EE 15:
REDUCE ARTIFICIAL LIGHTING IN SUNLIT LOBBIES & HALLWAYS

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

Summary

Issue:
The building code mandates excessive lighting for egress spaces and that they be illuminated by artificial means even when the space is daylit or unoccupied.

Recommendation:
Align NYC egress illumination requirements with national standards and allow natural light to supply the required illumination, while maintaining current NYC standards when spaces are occupied.

Proposed Legislation, Rule or Study

Amendments to the New York City Building Code:

1. Amend Sections 1006.1 and 1006.2 as follows:

   1006.1 Illumination Required. Exits, exit discharges, and public corridors shall be illuminated at all times by either natural light or electrical lighting fixtures. Exit access components shall be illuminated by either natural light or electrical lighting fixtures at all times [during occupancy] that the space served by the exit access component is occupied.

   1006.2 Illumination Level. The means of egress illumination level shall not be less than 2 foot-candles (22 lux) at the floor levels in exits, at exit discharges, and in public corridors[,] when these spaces are occupied, nor less than 1 foot-candle when these spaces are unoccupied, and shall not be less than 1 foot-candle (11 lux) at the floor level in exit access components other than public corridors.

2. Add a new Section 1006.2.1 as follows:

   1006.2.1 Sensors and Controls. Automatic, occupant sensor lighting controls shall be permitted within means of egress, provided that the switch controllers are equipped for fail-safe operation, the illumination times are set for a minimum 15-minute duration, and the occupant sensor is activated by any occupant movement in the area served by the lighting units.

Supporting Information

Issue – Expanded
For obvious safety reasons, the Building Code requires all means of egress to be illuminated. However, the code does not credit daylight as a source of illumination for means of egress. It also requires “exit access components,” such as corridors in offices and aisles in supermarkets, to be fully illuminated even when a space is unoccupied. Moreover, New York City requires twice the illumination as the rest of the nation for means of egress, even in an unoccupied building. These code provisions unnecessarily waste energy without increasing safety.

Since the Building Code does not recognize daylight as illumination in means of egress, buildings cannot use daylight-responsive controls to turn off electric lights when those areas are sunlit. It is common to see new, “green” buildings with daylight-responsive lighting controls where all of the lights in a day lit corridor have been turned off except for the emergency lights, which continue to operate at full output in the midst of streaming sunlight.

Under the code, all exit access components must also remain illuminated whenever any part of a building is occupied. This means that emergency lighting in a locked and vacant supermarket on the ground floor of a 40-storey office building is required to remain on at 2:00 AM if someone is working late on the 23rd floor.

It is wasteful and unnecessary for light fixtures to operate at full output next to a sunny window or to light unoccupied
fire stairs more brightly than the rest of the nation lights occupied fire stairs. This proposal would credit natural light as a source of illumination in means of egress. It would also allow lighting in exit access components to be turned off when an area is unoccupied. Finally, the proposal would permit occupant sensing lighting controls to set back the lighting in means of egress to national standard illumination levels when the space is not occupied. Section 1006.2.1, which describe how these controls would operate, is taken directly from the Life Safety Code of the National Fire Protection Association.

Policy makers may be concerned that lighting controls will malfunction during an emergency and leave fire stairs dark. However, this proposal would maintain lighting in exits, exit discharges, and public corridors 24 hours a day, 365 days a year. Since these spaces are used on a daily basis, any failure of the lighting controls would be as noticeable as a burned out light bulb, and much less likely.

**Environmental & Health Benefits**

This proposal will result in energy savings since lights could be switched off or dimmed when they do not need to be on. It will also reduce peak electricity demand, because peak demand usually occurs in the middle of a sunny summer afternoon, which coincides with peak daylight availability.

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 2.

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

**Cost & Savings**

This proposal is for a code allowance, which will have no direct impact on construction costs.

**Precedents**

Several national and state codes already allow the use of automatic lighting controls in means of egress. The International Building Code (IBC 2006 and 2009), Section 1006.1 Illumination Required, states, "The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied." This means that lights can be switched off when the building space served by the means of egress is unoccupied. This same language is found in Massachusetts State Building Code, which is the building code for the City of Boston.

The National Fire Protection Association’s Life Safety Code (NFPA 101 2009) states that, “Automatic, motion sensor-type lighting switches shall be permitted within means of egress, provided that the switch controllers are equipped for fail-safe operation, the illumination timers are set for a minimum 15-minute duration, and the motion sensor is activated by any occupant movement in the area served by the lighting units”.

A 2001 Code Application Notice issued by California’s Office of Statewide Health Planning and Development amended previous state egress code regarding illumination. It states that “egress illumination is not needed for portions of the building that are not occupied”3 This allows the egress illumination in unoccupied areas to be monitored and determined by actual user need.

The Lighting & Day Lighting Committee is not aware of any codes aside from New York City’s that prohibit the control of lighting in means of egress.

**LEED**

Due to improved energy performance resulting from these measures, 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
- LEED ND-GCT cr.2 Energy Efficiency in Buildings
- LEED for Schools EA cr.1 Optimize Energy Performance
- and credits under LEED pilot programs. These credits require exceeding the minimum standards established by the Energy and Atmosphere prerequisites.

LEED CI-EA cr.1.1 Optimize Energy Performance, Lighting Power, specifically addresses reducing lighting power throughout the entire tenant space. According to the LEED CI 2.0 Reference Manual, for commercial interior projects the reduction of interior lighting power stands to be the greatest energy conservation method available. Therefore, this proposal will have a significant positive impact on LEED certification.

LEED Indoor Environmental Quality subsections regarding daylight illumination, and LEED CI-EA cr.1.2 Daylight response controls, are only applicable to regularly occupied spaces. Therefore, this proposal will not assist in achieving
these credits.

**Implementation & Market Availability**
There are no known implementation issues for this proposal.

Photosensors have been used for decades to turn off exterior emergency lighting at points of exit discharge from buildings. The proposal would allow this same technology to be used inside the building. Occupancy sensors have also been in widespread use for decades, and are extremely good at detecting the “major body motion” of a person walking.

**ENDNOTES:**