LIGHTING CONTROLS ACCEPTANCE TESTING

As required under the 2016 Building Energy Efficiency Standards

Under the 2016 Building Energy Efficiency Standards, the compliance process for nonresidential buildings includes acceptance tests for lighting control systems. Tests must be conducted by a certified Acceptance Test Technician. Acceptance testing consists of visual inspection and functional performance tests of installed equipment, systems and controls. It was created to help increase code compliance by ensuring that lighting control systems are installed and operating correctly. Acceptance testing will identify any problems with the installation so that they can be corrected before the certificate of occupancy is issued. A properly functioning system saves energy, and ensures that building owners and tenants realize the full benefits of an optimized lighting control system.

WHAT'S NEW IN THE 2016 ENERGY STANDARDS

UPDATED POWER ADJUSTMENT FACTORS

Institutional tuning controls now qualify for a power adjustment factor (PAF) per **Section 140.6**. Acceptance testing requirements have been added to verify that these controls are installed and operating for projects claiming this PAF.

Daylight dimming plus OFF now also qualifies for a PAF. Daylight dimming plus OFF is a control strategy that turns off the lighting in daylit zones when the combined illuminance is greater than 150% of the design illuminance. This strategy provides greater energy savings than minimum daylighting requirements contained in **Section 130.1**.

OUTDOOR ACCEPTANCE TESTING

In the 2016 Energy Standards, there is a change in procedures for outdoor lighting control acceptance tests. Outdoor lighting controls and equipment previously had a limited set of functional tests as part of the acceptance test process. Now all types of outdoor controls must undergo functional testing in addition to inspection.

EXEMPTIONS

For lighting alterations, projects where lighting controls are installed to control 20 or fewer luminaires for the entire project are now exempt from testing.

Please watch the CEC video series on Lighting Controls Acceptance Testing offered at the CEC's Online Resource Center: ***http://www.energy.ca.gov/title24/orc/lighting/2016_lighting.html*** *The 2016 Building Energy Efficiency Standards may be found at* ***http://www.energy.ca.gov/title24/2016standards/****.*

GENERAL REQUIREMENTS

Acceptance Test Requirements

Acceptance test requirements are applicable to new construction, additions, and certain alterations to existing buildings. The requirements are triggered when certain indoor and outdoor lighting controls are installed to comply with the Standards.

- Shut-OFF controls complying with **§130.1(c)**
- Automatic daylight controls complying with **§130.1(d)**
- Demand responsive controls complying with **§130.1(e)**
- Institutional tuning controls complying with **§140.6(a)2H**
- Outdoor lighting controls complying with **§130.2**

For newly constructed buildings and additions, testing is required for any size project. For building alterations, acceptance testing is required for projects that add lighting controls that control more than 20 luminaires for the entire project. For newly constructed buildings over 10,000 ft^2, test results must be included in commissioning documents per **§120.8**.

Lighting control acceptance requirements can be found in **§130.4(a)** of the 2016 Energy Standards. Additional information and procedures for conducting lighting controls acceptance tests are found in Reference Nonresidential Appendix NA7.6, 7.7 and 7.8.

COMPLIANCE PROCESS AND DOCUMENTS

Certificate of Compliance

The design team is required to identify systems that require acceptance tests. Certificates of compliance must be completed prior to application for a building permit. They must be incorporated into the building design plans prior to submission to the authority granting the building permit.

The ATT will review the completed certificates of compliance to understand the scope and number of acceptance tests needed on a project. Indoor lighting controls that require acceptance testing must be listed on compliance form NRCC-LTI-02-E. Outdoor lighting controls are listed on form NRCC-LTO-02-E.

Certificate of Installation

The installing contractor identifies all equipment and systems regulated by Title 24, Part 6, and certifies that these items have been installed in compliance with the Energy Standards. Certificates of installation must be posted or made available with the building permit for inspection, and a copy must be provided to the building owner at occupancy.

The ATT ensures that installation certificates are posted or included with the building permit for final inspection.

Certificate of Acceptance

Certificates of acceptance contain the results of all acceptance tests completed for regulated lighting controls. They also include a declarative statement stating the equipment and systems performed as required by the Energy Standards.

Any problems identified during acceptance testing must be fixed and retested prior to final inspection. The Certificates of Acceptance must be posted or made available for inspection, and a copy must be provided to the building owner at occupancy. Certificates of Acceptance include :

- NRCA-LTI-02-A Lighting Controls
- NRCA-LTI-03-A Automatic Daylighting Controls
- NRCA-LTI-04-A Demand Responsive Controls
- NRCA-LTI-05-A Institutional Tuning Controls
- NRCA-LTO-02-A Outdoor Lighting Controls

TRAINING AND CERTIFICATION

To get certified as a lighting controls acceptance test technician, you must complete training from an approved Acceptance Test Technician Certification Provider (ATTCP) recognized by the California Energy Commission. Approved ATTCPs are listed on the Energy Commissions website. **http://www.energy.ca.gov/title24/attcp/.**

After gaining certification, an ATT is authorized to conduct lighting control acceptance tests in California. ATTs must be recertified every time the Standards change, typically on a 3-year cycle. This is to ensure that the ATT receives training and is informed of any changes to the acceptance testing requirements.