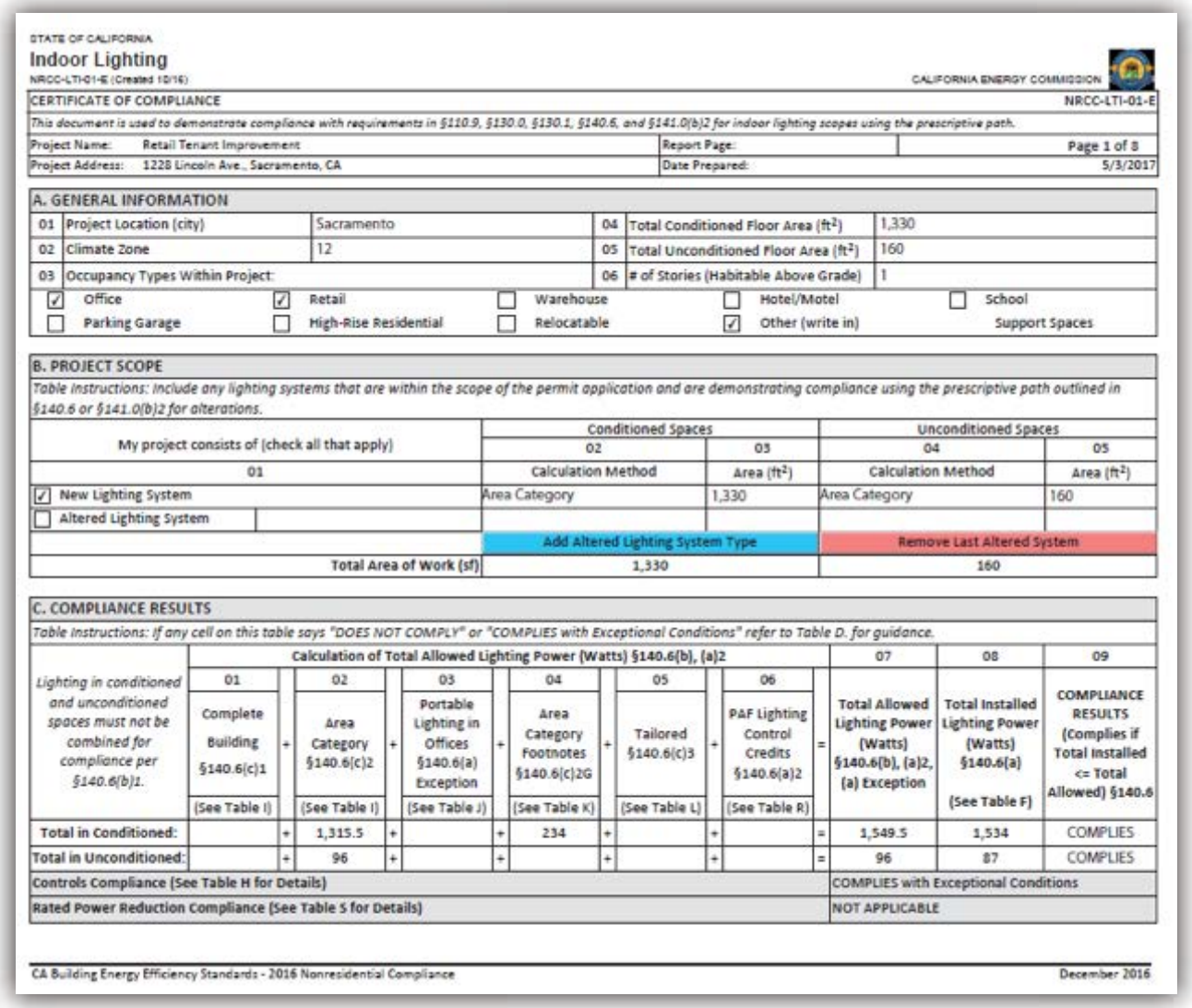
Ace Forms™

Aids in determining which compliance forms are applicable to your specific project



- Identify compliance steps
- Understand which compliance path is least cumbersome
- Identify which forms will be required
- Generate a checklist
- Identify whether or not your project requires HERS

Developed *with* CEC: *Dynamic Forms*



STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-01-E (Created 10/16) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — NRCC-LTI-01-E

This document is used to demonstrate compliance with requirements in §110.9, §130.0, §130.1, §140.6, and §141.0(b)2 for indoor lighting scopes using the prescriptive path.

Project Name:	Retail Tenant Improvement	Report Page:	Page 1 of 8
Project Address:	1228 Lincoln Ave., Sacramento, CA	Date Prepared:	5/3/2017

A. GENERAL INFORMATION

01	Project Location (city)	Sacramento	04	Total Conditioned Floor Area (ft²)	1,330
02	Climate Zone	12	05	Total Unconditioned Floor Area (ft²)	160
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1

☑ Office ☑ Retail ☐ Warehouse ☐ Hotel/Motel ☐ School
☐ Parking Garage ☐ High-Rise Residential ☐ Relocatable ☑ Other (write in) Support Spaces

B. PROJECT SCOPE

Table Instructions: Include any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.6 or §141.0(b)2 for alterations.

My project consists of (check all that apply)	Conditioned Spaces		Unconditioned Spaces	
	02	03	04	05
01	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☑ New Lighting System	Area Category	1,330	Area Category	160
☐ Altered Lighting System				
	Add Altered Lighting System Type		Remove Last Altered System	
Total Area of Work (sf)	1,330		160	

C. COMPLIANCE RESULTS

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

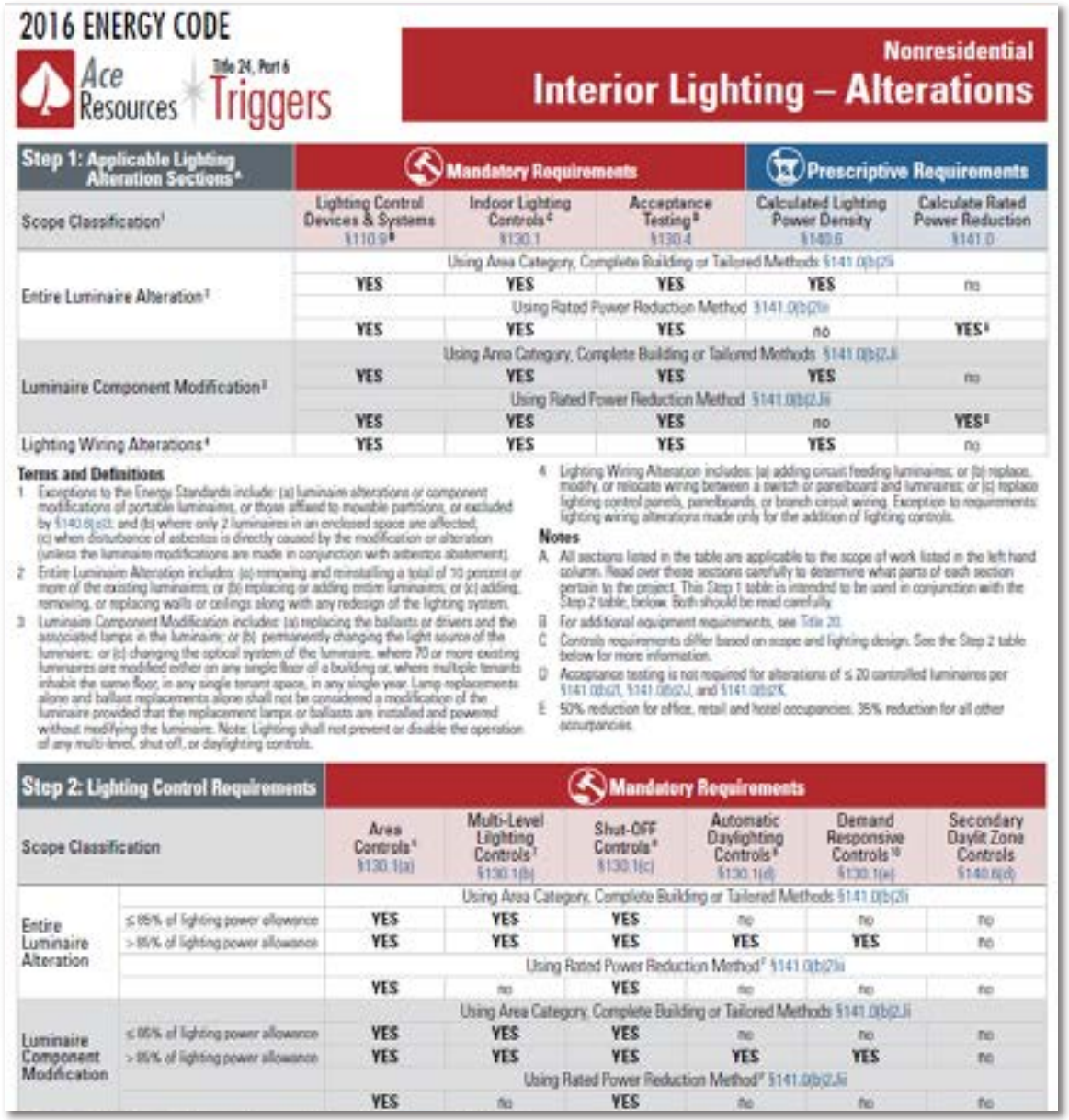
Lighting in conditioned and unconditioned spaces must not be combined for compliance per §140.6(b)1.	Calculation of Total Allowed Lighting Power (Watts) §140.6(b), (a)2							07	08	09
	01 Complete Building §140.6(c)1 (See Table I)	+ 02 Area Category §140.6(c)2 (See Table I)	+ 03 Portable Lighting in Offices §140.6(a) Exception (See Table J)	+ 04 Area Category Footnotes §140.6(c)2G (See Table K)	+ 05 Tailored §140.6(c)3 (See Table L)	+ 06 PAF Lighting Control Credits §140.6(a)2 (See Table R)	=	Total Allowed Lighting Power (Watts) §140.6(b), (a)2, (a) Exception	Total Installed Lighting Power (Watts) §140.6(a) (See Table F)	COMPLIANCE RESULTS (Complies if Total Installed <= Total Allowed) §140.6
Total in Conditioned:		+ 1,315.5	+	+ 234	+	+	=	1,549.5	1,534	COMPLIES
Total in Unconditioned:		+ 96	+	+	+	+	=	96	87	COMPLIES
Controls Compliance (See Table H for Details)								COMPLIES with Exceptional Conditions		
Rated Power Reduction Compliance (See Table S for Details)								NOT APPLICABLE		

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance — December 2016

#1 Complaint –
There are too many forms and too many pages!

Partnered with CEC and industry to develop a new form that:

- Leads you through the compliance process
- Presents only the pages necessary for your project
- Calculates allowed LPD
- Minimizes the number of signature pages



2016 ENERGY CODE

Ace Resources | Title 24, Part 6 Triggers

Nonresidential

Interior Lighting – Alterations

Step 1: Applicable Lighting Alteration Sections[A]	Mandatory Requirements			Prescriptive Requirements	
Scope Classification[1]	Lighting Control Devices & Systems §110.9[B]	Indoor Lighting Controls[C] §130.1	Acceptance Testing[D] §130.4	Calculated Lighting Power Density §140.6	Calculate Rated Power Reduction §141.0
Entire Luminaire Alteration[2]	Using Area Category, Complete Building or Tailored Methods §141.0(b)2i				
	YES	YES	YES	YES	no
	Using Rated Power Reduction Method §141.0(b)2ii				
	YES	YES	YES	no	YES[E]
Luminaire Component Modification[3]	Using Area Category, Complete Building or Tailored Methods §141.0(b)2Ji				
	YES	YES	YES	YES	no
	Using Rated Power Reduction Method §141.0(b)2Jii				
	YES	YES	YES	no	YES[E]
Lighting Wiring Alterations[4]	YES	YES	YES	YES	no

Terms and Definitions

1 Exceptions to the Energy Standards include: (a) luminaire alterations or component modifications of portable luminaires, or those affixed to movable partitions, or excluded by §140.6(a)3; and (b) where only 2 luminaires in an enclosed space are affected; (c) when disturbance of asbestos is directly caused by the modification or alteration (unless the luminaire modifications are made in conjunction with asbestos abatement).

2 Entire Luminaire Alteration includes: (a) removing and reinstalling a total of 10 percent or more of the existing luminaires; or (b) replacing or adding entire luminaires; or (c) adding, removing, or replacing walls or ceilings along with any redesign of the lighting system.

3 Luminaire Component Modification includes: (a) replacing the ballasts or drivers and the associated lamps in the luminaire; or (b) permanently changing the light source of the luminaire; or (c) changing the optical system of the luminaire, where 70 or more existing luminaires are modified either on any single floor of a building or, where multiple tenants inhabit the same floor, in any single tenant space, in any single year. Lamp replacements alone and ballast replacements alone shall not be considered a modification of the luminaire provided that the replacement lamps or ballasts are installed and powered without modifying the luminaire. Note: Lighting shall not prevent or disable the operation of any multi-level, shut-off, or daylighting controls.

4 Lighting Wiring Alteration includes: (a) adding circuit feeding luminaires; or (b) replace, modify, or relocate wiring between a switch or panelboard and luminaires; or (c) replace lighting control panels, panelboards, or branch circuit wiring. Exception to requirements: lighting wiring alterations made only for the addition of lighting controls.

Notes

A All sections listed in the table are applicable to the scope of work listed in the left hand column. Read over these sections carefully to determine what parts of each section pertain to the project. This Step 1 table is intended to be used in conjunction with the Step 2 table, below. Both should be read carefully.

B For additional equipment requirements, see Title 20.

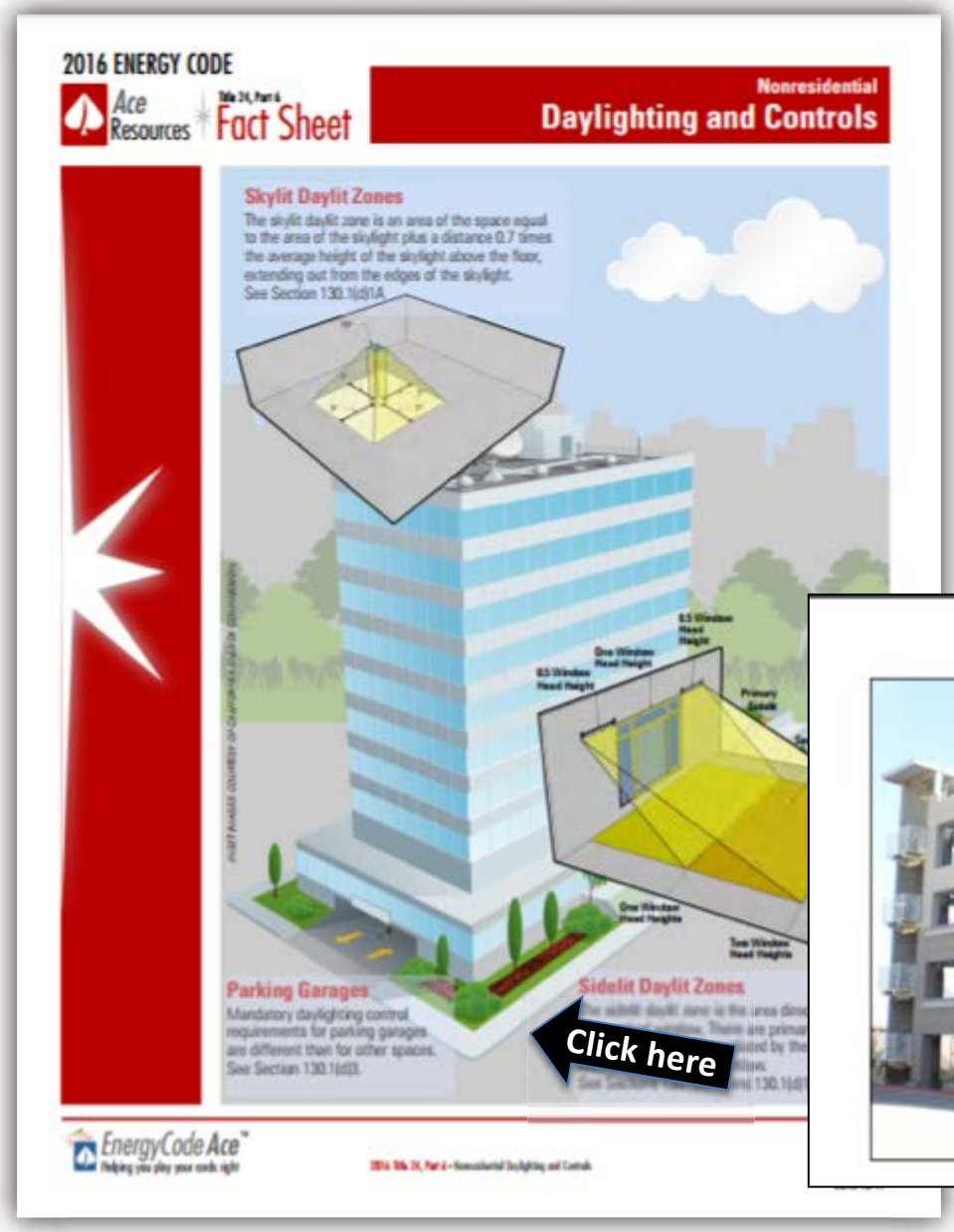
C Controls requirements differ based on scope and lighting design. See the Step 2 table below for more information.

D Acceptance testing is not required for alterations of ≤ 20 controlled luminaires per §141.0(b)2I, §141.0(b)2J, and §141.0(b)2K.

E 50% reduction for office, retail and hotel occupancies. 35% reduction for all other occupancies.

Step 2: Lighting Control Requirements		Mandatory Requirements					
Scope Classification		Area Controls[1] §130.1(a)	Multi-Level Lighting Controls[7] §130.1(b)	Shut-OFF Controls[8] §130.1(c)	Automatic Daylighting Controls[9] §130.1(d)	Demand Responsive Controls[10] §130.1(e)	Secondary Daylit Zone Controls §140.6(d)
Entire Luminaire Alteration		Using Area Category, Complete Building or Tailored Methods §141.0(b)2i					
	≤ 85% of lighting power allowance	YES	YES	YES	no	no	no
	> 85% of lighting power allowance	YES	YES	YES	YES	YES	no
		Using Rated Power Reduction Method[F] §141.0(b)2ii					
		YES	no	YES	no	no	no
Luminaire Component Modification		Using Area Category, Complete Building or Tailored Methods §141.0(b)2Ji					
	≤ 85% of lighting power allowance	YES	YES	YES	no	no	no
	> 85% of lighting power allowance	YES	YES	YES	YES	YES	no
		Using Rated Power Reduction Method[F] §141.0(b)2Jii					
		YES	no	YES	no	no	no

- For projects that are altering existing buildings or systems
- Tables listing typical changes you might make to a system telling you:
  If you change that, these parts of the Code are triggered
- Also notes whether it's a Mandatory Measure or Prescriptive requirement and indicates relevant code sections



Ace Resources Title 24, Part 6 Fact Sheet

- Infographic approach
- Engaging, simple illustrations
- Hyperlinks to relevant code sections and forms

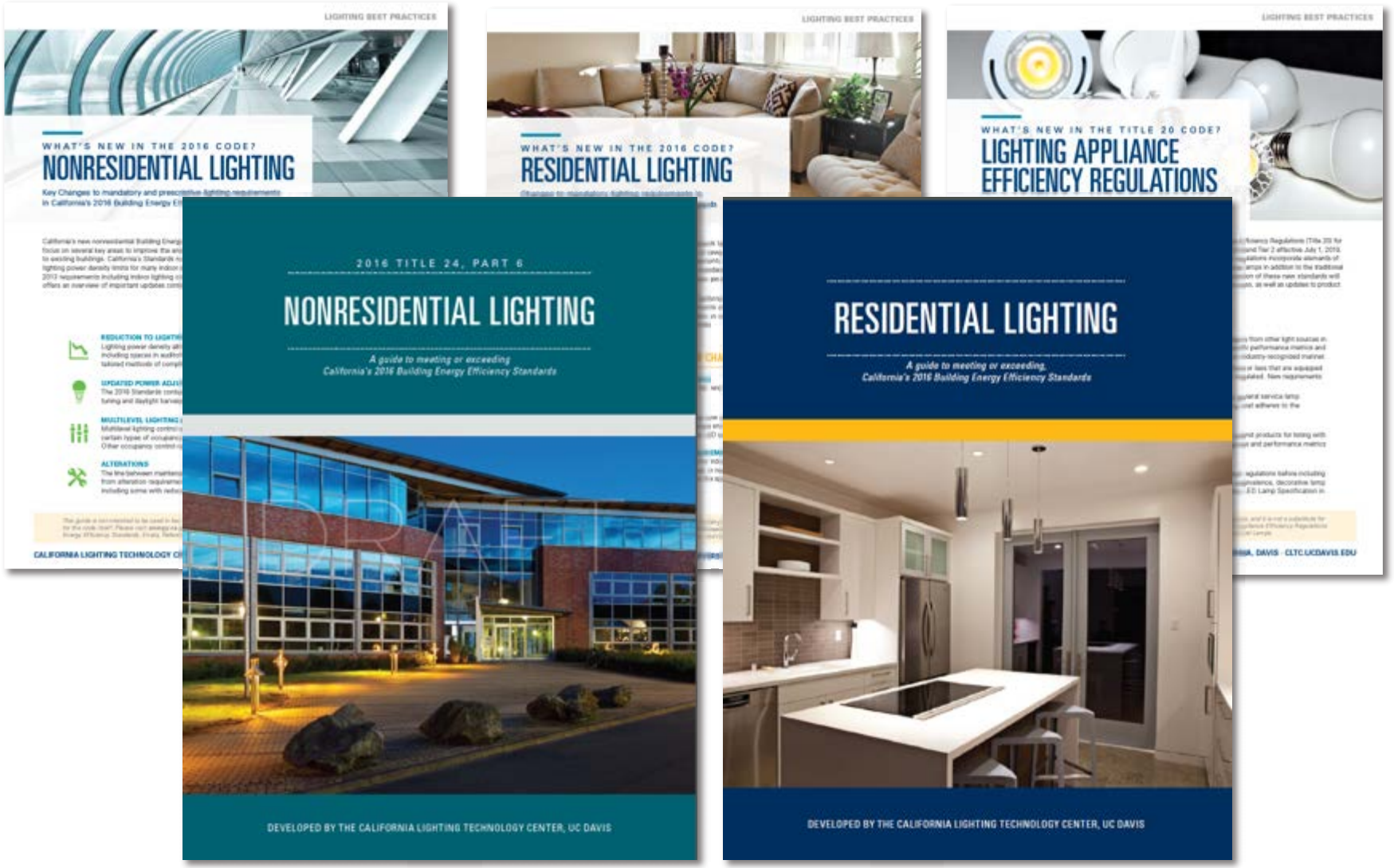
Parking Garages

Mandatory daylighting control requirements for parking garages are different than for other spaces. For instance, parking garage daylight controls are mandatory for secondary sidelit zones, whereas this is not the case for interior areas of the building.

Parking garages that have a combined glazing or opening area of 36 square feet or greater must also comply with the daylighting control requirements of the Energy Standards, except when the combined general lighting power in the primary daylit zones is less than 60 watts. Daylighting controls are not required in parking garage daylight transition zones, which is a vehicular path intended to provide a transition between exterior and interior illumination levels and does not include parking areas.

Primary and secondary daylit zones can be controlled together. Daylighting controls for parking garages can be on/off, where other spaces require continuous or stepped dimming controls. Lighting in the primary and secondary daylit zones of parking garages must be completely turned off, when the space is fully daylit. For other space types multilevel dimming can be used with the dimmed lights consuming up to 35% of full power.

Ace Resources™ Application Guides



EnergyCodeAce.com/resources