DOCKETED	
Docket Number:	13-ATTCP-01
Project Title:	Acceptance and Training Certification
TN #:	238161
Document Title:	ATTCP Quick Start Presentation ADA
Description:	***This document supersedes TN 238159***
Filer:	Joe Loyer
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/9/2021 9:47:06 AM
Docketed Date:	6/9/2021

Acceptance Testing Enforcement

Lighting Controls and Mechanical Systems in Nonresidential Buildings

Presenter: Joe Loyer, Senior Mechanical Engineer
Date: TBD

Agenda

- Introduction
- Acceptance Testing and the ATTCP
- Builders and Contractors
- Authorities Having Jurisdiction
- Questions and Answers

Acronyms Used

ATTCP	Acceptance Test Technician Certification Provider
ATT	Acceptance Test Technician
ATE	Acceptance Test Employer
AHJ	Authority Having Jurisdiction
CEC	California Energy Commission
NRCC	Nonresidential Certificate of Compliance
NRCI	Nonresidential Certificate of Installation
NRCA	Nonresidential Certificate of Acceptance

Introduction

Learning Goals

Understand the ATTCP Program

Builders and contractors

- ATTCP program to demonstrate code compliance
- Secure an ATT certification
- Engineer or architect can rely on program

Authorities Having Jurisdiction

- ATTCP program to enforce Energy Code
- Inspectors can rely on efficacy of program
- Other checks for inspectors to use

ATTCP Program

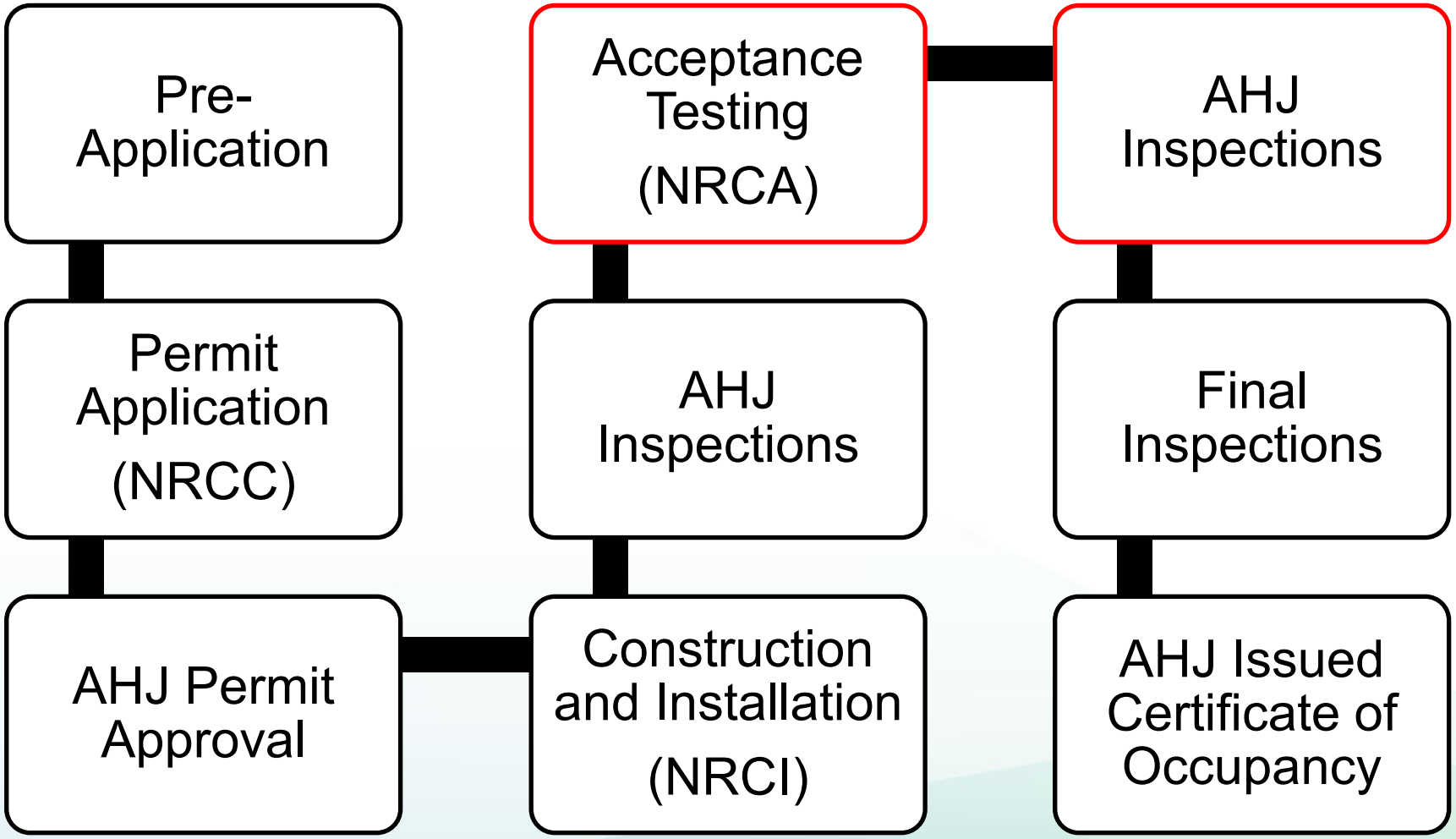
CEC approves ATTCPs to

- Train, certify, and oversee ATTs and ATEs

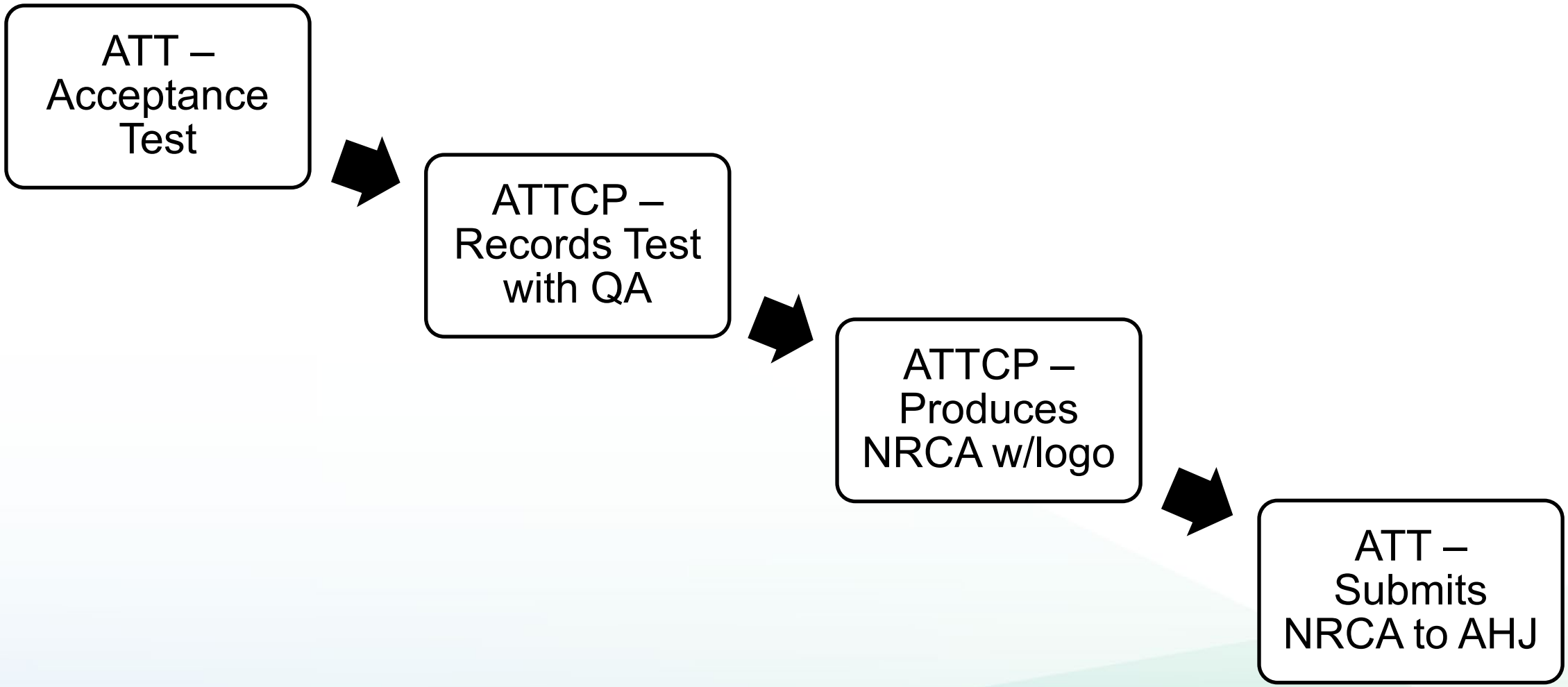
ATTs perform tests in nonresidential buildings for

- Lighting Controls
- Mechanical Systems

Construction Process Overview



Enforcing Acceptance Testing



ATT Certification Enforcement Dates

- Lighting Control: July 2014
- Mechanical Systems: October 1, 2021

Acceptance Testing and the ATTCP

Acceptance Testing

- Final stage of equipment installation
- Construction inspection and functional testing
- Goal: design compliance, functional design, code compliance
- Performed and documented by installing technician
- Submitted to AHJ

ATTCP Program Background

- Established in the 2013 Energy Code
- Improve compliance for lighting controls and mechanical systems
- Private organizations approved by CEC
- Train, certify, provide oversight for ATTs / ATEs
- Tracking system for compliance forms

ATTCP Responsibilities

- Train and certify ATTs and ATEs
- Quality Assurance Program
- Complaints Process
- Generate NRCA Compliance Documents

Lighting Controls ATTCPs

Approved by CEC

- National Lighting Contractors Association of America (NLCAA)
- California Advanced Lighting Controls Training Program (CALCTP)

Mechanical Systems ATTCPs

Approved by CEC

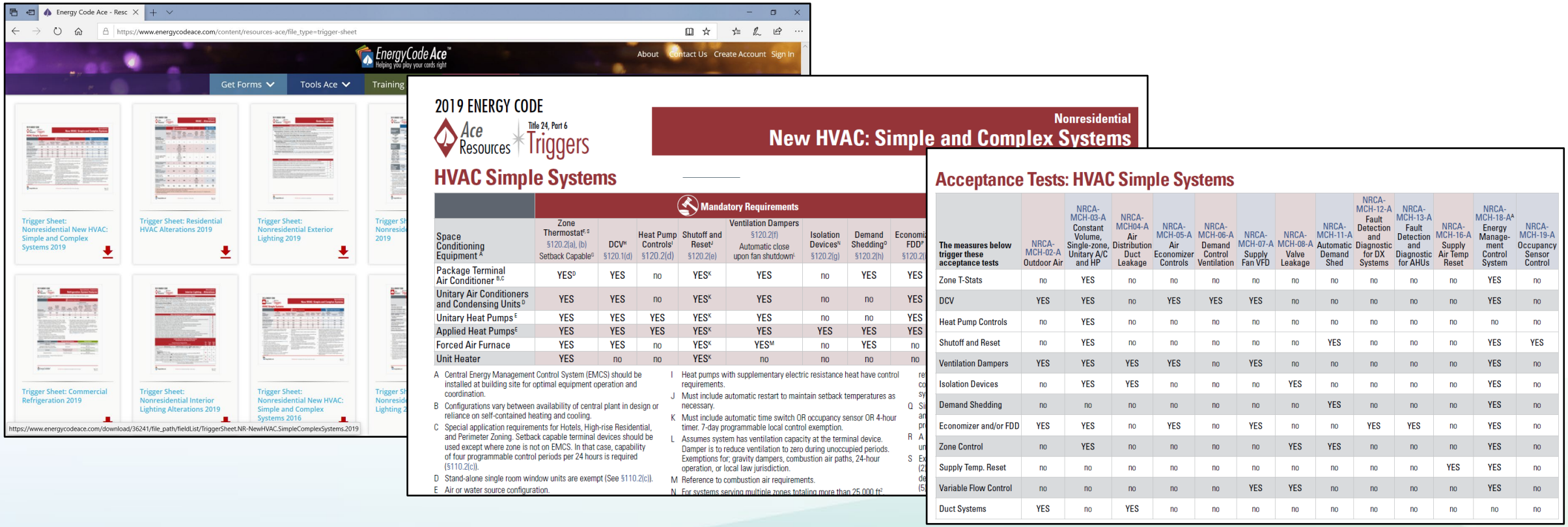
- California State Pipe Trades Council (CSPTC)
- National Energy Management Institute Committee (NEMIC)
- National Environmental Balancing Bureau (NEBB)
- Refrigeration Service Engineers Society (RSES)

Builders and Contractors

Triggers for Acceptance Testing

New installation, addition, alteration

Newly constructed building or tenant improvement



General Acceptance Testing Triggers

- Newly installed lighting controls
  - Indoor
  - Outdoor
- Mechanical systems
  - Newly installed
  - Replacement

Alterations
Indoor Lighting Controls

Acceptance Testing Triggers

- Lighting system installed for first time
- 10% or more of luminaires are altered

Exceptions

- New controls are for 20 or fewer luminaires
- Adding lighting controls only
- Only replacing lamps, ballasts, drivers
- One-for-one luminaire alteration limit 50 per year

Alterations
Outdoor Lighting Controls

Acceptance Testing Triggers

- Systems listed in Table 140.7-A or 140.7-B.

Exception

- Controls for 20 or fewer luminaires

TABLE 140.7-A GENERAL HARDSCAPE LIGHTING POWER ALLOWANCE

Type of Power Allowance	Lighting Zone 0[3]	Lighting Zone 1[3]	
	Asphalt/Concrete	Asphalt/Concrete	
Area Wattage Allowance (AWA)	No allowance[1]	0.018 W/ft²	0.0
Linear Wattage Allowance (LWA)		0.15 W/lf	0
Initial Wattage Allowance (IWA)		180 W	

[1]Continuous lighting is explicitly prohibited in Lighting Zone 0. A parking area, trail head, fee payment kiosk, outhouse, or toilet facil Luminaires installed shall meet the maximum zonal lumen limits a

[2]Where greater than 50% of the paved surface of a parking lot is fir not include any other General Hardscape areas.

[3]Narrow band spectrum light sources with a dominant peak wavele to minimize the impact on local, active professional astronomy or r power allowance multiplier.

TABLE 140.7-B ADDITIONAL LIGHTING POWER ALLOWANCE FOR SPECIFIC APPLICATIONS
All area and distance measurements in plan view unless otherwise noted.

Lighting Application	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
WATTAGE ALLOWANCE PER APPLICATION. Use all that apply as appropriate.					
Building Entrances or Exits. Allowance per door. Luminaires qualifying for this allowance shall be within 20 feet of the door.	Not applicable	9 watts	15 watts	19 watts	21 watts
Primary Entrances to Senior Care Facilities, Police Stations, Healthcare Facilities, Fire Stations, and Emergency Vehicle Facilities. Allowance per primary entrance(s) only. Primary entrances shall provide access for the general public and shall not be used exclusively for staff or service personnel. This allowance shall be in addition to the building entrance or exit allowance above. Luminaires qualifying for this allowance shall be within 100 feet of the primary entrance.	Not applicable	20 watts	40 watts	57 watts	60 watts
Drive Up Windows. Allowance per customer service location. Luminaires qualifying for this allowance shall be within 2 mounting heights of the sill of the window.	Not applicable	16 watts	30 watts	50 watts	75 watts
Vehicle Service Station Uncovered Fuel Dispenser. Allowance per					

Alterations
Mechanical Systems - HVAC

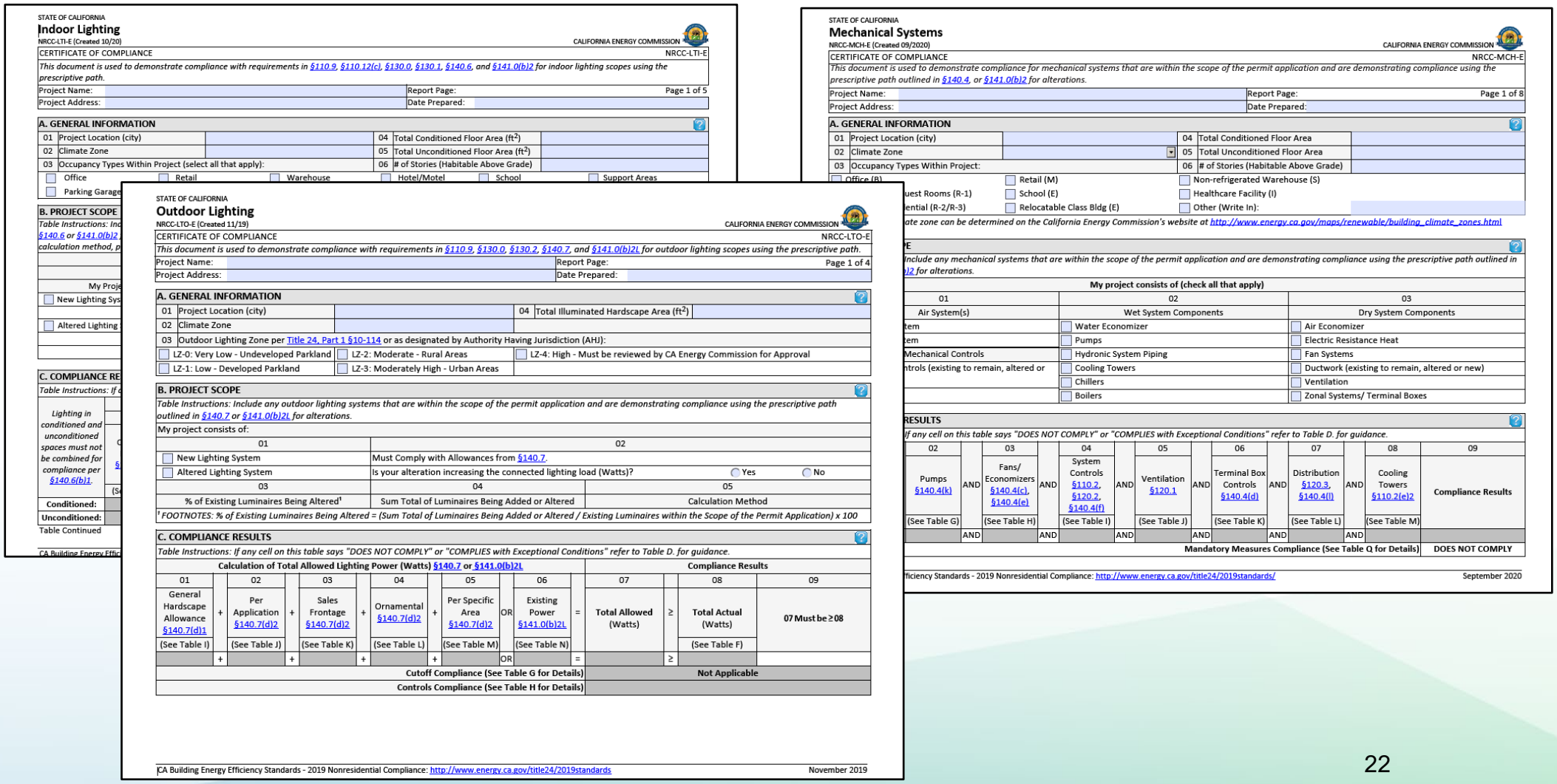
Acceptance Testing Triggers

- Any new or replacement systems or components

Exception

- Electric resistance space heaters for apartments

NRCCs for Lighting Controls and Mechanical Systems



STATE OF CALIFORNIA

Indoor Lighting

NRCC-LTI-E (Created 10/20)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTI-E

This document is used to demonstrate compliance with requirements in §110.9, §110.12(c), §130.0, §130.1, §140.6, and §141.0(b)2 for indoor lighting scopes using the prescriptive path.

Project Name: Report Page: Page 1 of 5

Project Address: Date Prepared:

A. GENERAL INFORMATION

01	Project Location (city)		04	Total Conditioned Floor Area (ft²)	
02	Climate Zone		05	Total Unconditioned Floor Area (ft²)	
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	

☐ Office ☐ Retail ☐ Warehouse ☐ Hotel/Motel ☐ School ☐ Support Areas

☐ Parking Garage

B. PROJECT SCOPE

Table Instructions: Inc §140.6 or §141.0(b)2 calculation method, p

My Proje

☐ New Lighting Sys

☐ Altered Lighting

C. COMPLIANCE RE

Table Instructions: If

Lighting in conditioned and unconditioned spaces must not be combined for compliance per §140.6(b)1.

Conditioned:	
Unconditioned:	

Table Continued

CA Building Energy Effic

STATE OF CALIFORNIA

Outdoor Lighting

NRCC-LTO-E (Created 11/19)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E

This document is used to demonstrate compliance with requirements in §110.9, §130.0, §130.2, §140.7, and §141.0(b)2L for outdoor lighting scopes using the prescriptive path.

Project Name: Report Page: Page 1 of 4

Project Address: Date Prepared:

A. GENERAL INFORMATION

01	Project Location (city)	04	Total Illuminated Hardscape Area (ft²)
02	Climate Zone		
03	Outdoor Lighting Zone per Title 24, Part 1 §10-114 or as designated by Authority Having Jurisdiction (AHJ):		

☐ LZ-0: Very Low - Undeveloped Parkland ☐ LZ-2: Moderate - Rural Areas ☐ LZ-4: High - Must be reviewed by CA Energy Commission for Approval

☐ LZ-1: Low - Developed Parkland ☐ LZ-3: Moderately High - Urban Areas

B. PROJECT SCOPE

Table Instructions: Include any outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.7 or §141.0(b)2L for alterations.

My project consists of:

01	02
☐ New Lighting System	Must Comply with Allowances from §140.7.
☐ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)? ◯ Yes ◯ No

03	04	05
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method

[1] *FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100*

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.

Calculation of Total Allowed Lighting Power (Watts) §140.7 or §141.0(b)2L												Compliance Results			
01		02		03		04		05		06		07		08	09
General Hardscape Allowance §140.7(d)1	+	Per Application §140.7(d)2	+	Sales Frontage §140.7(d)2	+	Ornamental §140.7(d)2	+	Per Specific Area §140.7(d)2	OR	Existing Power §141.0(b)2L	=	**Total Allowed** (Watts)	≥	**Total Actual** (Watts)	**07 Must be ≥ 08**
(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)		(See Table N)				(See Table F)	
	+		+		+		+		OR		=		≥		
Cutoff Compliance (See Table G for Details)												**Not Applicable**			
Controls Compliance (See Table H for Details)															

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards November 2019

STATE OF CALIFORNIA

Mechanical Systems

NRCC-MCH-E (Created 09/2020)

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-MCH-E

This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

Project Name: Report Page: Page 1 of 8

Project Address: Date Prepared:

A. GENERAL INFORMATION

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

☐ Office (B) ☐ Retail (M) ☐ Non-refrigerated Warehouse (S)

☐ uest Rooms (R-1) ☐ School (E) ☐ Healthcare Facility (I)

☐ ential (R-2/R-3) ☐ Relocatable Class Bldg (E) ☐ Other (Write In):

ate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maps/renewable/building_climate_zones.html

E

Include any mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §2 for alterations.

My project consists of (check all that apply)		
01	02	03
Air System(s)	Wet System Components	Dry System Components
tem	☐ Water Economizer	☐ Air Economizer
em	☐ Pumps	☐ Electric Resistance Heat
Mechanical Controls	☐ Hydronic System Piping	☐ Fan Systems
ntrols (existing to remain, altered or	☐ Cooling Towers	☐ Ductwork (existing to remain, altered or new)
	☐ Chillers	☐ Ventilation
	☐ Boilers	☐ Zonal Systems/ Terminal Boxes

RESULTS

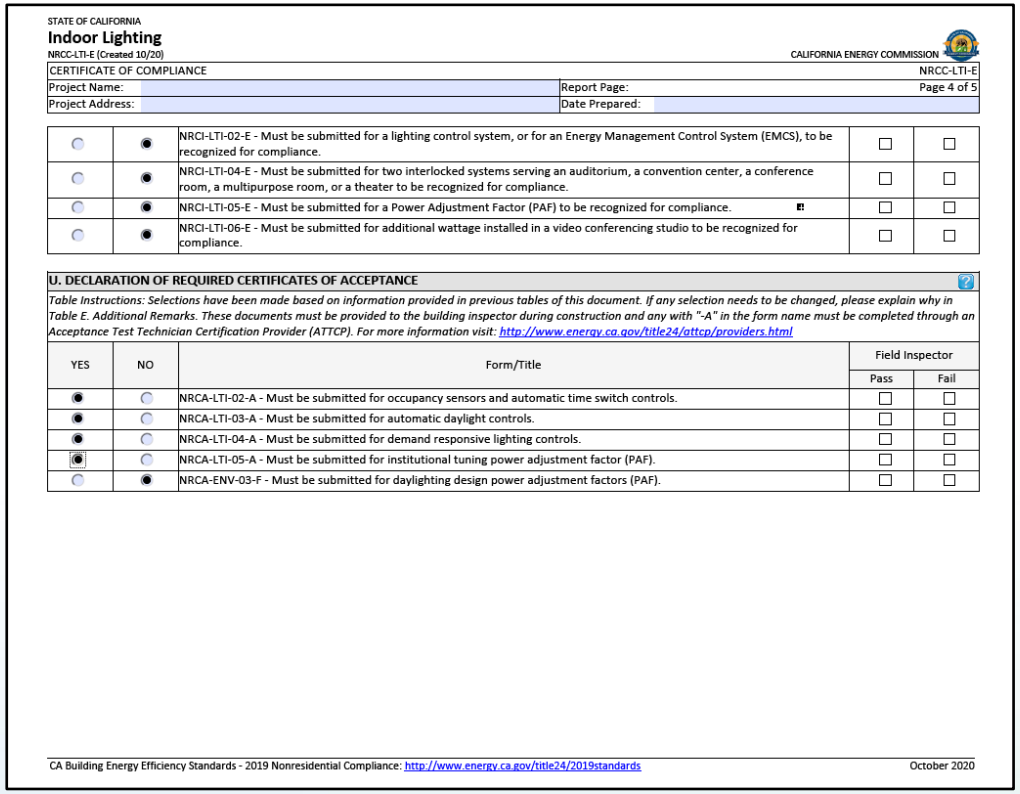
If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

02		03		04		05		06		07		08	09
Pumps §140.4(k)	AND	Fans/ Economizers §140.4(c), §140.4(e)	AND	System Controls §110.2, §120.2, §140.4(f)	AND	Ventilation §120.1	AND	Terminal Box Controls §140.4(d)	AND	Distribution §120.3, §140.4(l)	AND	Cooling Towers §110.2(e)2	**Compliance Results**
(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
	AND		AND		AND		AND		AND		AND		
												Mandatory Measures Compliance (See Table Q for Details)	**DOES NOT COMPLY**

ficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards/ September 2020

NRCC - Acceptance Tests Tables

Indoor Lighting - NRCC
Acceptance Test Requirement Table



STATE OF CALIFORNIA
Indoor Lighting
NRCC-LTI-E (Created 10/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name:	Report Page:	Page 4 of 5
Project Address:	Date Prepared:	

○	●	NRCI-LTI-02-E - Must be submitted for a lighting control system, or for an Energy Management Control System (EMCS), to be recognized for compliance.	☐	☐
○	●	NRCI-LTI-04-E - Must be submitted for two interlocked systems serving an auditorium, a convention center, a conference room, a multipurpose room, or a theater to be recognized for compliance.	☐	☐
○	●	NRCI-LTI-05-E - Must be submitted for a Power Adjustment Factor (PAF) to be recognized for compliance.	☐	☐
○	●	NRCI-LTI-06-E - Must be submitted for additional wattage installed in a video conferencing studio to be recognized for compliance.	☐	☐

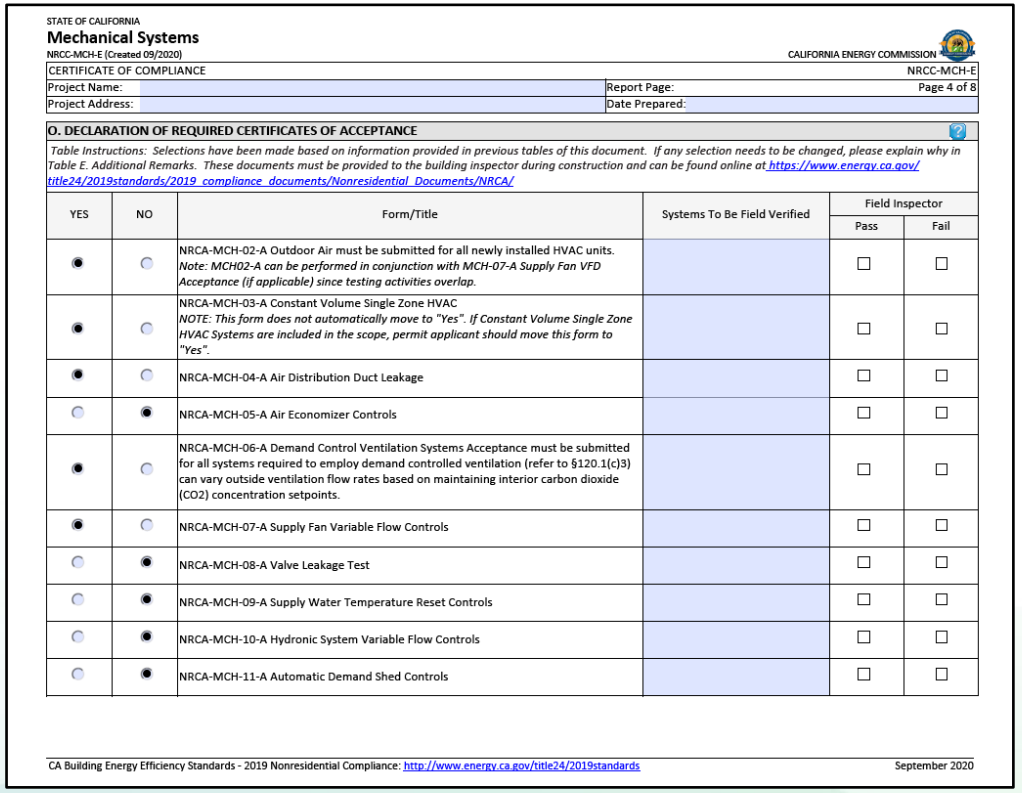
U. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

YES	NO	Form/Title	Field Inspector Pass	Field Inspector Fail
●	○	NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	☐	☐
●	○	NRCA-LTI-03-A - Must be submitted for automatic daylight controls.	☐	☐
●	○	NRCA-LTI-04-A - Must be submitted for demand responsive lighting controls.	☐	☐
●	○	NRCA-LTI-05-A - Must be submitted for institutional tuning power adjustment factor (PAF).	☐	☐
○	●	NRCA-ENV-03-F - Must be submitted for daylighting design power adjustment factors (PAF).	☐	☐

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards October 2020

Mechanical - NRCC
Acceptance Test Requirement Table



STATE OF CALIFORNIA
Mechanical Systems
NRCC-MCH-E (Created 09/2020) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name:	Report Page:	Page 4 of 8
Project Address:	Date Prepared:	

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

YES	NO	Form/Title	Systems To Be Field Verified	Field Inspector Pass	Field Inspector Fail
●	○	NRCA-MCH-02-A Outdoor Air must be submitted for all newly installed HVAC units. *Note: MCH02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.*		☐	☐
●	○	NRCA-MCH-03-A Constant Volume Single Zone HVAC *NOTE: This form does not automatically move to "Yes". If Constant Volume Single Zone HVAC Systems are included in the scope, permit applicant should move this form to "Yes".*		☐	☐
●	○	NRCA-MCH-04-A Air Distribution Duct Leakage		☐	☐
○	●	NRCA-MCH-05-A Air Economizer Controls		☐	☐
●	○	NRCA-MCH-06-A Demand Control Ventilation Systems Acceptance must be submitted for all systems required to employ demand controlled ventilation (refer to §120.1(c)3) can vary outside ventilation flow rates based on maintaining interior carbon dioxide (CO_2) concentration setpoints.		☐	☐
●	○	NRCA-MCH-07-A Supply Fan Variable Flow Controls		☐	☐
○	●	NRCA-MCH-08-A Valve Leakage Test		☐	☐
○	●	NRCA-MCH-09-A Supply Water Temperature Reset Controls		☐	☐
○	●	NRCA-MCH-10-A Hydronic System Variable Flow Controls		☐	☐
○	●	NRCA-MCH-11-A Automatic Demand Shed Controls		☐	☐

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: http://www.energy.ca.gov/title24/2019standards September 2020

AHJ Permit Application Approval

- NRCCs submitted with plan in permit application
- AHJ approves permit application including NRCC

- Total of 10 NRCC forms
  - 2 for lighting controls
  - 1 for mechanical systems

Authorities Having Jurisdiction

AHJ Site Inspection

Enforcement can be simple!

Required

- Reference NRCC to verify required NRCAs
- Verify NRCA submitted has ATTCP logo

Recommended, if Necessary

- Question parts of or entire test
- Take ATTCP Inspector Training
- Ask questions, inspect tools, require demonstration

Lighting Controls ATTCP Logos

National Lighting Contractors Association of America

Mechanical Systems ATTCP Logos

a. NEMIC Logo (Background Watermark on NEMIC Acceptance Forms)

NEMIC
NATIONAL ENERGY MANAGEMENT INSTITUTE COMMITTEE

b. ICB/TABB Logo (Lower Right-Hand Corner on NEMIC Acceptance Forms)

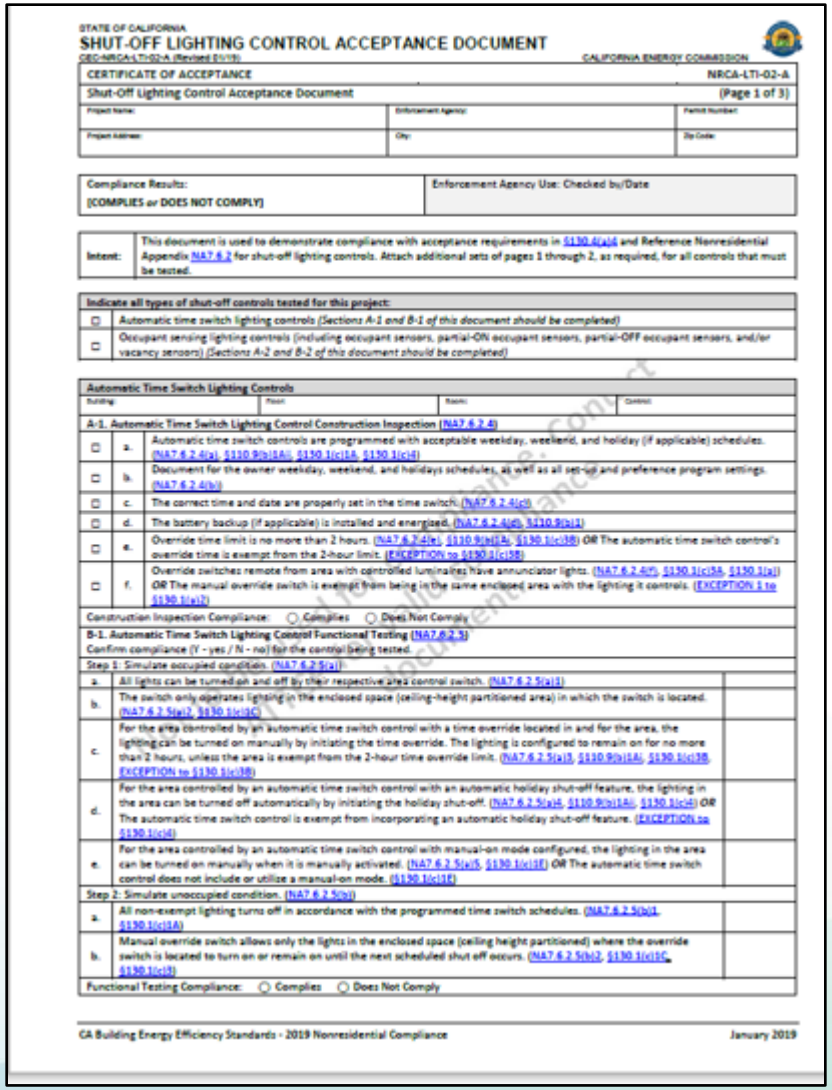
ICB / TABB
INTERNATIONAL CERTIFICATION BOARD
TESTING, ADJUSTING AND BALANCING BUREAU
THE PROFESSIONAL'S CHOICE℠

NEBB

RSES
The HVACR Training Authority

Title 24 Acceptance Test Technician Certification Provider (ATTCP) Program

Invalid NRCAs



STATE OF CALIFORNIA

SHUT-OFF LIGHTING CONTROL ACCEPTANCE DOCUMENT

CEC-NRCA-LTI-02-A (Revised 01/19) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF ACCEPTANCE	NRCA-LTI-02-A
Shut-Off Lighting Control Acceptance Document	(Page 1 of 3)

Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:

Compliance Results: (COMPLIES *or* DOES NOT COMPLY)	Enforcement Agency Use: Checked by/Date

Intent:	This document is used to demonstrate compliance with acceptance requirements in §130.4(a)4 and Reference Nonresidential Appendix NA7.6.2 for shut-off lighting controls. Attach additional sets of pages 1 through 2, as required, for all controls that must be tested.

Indicate all types of shut-off controls tested for this project:	
☐	Automatic time switch lighting controls *(Sections A-1 and B-1 of this document should be completed)*
☐	Occupant sensing lighting controls (including occupant sensors, partial-ON occupant sensors, partial-OFF occupant sensors, and/or vacancy sensors) *(Sections A-2 and B-2 of this document should be completed)*

Automatic Time Switch Lighting Controls

Building:	Floor:	Room:	Control:

A-1. Automatic Time Switch Lighting Control Construction Inspection (NA7.6.2.4)

☐	a.	Automatic time switch controls are programmed with acceptable weekday, weekend, and holiday (if applicable) schedules. (NA7.6.2.4(a), §110.9(b)1A.ii, §130.1(c)1A, §130.1(c)4)
☐	b.	Document for the owner weekday, weekend, and holidays schedules, as well as all set-up and preference program settings. (NA7.6.2.4(b))
☐	c.	The correct time and date are properly set in the time switch. (NA7.6.2.4(c))
☐	d.	The battery backup (if applicable) is installed and energized. (NA7.6.2.4(d), §110.9(b)1)
☐	e.	Override time limit is no more than 2 hours. (NA7.6.2.4(e), §110.9(b)1A, §130.1(c)3B) *OR* The automatic time switch control's override time is exempt from the 2-hour limit. (EXCEPTION to §130.1(c)3B)
☐	f.	Override switches remote from area with controlled luminaires have annunciator lights. (NA7.6.2.4(f), §130.1(c)3A, §130.1(a)) *OR* The manual override switch is exempt from being in the same enclosed area with the lighting it controls. (EXCEPTION 1 to §130.1(a)2)

Construction Inspection Compliance: ○ Complies ○ Does Not Comply

B-1. Automatic Time Switch Lighting Control Functional Testing (NA7.6.2.5)

Confirm compliance (Y - yes / N - no) for the control being tested.

Step 1: Simulate occupied condition. (NA7.6.2.5(a))		
a.	All lights can be turned on and off by their respective area control switch. (NA7.6.2.5(a)1)	
b.	The switch only operates lighting in the enclosed space (ceiling-height partitioned area) in which the switch is located. (NA7.6.2.5(a)2, §130.1(c)3C)	
c.	For the area controlled by an automatic time switch control with a time override located in and for the area, the lighting can be turned on manually by initiating the time override. The lighting is configured to remain on for no more than 2 hours, unless the area is exempt from the 2-hour time override limit. (NA7.6.2.5(a)3, §110.9(b)1A, §130.1(c)3B, EXCEPTION to §130.1(c)3B)	
d.	For the area controlled by an automatic time switch control with an automatic holiday shut-off feature, the lighting in the area can be turned off automatically by initiating the holiday shut-off. (NA7.6.2.5(a)4, §110.9(b)1A.ii, §130.1(c)4) *OR* The automatic time switch control is exempt from incorporating an automatic holiday shut-off feature. (EXCEPTION to §130.1(c)4)	
e.	For the area controlled by an automatic time switch control with manual-on mode configured, the lighting in the area can be turned on manually when it is manually activated. (NA7.6.2.5(a)5, §130.1(c)1E) *OR* The automatic time switch control does not include or utilize a manual-on mode. (§130.1(c)1E)	
Step 2: Simulate unoccupied condition. (NA7.6.2.5(b))		
a.	All non-exempt lighting turns off in accordance with the programmed time switch schedules. (NA7.6.2.5(b)1, §130.1(c)1A)	
b.	Manual override switch allows only the lights in the enclosed space (ceiling height partitioned) where the override switch is located to turn on or remain on until the next scheduled shut off occurs. (NA7.6.2.5(b)2, §130.1(c)1C, §130.1(c)3)	

Functional Testing Compliance: ○ Complies ○ Does Not Comply

Complaint Process

- Available for AHJs and all other parties
- ATTCP complaint processes are CEC-approved
- ATTCPs report complaints to CEC annually
- Complaints can be submitted to CEC directly
- CEC will investigate to achieve resolution

Resources

ATTCP Training:

- National Lighting Contractors Association of America (NLCAA)
- California Advanced Lighting Controls Training Program (CALCTP)
- California State Pipe Trades Council (CSPTC)
- National Energy Management Institute Committee (NEMIC)
- National Environmental Balancing Bureau (NEBB)
- Refrigeration Service Engineers Society (RSES)

California Energy Commission:

- Acceptance Test Technician Certification Provider Program
- Online Resources Center

Energy Code Ace: Web-Link

Staff Contact: Joe Loyer at Joe.Loyer@energy.ca.gov

Questions & Answers

Thank You!