

Nonresidential Appendix NA7 – 2008

Appendix NA7-2008 – Acceptance Requirements for Nonresidential Buildings

NA7.1 Purpose and Scope

This appendix defines acceptance procedures that must be completed on certain controls and equipment before the installation is deemed to be in compliance with the Standards. These requirements apply to all newly installed equipment for which there are acceptance requirements in new and existing buildings. The procedures apply to nonresidential, high-rise residential and hotel/motel buildings as defined by the California Energy Commission's Energy Efficiency Standards for Nonresidential Buildings.

The purpose of the acceptance tests is to assure:

1. The presence of equipment or building components according to the specifications in the compliance documents.
2. Installation quality and proper functioning of the controls and equipment to meet the intent of the design and the Standards.

NA7.2 Introduction

Acceptance requirements are defined as implementation of targeted inspection checks and functional and performance testing to determine whether specific building components, equipment, systems, and interfaces between systems conform to the criteria set forth in the Standards and to related construction documents (plans or specifications). Acceptance requirements improve code compliance effectiveness and help meet the expected level of performance.

Prior to signing a Certificate of Acceptance the installing contractor, engineer of record or owners agent shall be responsible for reviewing the plans and specifications to assure they conform to the acceptance requirements. Persons eligible to sign the Certificate of Acceptance are those responsible for its preparation; and licensed in the State of California as a civil engineer, mechanical engineer, licensed architect or a licensed contractor performing the applicable work or a person managing work on a structure or type of work described pursuant to Business and Professions Code sections 5537, 5538, and 6737.1.

NA7.3 Responsible Party

The installing responsible party shall certify compliance with the acceptance requirements. They shall be responsible for performing data analysis, calculation of performance indices, and crosschecking results with the requirements of the Standard. They shall be responsible for issuing a Certificate of Acceptance as well as copies of all measurement and monitoring results for individual test procedures to the enforcement agency. The enforcement agency shall not release a final Certificate of Occupancy until a Certificate of Acceptance, and all applicable acceptance requirements for code compliance forms, are approved and submitted by the responsible party. A responsible party who is licensed shall record their State of California contractor's license number or their State of California professional registration license number on each Certificate of Acceptance that they issue.

- The total daylight and electric lighting illuminance level measured at its reference location just after the stage of control dims or shuts off a stage of lighting:
 1. The total measured illumination shall be no less than the reference illuminance measured at this location during the no daylight test documented in Step 2.
 2. The total measured illumination shall be no greater than 150 percent of the reference illuminance.
- The control stage shall not cycle on and off or cycle between dim and undimmed while daylight illuminance remains constant.
- Only luminaires in daylit zones (toplit zone, primary sidelit zone, and secondary sidelit zone) are affected by daylight control.

Step 5: Verify time delay.

- Verify that time delay automatically resets to normal mode within 60 minutes.
- Set normal mode time delay to at least three minutes.
- Confirm that there is a time delay of at least 3 minutes between the time when illuminance exceeds the setpoint for a given dimming stage and when the control dims or switches off the controlled lights.

NA7.6.2 Occupancy Sensor Acceptance

NA7.6.2.1 Construction Inspection

Prior to Functional testing, verify and document the following:

- Occupancy sensor has been located to minimize false signals:
 - No closer than four (4) feet from a HVAC diffuser.
 - PIR sensor pattern does not enter into adjacent zones.
- Occupancy sensors do not encounter any obstructions that could adversely affect desired performance.
- Ultrasonic occupancy sensors do not emit audible sound.

NA7.6.2.2 Functional testing

For buildings with up to seven (7) occupancy sensors, all occupancy sensors shall be tested. For buildings with more than seven (7) occupancy sensors, sampling may be done on spaces with similar sensors and space geometries. If the first occupancy sensor in the sample group passes the acceptance test, the remaining building spaces in the sample group also pass. If the first occupancy sensor in the sample group fails the acceptance test the rest of the occupancy sensors in that group must be tested. If any tested occupancy sensor fails it shall be repaired, replaced or adjusted until it passes the test.

For each sensor to be tested do the following:

Step 1: For a representative sample of building spaces, simulate an unoccupied condition. Verify and document the following:

- Lights controlled by occupancy sensors turn off within a maximum of 30 minutes from the start of an unoccupied condition per §119(d).
- The occupant sensor does not trigger a false "on" from movement in an area adjacent to the space containing the controlled luminaires or from HVAC operation.
- Signal sensitivity is adequate to achieve desired control.

Step 2: For a representative sample of building spaces, simulate an occupied condition. Verify and document the following:

- Status indicator or annunciator operates correctly.

- Lights controlled by occupancy sensors turn on immediately upon an occupied condition, *OR* sensor indicates space is "occupied" and lights are turned on manually (automatic OFF and manual ON control strategy).

NA7.6.3 Manual Daylighting Controls Acceptance

NA7.6.3.1 Construction Inspection

Prior to Functional testing, verify and document the following:

- If dimming ballasts are specified for light fixtures within the primary sidelit zone or skylit zone, make sure they meet all the Standards requirements, including "reduced flicker operation" for manual dimming control systems.

NA7.6.3.2 Functional testing

Step 1: Perform manual switching control. Verify and document the following:

- Only lights in the primary sidelit zone or the skylit zone as defined in §131(c) are controlled. Compare daylighting controlled luminaires against description of the primary sidelit and skylit zones on the building plans.
- Manual switching or dimming achieves a lighting power reduction of at least 50 percent.
- The amount of light delivered to the space is uniformly reduced.

NA7.6.4 Automatic Time Switch Control Acceptance

NA7.6.4.1 Construction Inspection

Prior to Functional testing, verify and document the following:

- Automatic time switch control is programmed with acceptable weekday, weekend, and holiday (if applicable) schedules.
- Document for the owner automatic time switch programming including weekday, weekend, holiday schedules as well as all set-up and preference program settings.
- Verify the correct time and date is properly set in the time switch.
- Verify the battery back-up (if applicable) is installed and energized.
- Override time limit is set to no more than 2 hours.
- Override switches remote from area with controlled luminaires have annunciator lights.

NA7.6.4.2 Functional testing

Step 1: Simulate occupied condition. Verify and document the following:

- All lights can be turned on and off by their respective area control switch.
- Verify the switch only operates lighting in the enclosed space (ceiling-height partitioned area) in which the switch is located.

Step 2: Simulate unoccupied condition. Verify and document the following:

- All non-exempt lighting turn off per §131(d)1.
- 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.