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Docket Number:	13-ATTCP-01
Project Title:	Acceptance and Training Certification
TN #:	247732
Document Title:	Executive Director Recommendation and Staff Evaluation CALCTP 2022 Update Report
Description:	Executive Director recommendation to approve the California advanced lighting controls training program proposed update report for the acceptance test technician certification provider amendment application for the 2022 building energy efficiency standards
Filer:	Daniel Wong
Organization:	California Energy Commission
Submitter Role:	Commission Staff
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RESOLUTION NO: 22-1116-01f

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

EXECUTIVE DIRECTOR RECOMMENDATION TO APPROVE THE CALIFORNIA ADVANCED LIGHTING CONTROLS TRAINING PROGRAM PROPOSED UPDATE REPORT FOR THE ACCEPTANCE TEST TECHNICIAN CERTIFICATION PROVIDER AMENDMENT APPLICATION FOR THE 2022 BUILDING ENERGY EFFICIENCY STANDARDS

Executive Summary

The acceptance test technician certification providers (ATTCP) program addresses training, certification, and oversight of acceptance test technicians (ATT), as well as the acceptance test employers (ATE). The technicians perform the tests required by the Building Energy Efficiency Standards (Energy Code), and the employers are responsible for the technician's work. ATTCPs are professional organizations that are approved to provide training curricula for ATTs and ATEs, certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures.

Acceptance testing ensures that installed equipment, controls, and systems in nonresidential buildings operate as required by the Energy Code. ATTCPs must submit an update report in the event that the California Energy Commission (CEC) approves an updated Energy Code. The 2022 Energy Code was approved by the CEC on August 11, 2021, approved by the California Building Standards Commission in December of 2021, and will go into effect on January 1, 2023. Update reports are subject to the application review and determination process specified in section 10-103.1(e).

The California Advanced Lighting Controls Training Program (CALCTP) submitted an update report to the CEC amending its application on June 27, 2022, as required by section 10-103.1(d)2 of the Energy Code. As specified in section 10-103.1(e) of the 2022 Energy Code, staff reviewed and validated all information received in the update report and determined that CALCTP meets most of the criteria and procedures in section 10-103.1(c) for providing acceptance testing certification services. Pursuant to section 10-103.1(e), the executive director posted the staff evaluation to docket number 13-ATTCP-01 (https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=13-ATTCP-01), provided an opportunity for public comment, and considered all comments received as of November 15, 2022.

CALCTP has not completed the database system for tracking completed acceptance tests as required by sections 10-103.1(c)3H and 10-103.1(c)3I. Staff has confidence that CALCTP will complete this task by December 1, 2022. Staff proposes a Condition of Approval to allow the CEC to approve the CALCTP 2022 Update Report. CALCTP will be required to demonstrate that the database is in full operation to the CEC by

December 1, 2022. Staff proposes that failure to demonstrate that the database is in full operation to the executive director's satisfaction by December 1, 2022, shall result in automatic termination of the ATTCP's approval of the CALCTP Update Report. The executive director shall issue a formal letter of determination regarding compliance with this condition by December 14, 2022. Failure to comply with any other requirement of COA-2022-1 may result in the CEC rescinding the ATTCP approval of the CALCTP 2022 Update Report.

The staff evaluation is included in Exhibit A.

Recommendation of the Executive Director

Based upon staff's review and validation of the CALCTP application amendments, I recommend that the CEC confirm these findings and approve the CALCTP 2022 Update Report subject to the condition that CALCTP complete the database system for tracking completed acceptance tests, as required by sections 10-103.1(c)3H and 10-103.1(c)3I by December 1, 2022.

Drew Bohan
Executive Director
California Energy Commission

October 26, 2022
Date

EXHIBIT A

Staff Evaluation – California Advanced Lighting Controls Training Program
2022 Update Report

Summary
Staff has verified and reviewed the California Advanced Lighting Controls Training Program (CALCTP) 2022 Update Report to confirm that it is complete and complies with most of the requirements in section 10-103.1(c) of the 2022 Building Energy Efficiency Standards (Energy Code) in regard to its acceptance test technician certification provider (ATTCP) application. Staff reviewed the confidential and non-confidential information and verified that all changes needed to meet the requirements of the 2022 Energy Code are represented in the CALCTP 2022 Update Report.

Exception:
Sections 10-103.1(c)3H and 10-103.1(c)3I require the implementation of a database system to track and record acceptance test activities and results of certified acceptance test technicians (ATTs). CALCTP was not able to fully implement the required database system. However, based on the progress made and the experience of CALCTP, staff is confident that CALCTP can complete the database system and satisfy the requirements in sections 10-103.1(c)3H and 10-103.1(c)3I by December 1, 2022. Staff recommends the following condition of approval (COA-2022-1) for the California Energy Commission (CEC) to consider and allow CALCTP to proceed with the required training as soon as possible. This will ensure that the ATTs responsible for compliance with the Energy Code are fully trained and their customers are able to realize the energy savings from the 2022 Energy Code requirements.

COA-2022-1: By December 1, 2022, CALCTP (or its representatives) shall perform all of the following:

- Develop and implement an online database web service in compliance with sections 10-103.1(c)3H and 10-103.1(c)3I.
- Submit all necessary evidence to the CEC to substantiate its claim of compliance with COA-2022-1.

Compliance:
CALCTP will demonstrate that the database is in full operation to the executive director. Once the executive director is satisfied with the performance of the database, they will provide CALCTP with a written acknowledgement of compliance by December 14, 2022. Failure to comply with any other requirement of COA-2022-1 may result in the CEC rescinding the ATTCP approval of the CALCTP.

Detailed Evaluation

The following tables identify all of the changes that may have affected the CALCTP update report. Staff considered all of these changes in its validation and review of the CALCTP 2022 Update Report.

Table 1: Changes within Title 24, Part 1

Section	Description of Change
10-102, Definition "Nonresidential Data Registry"	This change excludes certificates of acceptance recorded by an ATTCP from requiring additional submittal to separate data registries.
10-103(a)4B	This change excludes certificates of acceptance recorded by an ATTCP from requiring additional submittal to separate data registries.
10-103(a)4C	The change removes reference to registration or the use of data registries as it relates to certificates of acceptance.
10-103(d)	The change removes reference to registration or the use of data registries as it relates to certificates of acceptance.
10-103.1(c)3H	This change adds express criteria for electronic storage, within a database system, of compliance forms prepared and collected by ATTs.
10-103.1	The change to this section and its subsections is to add references to section 160.5(e) alongside existing references to section 130.4 consistent with the separation of multifamily building requirements, including acceptance testing requirements, into separate chapters in sections 160, 170, and 180 (inclusive).
10-103.1(c)3I	The purpose of the addition of this section is to add specifications for recording, maintaining, and providing certificate of compliance, certificate of installation, and certificate of acceptance documents collected by ATTCPs to the CEC.
10-109(i)1B	This change exempts Nonresidential Certificate of Acceptance (NRCA) forms recorded by an ATTCP from nonresidential data registry registration requirements.
10-114, Table 10-114-A	This change revises default rural lighting zone classifications as lighting zone 1 and to add urban clusters as the default classification for lighting zone 2. Building types deemed appropriate for lighting zones 1, 2, and 3 are added to Table 10-114-A. These changes align, where feasible, to the outdoor lighting zone default classification with the Illuminating Engineering Society/International Dark-sky Association (IES/IDA) Outdoor Lighting Model Ordinance lighting zone classification.

Table 2: 2022 Energy Code Changes

Section	Description of Change
100.0	The changes to these sections, their subsections, and associated Table are to relocate provisions describing the application of the Energy Code and, in doing so, to reflect changes occurring later in the document that relocate provisions applicable to multifamily buildings (inclusive of low-rise and high-rise multifamily buildings) into their own subsections. These edits include removing references to "high-rise residential" where no longer applicable, replacing low-rise residential" with "single-family," and updating references to include the new sections of the Energy Code relating to multifamily buildings (sections 160, 170, and 180 inclusive) consistent with the relocation.
100.0, Table 100.0-A	The changes to this table are to separate multifamily from the nonresidential and single-family building categories, and to add the new electric-ready sections to this table. Additionally, existing section references were updated to account for any change in section numbering resulting from additional changes to the Energy Code.
100.1(b), definition of "IES LM-79-19"	The specific purpose of the change is to update the reference document title and numbering to the most recent version of the document as issued by the Illuminating Engineering Society.
100.1(b), definition of "IES LS-1-20"	The specific purpose of the change is to update the reference document title and numbering to the most recent version of the document as issued by the Illuminating Engineering Society.
100.1(b), definition of "IES TM-15-20"	The specific purpose of the change is to update the reference document title and numbering to the most recent version of the document as issued by the Illuminating Engineering Society.
100.1(b), definition of "Accent Lighting"	The specific purpose of the change is to update the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20, and to include examples of accent lighting.
100.1(b), definition of "Automatic Daylight Control"	This change revises the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of "Automatic Multilevel Daylight Control"	This change removes the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code, and to remove obsolete terms, removing unnecessary complexity.
100.1(b), definition of "Color Rendering Index (CRI)"	This change updates the definition to align with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.

Section	Description of Change
100.1(b), definition of “Correlated Color Temperature (CCT)”	This change updates the definition to align with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “Colored Light Source”	This change revises the reference measurement methods and the reference calculation method for colored light sources.
100.1(b), definition of “Compact Fluorescent Lamp”	This change updates the definition to align with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “Daylight Continuous Dimming Controls”	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Decorative (lighting/luminaires)”	This change updates the definition to include examples in the definition for decorative lighting/luminaires.
100.1(b), definition of “Dimmer”	This change revises the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Dimmer, Continuous” (was Dimmer, Full Range)	This change revises the term to “Dimmer, Continuous” from “Dimmer, Full Range.”
100.1(b), definition of “Display Lighting, Floor” (was Display Lighting and Floor)	This change revises the definitions to combine both definitions for display lighting and floor as one definition for “Display Lighting, Floor.”
100.1(b), definition of “Display Lighting, Wall”	This change revises the definitions to combine both definitions for display lighting and wall as one definition for “Display Lighting, Wall.”
100.1(b), definition of “Display Lighting, Window”	This change revises the definitions to combine both definitions for display lighting and window as one definition for "Display Lighting, Window.”
100.1(b), definition of “Display Lighting, Case”	This change revises the definitions to combine both definitions for display lighting and case as one definition for “Display Lighting, Case.”
100.1(b), definition of “Illumination”	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.

Section	Description of Change
100.1(b), definition of “Inseparable Solid State Lighting (SSL) Luminaire”	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20, and to add examples to the definition for inseparable solid state lighting luminaires.
100.1(b), definition of “Light”	This change updates update the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “Lighting”	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “Light Emitting Diode” (LED)	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “LED Driver”	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “LED Light Engine”	This change updates the definition to align with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “Luminaire Alteration” (new)	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Luminous Maintenance” (was Lumen Maintenance)	This change updates the definition to align, where feasible, with the definition of the ENERGY STAR Program Product Specification for Luminaires (Light Fixtures) Version 2.2.
100.1(b), definition of “Luminaire”	This change revises the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Luminous Flux”	This change revises the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.

Section	Description of Change
100.1(b), definition of “Occupant Sensing Controls” (was Occupant Sensor)	This change updates the definitions (including Motion Sensor; Occupant Sensor; Partial-ON Occupant or Motion Sensor; Partial-OFF Occupant or Motion Sensor; Vacancy Sensor) with a change of phrase from “sensor” to “sensing control” to the terms of definition. These changes are to align with the use of the term in section 130.1(c) of Automatic Shutoff Controls, and the revised terms more accurately reflects of their characters as lighting controls.
100.1(b), definition of “Pendant Luminaire” (Suspended Luminaire) (was Pendant [Suspended])	This change adds luminaire to the name of the definition.
100.1(b), definition of “One-to-One Alteration” (new)	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Ornamental Lighting/Luminaires” (was Ornamental Lighting; Luminaires)	This change combines both definitions for ornamental lighting and luminaires as one definition for “Ornamental Lighting/Luminaires.” The other change is to separate out the sub-definition for decorative luminaires as an independent and separate definition for “Decorative Lighting/Luminaires.”
100.1(b), definition of “Portable Lighting”	This change revises the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Radiant Power”	This change revises the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Security Cameras”	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Task Lighting”	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.
100.1(b), definition of “Track Lighting”	This change updates the definition to align, where feasible, with the nomenclature and definitions for Illuminating Engineering Society of the reference document, ANSI/IES LS-1-20.

Section	Description of Change
100.1(b), definition of “Tunable Lighting”	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Dim-to-Warm”	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Tunable White” (new)	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Color Tunable” (new)	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Multifamily Building” (new)	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Museum Building” (Nonresidential Building Occupancy Types) (new)	This change adds the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code.
100.1(b), definition of “Barber, Beauty Salon, Spa Area” (was Beauty Salon Area)	This change updates the name of the nonresidential function areas to include barber and spa areas for the nonresidential function area definition.
100.1(b), definition of “Lobby, Main Entry” (was Main Entry Lobby)	This change reorders the name of the nonresidential function areas with “Lobby” as the preceding term for the nonresidential function area definition.
100.1(b), definition of “Laboratory, Scientific Area” (was Scientific Laboratory Area)	This change reorders the name of the nonresidential function areas with “Laboratory” as the preceding term for the nonresidential function area definition.

Section	Description of Change
100.1(b), definition of “Manufacturing, Commercial and Industrial Area” (was Commercial and Industrial Manufacturing Area)	This change reorders the name of the nonresidential function areas with “Manufacturing” as the preceding term for the nonresidential function area definition.
100.1(b), definition of “Storage, Commercial and Industrial Area” (was Commercial and Industrial Storage Area)	This change reorders the name of the nonresidential function areas with “Storage” as the preceding term for the nonresidential function area definition.
100.1(b), definition of “Parking Zone and Ramps” (was Parking Zone and Dedicated Ramps)	This change revises the definitions to combine both definitions for parking zone and dedicated ramps as one definition for “Parking Zone and Ramps.”
100.1(b), definition of “Daylight Adaptation” Zone	This change revises the definition to clarify adjacent areas of a parking garage are applicable to the nonresidential function area definition of daylight adaptation zone.
100.1(b), definition of “Dedicated Ramps” (removed)	This change removes the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code, and to remove obsolete terms, removing unnecessary complexity.
100.1(b), definition of “Overhang Projection” (removed)	This change removes the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code, and to remove obsolete terms, removing unnecessary complexity.
100.1(b), definition of “Overhang Rise” (removed)	This change removes the definition to provide clear and specific definitions for technical terms used within other updates to Part 6, aligned with the use of the term where it is proposed to occur later in the Energy Code, and to remove obsolete terms, removing unnecessary complexity.
110.9(b)5	This change removes part-night outdoor lighting controls and its functionality requirements. The criteria of this section define what a control installed to meet “part-night” requirements is required to do, however the underlying requirements to install “part-night” controls (distinct from other outdoor lighting controls) were removed in the 2019 update to the Energy Code.

Section	Description of Change
110.12(a)	The changes to this section more clearly state the communication requirements applicable to demand responsive controls. The term “hard-wiring” in particular was observed to be a common source of confusion and is adequately covered by “wired or wireless bi-directional communication pathway.”
110.12(c)	The changes to this section revise the floor area threshold to an equivalent wattage threshold, and more clearly state that the requirement of this section applies to lighting to which multi-level lighting requirements in section 130.1(b) also apply.
110.12(c)2 (new)	This addition clarifies which lighting systems are required to be controlled and can be controlled optionally when demand responsive lighting controls are required.
110.12(c)3 (new)	This addition relocates language related to uniform illumination in section110.12(c) to new subsection 110.12(c)3.
110.12(c), Exception 1 to 110.12(c) (removed)	This change removes the exception for spaces with lighting power density of 0.5 watts per square foot or less.
110.12(c), Exception to 110.12(c)	This change revises the exception from a floor area threshold to an installed wattage threshold.
110.12(e) (new)	The addition of section 110.12(e) adds specific requirements for the behavior of demand responsive controlled receptacles.
Subchapter 4	This change removes high-rise residential buildings from the scope of Subchapter 4 (sections 130.0-30.5). Lighting and electrical power distribution system requirements for multifamily buildings (including high-rise residential buildings) are covered in Subchapter 10.
130.0, 130.0(a) and 130.0(b)	The changes to these sections remove high-rise residential buildings and high-rise residential dwellings from the scoping requirements of section 130.0 because high-rise residential buildings and dwellings are being moved to new chapters of the proposed Energy Code.
130.0(c)	The changes update the luminaire classification and luminaire power determination for luminaires with line voltage lamp holders and revise the requirement to be based on the luminaire maximum rated wattage of section 130.0(c)1 and remove the 50 watts per socket threshold for recessed luminaires with line-voltage medium screw base socket.
130.1	This change removes high-rise residential buildings from the scope of section 130.1. Lighting requirements for multifamily buildings (including high-rise residential buildings) are covered in new section 160.5.

Section	Description of Change
130.1(a), Exception to 130.1(a)	This change revises the exception for lighting that are continuously illuminated for the means of egress illumination to be up to the same amount as permitted in section 130.1(c).
130.1(a)1, Exception to 130.1(a)1	This change clarifies that any restroom with two or more stalls and adds areas intended for access by the public to the list of areas exempt from the readily accessible requirement.
130.1(a)2, Exception 1 to 130.1(a)2	This change adds main entry lobbies and dining areas to the list of areas that do not require manual area controls to be in the same space as lighting being controlled.
130.1(a)3	This change allows scene controllers to be installed as specified for meeting the separate lighting control requirement of section 130.1(a)3.
130.1(b)	These changes relocate certain exceptions to this subsection's multilevel lighting control requirements from Table 130.1-A to the text body of section 130.1(b) and lowers the lighting power density threshold.
130.1(b), Exception 1 to 130.1(b)	This change exempts enclosed spaces with one inseparable solid state lighting (SSL) luminaire from the multilevel lighting control requirement.
130.1(c) Exception 2 (removed)	This change relocates the exception to Exception 3 to section 130.1(c)1.
130.1(c)1D (removed)	This change removes separate shut-OFF controls requirement for general lighting, display lighting, ornamental lighting, and display case lighting.
130.1(c)1E (removed)	This change removes language that is duplicative with section 130.1(a). Because all indoor lighting controls already require compliance with section 130.1(a), which requires manual on switches, it is not necessary to duplicate that requirement in section 130.1(c).
130.1(c)1, Exception 3 to 130.1(c)1 (Moving Exception 2 to 130.1[c])	This change moves "Exception 2 to section 130.1(c)" to "Exception 3 to section 130.1(c)1" as part of the Exception 3.
130.1(c)3B, Exception	This change adds "laboratories" to the list of areas to be allowed to have an automatic time-switch control override of longer than two hours.
130.1(c)5	This change replaces the phrase "sensor" with "sensing controls."

Section	Description of Change
130.1(c)6	This change adds the mandatory requirements for full or partial OFF occupancy sensing controls for aisle ways, open area in warehouses, library book stack aisles, corridors and stairwells, and office spaces greater than 250 square feet. The other specific purpose of the change is to revise the term “general lighting” to “lighting” for meeting the requirements of section130.1(c)6.
130.1(c)6D (new)	This addition establishes requirements for partial OFF occupancy sensing controls in offices greater than 250 square feet and functionality requirements for these controls.
130.1(c)7	This change revises the term “general lighting” to “lighting” for meeting the requirements of section 130.1(c)7.
130.1(c)7A	This change removes high-rise residential buildings and high-rise residential dwellings from the scoping requirements of section 130.1(c)7A.
130.1(d)	This change adds secondary sidelit daylit zones to the mandatory automatic daylighting control requirements. This change also revises the numbering of the exception for parking garage areas, areas with glazing and opening, and retail merchandise sales and wholesale showroom areas.
130.1(d)1	This change specifies that secondary sidelit daylit zones must be shown on the plans.
130.1(d)2	This change clarifies how general lighting in overlapping primary and secondary sidelit daylit zones must be controlled.
130.1(d)3C	This change increases the minimum controlled lighting power reduction from 65 to 90 percent.
130.1(d)3D	This change clarifies that the combination of primary and secondary sidelit daylit zones must be reduced to 100 percent when daylight illuminance is greater than 150 percent of the design illuminance.
130.1(d)4	This change requires that all photosensors be located such that they are not accessible to unauthorized personnel, rather than at least one in a daylit zone.
130.1(d) Exception 3 to 130.1(d)	This change is to rephrase the exception for rooms with total general lighting power in skylit daylit zone and primary sidelit daylit zone of less than 120 watts. This change also exempts rooms with total general lighting power in secondary sidelit daylit zone less than 120 watts from the automatic daylighting control requirements for these zones.
130.1(d), Exception 4 to 130.1(d)	This change relocates the exception for parking garage areas from “Exception 3” to “Exception 4.”
130.1(d), Exception 6 to 130.1(d)	This change removes dedicated ramps in parking garages from being exempted from automatic daylighting control requirements.

Section	Description of Change
130.1(f)9	This change adds new occupant sensing control requirements for space conditioning systems as specified in Table 120.1-A.
130.1, Table 130.1-A	The changes include editorial changes for re-ordering the light source technologies, combine some luminaire types with common characteristics into the same category, move the footnote outside of Table 130.1-A, and to reformat the table for ADA compliance.
130.2, 130.2(b), and Exception 7 to 130.2(b)	The changes to this section remove high-rise residential buildings and high-rise residential dwellings from the scoping requirements of section 130.2 and provide grammatical changes for clarity.
130.2(b), Exception 2 to 130.2(b)	This change exempts outdoor public art lighting from the luminaire shielding requirements.
130.2(b), Exception 6 to 130.2(b)	This change exempts utility-maintained roadways, sidewalks, and bikeways from the luminaire shielding requirements.
130.2(c)2A	This change relocates the automatic scheduling control requirements from the bottom of the subsection to the top.
130.2(c)3A	This change relocates the motion sensing control requirements from the bottom of the subsection to the top.
130.2(c)3Aii	This change adds “wall packs” as the luminaire example for outdoor wall mounted luminaires and to remove the following text: “have a bilaterally symmetric distribution such as Type II, III, and IV light distributions, as described in the IES Lighting Library TM.”
130.4	This change removes high-rise residential buildings and high-rise residential dwellings from the scoping requirements of section 130.4.
130.4(a)	The changes include editing wording to clarify how the lighting control acceptance requirements can be met by testing in accordance with Reference Nonresidential Appendix Section NA7.6 and NA7.8 and change reference to institutional tuning requirement from Section NA7.7 to Section NA7.6.
130.4(a)8 (new)	This change adds demand responsive receptacle controls to the list of controls subject to acceptance testing in nonresidential buildings.
130.4(b)	This change removes the installation certificate requirement for track lighting integral current limiters and track lighting supplementary overcurrent protection panels.
130.5	This change removes high-rise residential buildings and high-rise residential dwellings from the scoping requirements of section 130.5.
130.5(d)	This change revises “occupancy sensing controls” to “occupant sensing controls.”

Section	Description of Change
130.5(e)	This change expressly states that “demand responsive controls and equipment” includes demand responsive controls associated with controlled receptacles.
140.6	This change removes mention of secondary daylit zone provisions, consistent with the relocation of these provisions to mandatory sections.
140.6(a)2	The changes to subsection H, I, and K revise the power adjustment factor (PAF) for daylight dimming plus OFF controls, for occupant sensing controls in office, and for demand responsive control.
140.6(a)3F	This change removes the text “In office buildings with medical and clinical areas and healthcare facilities” from section 140.6(a)3F.
140.6(a)3M	This change removes the requirement for high-rise residential buildings from the nonresidential chapter.
140.6(a)3W	This change adds an exception for horticultural lighting in controlled environment horticulture (CEH) spaces (indoor growing and greenhouses) complying with section 120.6(h).
140.6(a)4B	This change adds the term luminaire aperture to the qualifying luminaire descriptions of small aperture tunable-white and dim-to-warm luminaires lighting power adjustment. The other change revises the lighting power adjustment values for these luminaires.
140.6(c)2Gvii	The change to this section is to delete the specific lighting wattage amount for videoconferencing studio and instead to refer to Table 140.6-C for the lighting power allotment for videoconferencing studio.
140.6(d) (removed)	This change removes the secondary sidelit daylit zone requirements from this section and to move the requirements to section 130.1(d).
140.6, Table 140.6-A	The changes revise Daylight Continuous Dimming plus OFF control to be the type of control qualified for the PAF as specified in Table 140.6-A and revise power adjustment factor values for occupant sensing controls in offices larger than 250 square feet.
140.6, Tables 140.6-B, C, D, and G	The changes amend the indoor lighting power allotments for using complete building method, area category method, and tailored method in Table 140.6-B, Table 140.6-C, Table 140.6-D, and Table 140.6-G. The other changes are to replace the term, “ornamental lighting,” with the term, “decorative lighting” and separate “concourse and atria area” and “convention, conference multipurpose and meeting area” into separate rows.

Section	Description of Change
140.7, Table 140.7-A	The changes revise the lighting power allowance values of general hardscape lighting. The concrete and asphalt surface distinction are removed, and these lighting power allowances are reduced to align with the lighting levels recommendations in the ANSI/IES documents of IES for parking lots and general hardscape lighting applications.
140.7, Table 140.7-B	The changes add a new additional lighting allowance for security cameras. Another change is to update the ornamental lighting 100-watt limit to 50 watts and to correct the reference to section 130.0(c) for luminaire rated wattage determination.
141.0	This change removes reference to high-rise residential (now labeled multifamily buildings), such that the requirements of this section and its subsections now only apply to nonresidential, hotel/motel buildings. Multifamily requirements are being relocated into new sections 160, 170, and 180. A second note has also been added explaining that relocating a relocatable public-school building does not meet the definition of an alteration.
141.0(b)	This change removes multifamily “high-rise residential” from the scope of this requirement.
141.0(b)2I	This change revises the terminology “ornamental lighting” to “decorative lighting” to match the change of the terminology in the new construction section of the code.
141.0(b)2L	The changes clarify application, remove unintended alternate readings, and move the threshold for limited numbers of luminaires into an exception.
141.0(b)2Piv	This change requires that new controlled receptacles as applicable meet demand responsive control requirements.
141.0, Table 141.0-F	The changes to Table 141.0-F clarify applicability by replacing “and” with “or” and update section references consistent with changes made elsewhere in the Energy Code (e.g., moving the demand response provisions to section 110.12). The added language also specifies that the new occupant sensing control requirement added to section 130.1(c)6D are not intended to apply to alterations meeting specified requirements.

Section	Description of Change
160.0 through 180.4	The addition of sections 160.0 through 180.4 is to relocate requirements applicable to multifamily buildings to one area of the Energy Code, and merge requirements where cost-effective and technically feasible. The mandatory requirements for multifamily buildings have been relocated to the newly created Subchapter 10, sections 160.0 through 160.9. The performance and prescriptive requirements for multifamily buildings have been relocated to the newly created Subchapter 11, sections 170.0 through 170.2. The requirements for additions and alterations to multifamily buildings have been relocated to the newly created Subchapter 12, sections 180.0 through 180.4. Most of this relocation is non-substantive, though note that substantive changes proposed for residential and/or nonresidential Energy Code in sections 120 through 150.2 are duplicated here where applicable, for consistency as well as for the reasons stated in the statements for changes made to those sections. Additional substantive changes have been made where feasible to create consistency across the former categories of low-rise and high-rise buildings, i.e., buildings with three or fewer habitable / residential stories and those with four or more (respectively). Specific changes requiring additional detail are described below.
160.5(b)	This new section contains the mandatory lighting requirements for common use areas in multifamily buildings. These requirements mostly align with mandatory requirements in sections 130.0 through 130.5 with specific changes for multifamily buildings.
160.5(b), Exception to 160.5(b)	This change adds an Exception to section 160.5(b) for lighting systems installed in common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units. Lighting systems in the specified common use areas may instead comply with lighting requirements for dwelling units.
160.5(b)4A, Exceptions to 160.5(b)4Aii	This change exempts areas where placement of area control poses a health and safety hazard. This exception differs from the corresponding exceptions in section 130.1(a)1. References to nonresidential function areas have been removed.
160.5(b)4B, Exceptions to 160.5(b)4B	This change exempts restrooms and spaces with one luminaire from multilevel requirements. The exception differs from the corresponding exceptions in section 130.1(b). References to classrooms and healthcare facilities have been removed.
160.5(b)4Cii	This section differs from corresponding nonresidential section 130.1(c)2. Provisions for countdown timer switches to be used in server aisles in server rooms have been removed.

Section	Description of Change
160.5(b)4Ciii	This section differs from corresponding nonresidential section 130.1(c)3B. The exception that applies to nonresidential building spaces has been removed.
160.5(b)4Civ	This section differs from corresponding nonresidential section 130.1(c)4. The exception that applies to nonresidential building spaces has been removed.
160.5(b)4Cv	This section differs from corresponding nonresidential section 130.1(c)5. References to classrooms have been removed.
160.5(b)4Cvi	This section differs from corresponding nonresidential section 130.1(c)6. References to aisle ways and open areas in warehouses and library book stack aisles have been removed.
160.5(b)4Cvii	This section differs from corresponding nonresidential section 130.1(c)7. References to stairwells and common area corridors have been removed. Stairwells and corridors in multifamily common use areas comply with section 160.5(b)4Cvi.
160.5(c)1, Exception 7 to 160.5(c)1	This change adds an exception for outdoor lighting attached to a multifamily building that is separately controlled from the inside of a dwelling unit.
160.5(c)2Ci	This change requires motion sensors for wall mounted general hardscape parking lot lighting located within 1 mounting height of a parking space and 24 feet above grade or lower.
160.5(e)	This new section contains the mandatory lighting controls acceptance testing requirements for common use areas in multifamily buildings.
160.5(e)1H	This change adds demand responsive receptacle controls to the list of controls subject to acceptance testing in multifamily common use areas. Identical language was added to section 130.4 for nonresidential buildings.
160.5(e)2E	This change removes certification requirements for the additional lighting wattage for videoconference studios.
160.5(e)3	This change specifies that a certified lighting controls ATT must perform acceptance testing specified by section 160.5(e) for multifamily common areas.
160.6(d)	This section differs from nonresidential 130.5(d). References to hotel and motel guest rooms have been removed.
160.6(d), Exception 2 to 160.6(d)	This change adds Exception 2 to section 160.6(d) – for receptacles in common use areas providing shared provisions for dwelling units. This change permits receptacles in the specified common use areas to instead comply with receptacles requirements for dwelling units.
160.6(e)	This addition references the demand responsive controlled receptacles requirements in section 110.12(e) that apply to multifamily common use areas.

Section	Description of Change
170.2(e)	This change relocates the prescriptive lighting requirements for common use areas in multifamily buildings to this section. These requirements mostly align with prescriptive requirements in sections 140.6 to 140.8 with specific changes for multifamily buildings.
170.2(e), Exception to 170.2(e)	This change adds an Exception to section 170.2(e) for lighting systems installed in common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units. Lighting systems in the specified common use areas may instead comply with lighting requirements for dwelling units.
170.2(e)2C	This section differs from corresponding nonresidential section 140.6(a)3. References to nonresidential spaces that must comply with the section have been removed.
170.2(e)3	This section differs from corresponding nonresidential section 140.6(b). Multifamily common use areas may only use the area category method or tailored method (and not the complete building method) for calculating allowed indoor lighting power.
170.2(e)6A, Exceptions to 170.2(e)6A	The exception to this section differs from corresponding exception in section 140.7(a). References to nonresidential outdoor lighting applications have been removed.
170.2(e), Tables 170.2-M, N, O	These tables differ from corresponding nonresidential Tables 140.6-C, D, and E. Many space types and lighting power density values have been revised specifically for multifamily common use areas.
170.2(e), Tables 170.2-R, S	These tables differ from corresponding nonresidential Tables 140.7-A and B. Many space types and lighting power density values have been revised specifically for multifamily buildings.
180.2(b)4	This change relocates the prescriptive lighting and electrical power distribution alteration requirements for common use areas in multifamily buildings to this section. These requirements mostly align with prescriptive alteration requirements in sections 141.0(b)2I, 141.0(b)2L, 141.0(b)2M, and 141.0(b)2P with specific changes for multifamily buildings.
NA7.6.1	The changes to this section and subsections include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.1.
NA7.6.1.1	This change revises the construction inspection to directly incorporate specific requirements found in the Energy Code, replacing general language, and avoiding the need to interpret vague, nonspecific language.
NA7.6.1.2	This change revises the protocols to NA7.6.1.4 and NA7.6.1.5 in Section NA7.6.1.2. These changes are reasonably necessary to clarify the protocols to be used for the functional testing of Section NA7.6.1.2.

Section	Description of Change
NA7.6.1.3	This change adds the term “Reserved” for the section to indicate that the section has been removed.
NA7.6.1.4(b)	This change removes the requirement “For lighting system with institutional tuning of NA7.6.4, include documentation for luminaires claiming the PAF for institutional tuning” from item 2.
NA7.6.1.4(c)	This change revises the controlled lighting power reduction to 90 percent consistent with changes to sections 130.1(d) and 160.5(b)4D and specifies 100 percent power reduction for parking garages. Changes for item 4 include replacing “complaint” with “compliant” and revising “daylight dimming” to “daylight continuous dimming.”
NA7.6.1.4(e)	This addition specifies a new alternative partial daylight testing procedure.
NA7.6.1.6	The changes to this section include removing unneeded parenthetical text where it occurs in this section’s subsections, remove reference to continuous dimming for consistency with the section’s title and contents (stepped dimming), remove procedure for documenting daylight dimming plus off behavior, and remove unneeded reference to documenting of institutional tuning (documentation requirements relating to institutional tuning are already specified in the section on institutional tuning).
NA7.6.1.6(c)	The changes include revising the controlled lighting power reduction to 90 percent consistent with changes to sections 130.1(d) and 160.5(b)4D and specifies 100 percent power reduction in parking garages, replacing “(Light output is stable with no visible flicker.)” with “RESERVED” in item 2, and deleting item 4 since the PAF now requires a continuous dimming system to qualify for the PAF.
NA7.6.2	The changes to this section and subsections include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.2.
NA7.6.2.1	This change revises the construction inspection to remove items that are verified during functional testing and revise item c so that the inspection verifies controls are installed per manufacturer instructions.
NA7.6.2.3	This change adds explicit requirements for each type of occupant sensing control including partial on, partial off, and vacancy sensing controls. This change also adds explicit requirements for occupant sensing controls in parking garages, parking areas, and loading and unloading areas.
NA7.6.2.4	This addition specifies new functional testing procedures for multizone occupant sensing controls consistent with new requirements in sections 130.1(c)6D and 160.5(b)4Cvib.

Section	Description of Change
NA7.6.3	The changes revise language to match section 110.12 more closely. Other changes to this section and subsections include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.3.
NA7.6.3.1	This change revises the construction inspection to directly incorporate specific requirements found in Energy Code section 110.12 that can be verified through visual inspections before functional testing.
NA7.6.3.2.3	This addition specifies a new demand responsive control testing procedure using full facility current measurements.
NA7.6.4	This change relocates the institutional tuning power adjustment factor acceptance testing procedures from NA7.7 to NA7.6.
NA7.6.5	This addition specifies new demand responsive controlled receptacle testing procedures consistent with new requirements in sections 110.12(e), 130.4(a)8, and 160.5(e)1H.
NA7.8	The changes to this section and subsections include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.8.
NA7.8.1	The changes to this section consolidate motion sensing controls testing procedures to NA7.8.1, eliminating redundancy with motion sensing control testing procedures in NA7.8.7 and NA7.8.8 (removed).
NA7.8.2	This change adds sampling provisions for functional testing of photosensors.
NA7.8.5 (was NA7.8.7 and NA7.8.8)	This change relocates the automatic scheduling control construction inspection and functional testing procedures from NA7.8.7 and NA7.8.8 to NA7.8.5 (NA7.8.5.1 and NA7.8.5.2). Other changes include removing testing procedures for automatic scheduling controls used in conjunction with motion sensing controls. Motion sensing control testing procedures have been consolidated to NA7.8.1.
NA7.8.5, NA7.8.6 (removed)	The changes to these sections remove the testing procedures for astronomical time switch controls which are redundant with the testing procedures for automatic scheduling controls.

All of the certificate of acceptance for lighting controls installations (NRCA-LTI and NRCA-LTO compliance documents) were updated to Americans with Disabilities Act requirements for accessibility. This includes removing all merged cells and standardizing table formatting and numbering. In addition to those changes the following forms have been modified to demonstrate compliance with the 2022 Energy Code requirements.

Table 3: 2022 Acceptance Test Compliance Document Changes

Lighting Certificate of Acceptance Document	Summary of Modifications
NRCA-LTI-02-A	• Updated the automatic time switch construction inspection and functional testing sections to reflect changes to NA7.6.2.5 and NA7.6.2.6 which include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.2. • Updated the occupant sensing lighting controls construction inspection and functional testing sections to reflect changes in NA7.6.2.1 and NA7.6.2.3 which include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.2. • Added functional testing procedures for multi-zone occupant sensing controls to reflect new requirements in NA7.6.2.4.
NRCA-LTI-03-A	• Updated the construction inspection and functional testing sections to reflect changes to NA7.6.1 which include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.1. • Added alternative partial daylight test for continuous dimming systems to reflect expanded requirements in NA7.6.1.4(e). • Removed functional testing procedure for daylight dimming plus off controls for stepped switching or stepped dimming control systems.

Lighting Certificate of Acceptance Document	Summary of Modifications
NRCA-LTI-04-A	• Updated the construction inspection and functional testing sections to reflect changes to NA7.6.3 which include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.6.3. • Added a third functional testing method for full facility current measurements to reflect expanded requirements in NA7.6.3.2.3. • Added construction inspection and functional testing sections for demand responsive controlled receptacles to reflect expanded requirements in NA7.6.5, sections 110.12(e), 130.4(a)8, and 160.5(e)1H.
NRCA-LTI-05-A	• Updated references to NA7.6.4 to reflect the relocation of institutional tuning acceptance testing from NA7.7.5.2 to NA7.6.4. • Updated the construction inspection to reflect changes to NA7.6.4.1.
NRCA-LTO-02-A	• Updated the construction inspection and functional testing sections to reflect changes to NA7.8 which include clean-up to address minor issues with the grammar, punctuation, structure, consistency, and wording of the procedures in NA7.8. • Added photocontrol sampling procedure to reflect updates to NA7.8.2.2. • Updated the form to include a separate motion sensing control section and automatic scheduling control section. The automatic scheduling control used in conjunction with motion sensing controls section has been removed to reflect updates to NA7.8.1 and NA7.8.5.