EE 14: LIMIT AFTER-HOURS RETAIL LIGHTING

New York City Building Code
Proposal developed by the Lighting & Daylighting Committee

Summary

Issue:
Many retail establishments in New York City light their spaces all night long. This wastes energy, especially because stores often use high-wattage fixtures.

Recommendation:
Require retail lighting, other than lighting used in window displays or for egress, to be turned off when stores are unoccupied.

Proposed Legislation, Rule or Study

Amendments to ANSI/ASHRAE/IESNA 90.1 (2007), as incorporated in Chapter 13 of the New York City Building Code:

1. Add a new paragraph (g) to Section 9.4.1.4 as follows:

   9.4.1.4 Additional Control

   g. Retail lighting—retail spaces shall be equipped with one or more automatic control device(s) to turn off all general interior lighting or to reduce the lighting levels to the minimum required by law for egress. Such lighting reduction shall occur within 20 minutes of store closing. Lighting levels shall be programmed to return to desired levels 20 minutes prior to store opening or initiated by occupancy.

   Exceptions:

   1. Lighting used for nighttime marketing and not exceeding an interior lighting power allowance of 50 watts per linear foot of the perimeter display window area until midnight, and 25 watts per linear foot of the perimeter display window area after midnight. No more than 20% of the total allowance shall be used by luminaires located more than 15 feet from display windows. All luminaires used for nighttime marketing shall have a luminous efficacy greater than 30 lumens per watt.

   2. Light fixtures used in spaces containing automatic teller machines.

   3. Zoned lighting controls connected to occupancy sensors or timeclock override switches not exceeding two hours per override that enable cleaning, re-stocking, construction of displays or other activities that occur during off-hours.

   4. Zoned lighting controls connected to occupancy sensors for nightlighting or security lighting.

   5. Temporary seasonal window displays operating no later than midnight or one hour after store closing, whichever is later.

Supporting Information

Issue - Expanded
Many stores remain illuminated all night long, well after closing time. It is always wasteful to light unoccupied spaces and especially so for retail establishments since their lighting consumption can be equivalent many floors of offices. While retailers feel that lighting stores during off-hours provides a marketing advantage, most merchandise cannot be seen beyond ten or fifteen feet from the perimeter windows.

Limiting lighting to display windows and 15 feet of the store interior will enable retailers to display their goods to consumers, while saving energy. Window display lighting is also sufficient to illuminate the street, promoting pedestrian
street activity and a sense of urban security. In addition, retail security does not require illumination the deep interior of stores. In case of unauthorized entry, lights and alarms can be activated through the use of occupancy sensors, cameras, security sensors, alarms, and other low-energy security devices.

Environmental & Health Benefits
Using less lighting will reduce the demand for electricity and thereby lower carbon emissions and improve air quality.

This proposal was found to have a low, positive environmental impact per building and to impact a small number of buildings. It was thus given an environmental score of 1.

This proposal was found to have no significant positive health impact.

Cost & Savings
As described in the Executive Summary, Bovis Lend Lease prepared cost estimates for each Task Force proposal in the context of well-defined construction projects in specific buildings. Where possible, members of the Technical Committees prepared savings estimates for some of these projects and buildings. These cost and savings estimates are presented in the February 1st draft version of Appendix A. The innate uncertainty in how construction and operation will vary from one building to another, the complexity of the Task Force proposals, and the wide range of applications in which the proposals may be realized mean these figures are truly estimates.

This proposal was estimated to increase capital cost by $0.05/square foot. It was thus categorized as not incurring a capital cost increment. This proposal was also estimated to generate financial savings that will pay for the capital costs in less than three years.

Precedents
Automated controls, and separate circuits for decorative and display lighting are already part of existing codes and standards and this proposal would regulate how those controls function. For at least the last seven years, the NYS Energy Conservation Construction Code of 2002 (referencing ASHRAE/IESNA Standard 90.1-1999) has required that all buildings over 5000 square feet be controlled by an automatic control device to shut off lighting in all spaces (this can be a programmed time switch). In addition, each space with full height partitions requires local control of zones (switches or occupancy sensors) that can be between 2500 square feet and 10,000 square feet. The 5000 square foot limit was been removed in Standard 90.1–2007, so all buildings now require automatic shut off regardless of size.

The ASHRAE/IESNA/NBI/DOE Advanced Energy Design Guide for Retail recommends the following, “Put all general, all accent, and all display case lighting on separate circuits and switches (use multiple circuits and switches as required). Use automatic time scheduling time switches to turn on accent and display case lighting no more than 20 minutes prior to normal scheduled hours and to turn off accent and display case lighting no more than 20 minutes after normal scheduled hours”.

LEED
This proposal may assist in compliance with LEED prerequisites for Energy & Atmosphere under most of the rating systems.

These recommendations will also facilitate achieving LEED Energy and Atmosphere credits:
- LEED NC-EA cr.1 Optimize Energy Performance
- LEED EB-EA cr.1 Optimize Energy Performance
- Additional credits under LEED pilot programs.

These credits require exceeding the minimum standards established by the Energy and Atmosphere prerequisites.

Implementation & Market Availability
Devices to turn off lighting are readily available. Wireless controls for existing installations are expected to be commonplace within 2-3 years. Utility or NYSERDA incentives for wireless controls would enable existing retail to comply sooner.