



**BSR/ASHRAE/IES Addendum cv
to ANSI/ASHRAE/IES Standard 90.1-2016**

Public Review Draft

**Proposed Addendum cv to
Standard 90.1-2016, Energy Standard
for Buildings Except Low-Rise
Residential Buildings**

**First Public Review (May 2019)
(Draft Shows Proposed Changes to Current Standard)**

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FOREWORD

This proposal updates the control requirements for parking garages in Section 9.4.1.2. There are roughly 85 million parking garage spaces in the U.S. and an estimated growth rate of 0.9% per year. When the requirements were originally included in the standard, HID light sources were still a widely used light source for parking garage lighting. HID could not be dimmed more than 30%, so the setback requirements in 9.4.1.2(b) were limited accordingly. With LED light sources, it is possible to increase the stringency of the setback requirement to 50%. The proposal also changes the control time-out from 20 minutes to 10 minutes.

9.4.1.2(c) previously required a 50% setback of lighting in the daylight transition zone during non-daylight hours. This proposal increases the stringency to require reduction to match the general illumination in the parking garage.

In the existing standard, 9.4.1.2(d) requires daylight responsive controls for lighting within 20' of the fenestration, where there is no exterior obstruction within 20'. This proposal modifies 9.4.1.2(d) to align with similar language for sidelighting daylight zones found in 9.4.1.1 (e), Exception 1. This proposal also adds an exemption for perimeter screening of the parking structure.

The proposal is cost-effective.

Baseline Source	New Source	Power Reduction	Time-out Period	Energy Savings
HID	LED	30% → 50%	20 min. to 10 min.	74%
LED	LED	30% → 50%	20 min. to 10 min.	27%

Assumptions:

- Energy: 145,000 sq. ft. parking garage with 446 spaces; 1 fixture every 2.5 spaces; facility 24-hour operation
- Fiscal: device life of 10 years; scalar ratio cooling limit of 8; initial cost of \$50.00, used national average electricity rate and are cost-effective under scalar metric rules

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum cv to 90.1-2016

Modify the standard as follows (IP and SI Units)

9.4.1.2 Parking Garage Lighting Control

Lighting for parking garages shall comply with the following requirements:

- a. Parking garage lighting shall have *automatic* lighting shutoff per Section [9.4.1.1\(i\)](#)
- b. Lighting power of each *luminaire* shall be *automatically* reduced by a minimum of ~~30~~ 50% when there is no activity detected within a lighting zone for ~~20~~ 10 minutes. Lighting zones for this requirement shall be no larger than 3600 ft² (334 m²).
- c. ~~Parking garage daylight transition lighting exempt per Section 9.2.2.3 for covered vehicle entrances and exits from buildings and parking structures,~~ shall be separately controlled ~~to by a device that automatically reduces the lighting to no more than the general light level at night by at least 50% from sunset to sunrise.~~
- d. The power to any luminaires within 20 ft (6.1 m) of ~~any~~ perimeter wall openings totaling at least 24 ft² (2.2 m²) ~~wall structure that has a net opening to wall ratio of at least 40% and no exterior obstructions within 20 ft,~~ shall be *automatically* reduced through continuous dimming in response to available daylight. ~~by at least 50%.~~

Exception to Exceptions to 9.4.1.2(d)

Lighting in the following areas is exempt:

1. ~~Lighting in Parking garage daylight transitions zones and ramps without parking lighting exempt per Section 9.2.2.3.~~
 2. Where permanent screens or architectural elements obstruct more than 50% of the opening.
 3. Where the top of any existing adjacent structure or natural object is at least twice as high above the openings as its horizontal distance from the opening.
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