EE 7: INCREASE LIGHTING EFFICIENCY IN APARTMENT BUILDINGS

Administrative Code (Housing Maintenance Code)
Proposal developed by the Lighting & Daylighting Committee

Summary

Issue:
The current lighting requirements in the Housing Maintenance Code for hallways, stairs, and common laundry facilities reference an old terminology for lighting: the use of incandescent lights. They also imply that the lights in hallways, stairs, and common laundry facilities should always be fully on.

Recommendation:
Update the language in the code to match other city codes, particularly the energy code. Specify a minimum efficacy for light bulbs, and expressly allow bi-level lighting for hallways and stairs, and occupancy sensors for laundries.

Proposed Legislation, Rule or Study

Amendments to the Administrative Code of the City of New York:

1. Amend Section 27-2038 as follows:

§ 27-2038 Electric lighting fixtures in certain public parts of dwellings; fixtures and lights required.
a. In every multiple dwelling and tenant-occupied two-family dwelling, the owner shall provide electric lighting fixtures for every public hall, stair, fire stair and fire tower on every floor, in accordance with the following requirements:

[(1) If an incandescent lighting fixture is provided, it shall be capable of providing illumination of at least ten watts per twenty-five square feet of floor area or fraction thereof. Each lighting fixture shall be provided with one or more lights of a total of not less than sixty watts. Where, under this requirement, the number of watts per fixture would exceed one hundred, one or more additional fixtures shall be provided and shall be located as may be prescribed by the department, except where the distance from the fixture to the farthest intersecting wall does not exceed twenty feet.

(2) If a fluorescent lighting fixture is provided, it shall be capable of providing illumination of at least four watts cool white fluorescent light per twenty-five square feet of floor area or fraction thereof. Each lighting fixture shall be provided with one or more lights of a total of not less than twenty watts. Where, under this requirement, the number of watts per fixture would exceed forty, one or more additional fixtures shall be provided and shall be located as may be prescribed by the department, except where the distance from the fixture to the farthest intersecting wall does not exceed twenty feet.]

(1) Lighting fixtures shall be capable of providing an average illumination level no less than of five foot-candles measured at the floor in hallways, and no less than seven and one half foot-candles measured at the floor in stairs. The lighting fixtures shall be capable of providing minimum illumination levels that are not less than ten percent of the required average levels, measured at floor level no closer than six inches from the wall, and maximum-to-minimum illumination uniformity ratio that does not exceed twenty to one. The minimum luminous efficacy of all light bulbs (lamps) shall be fifty lumens per watt.

[(3)] (2) In every multiple dwelling hereafter erected, in addition to other lighting requirements, a sufficient number of [incandescent or fluorescent] electrical lighting fixtures shall be provided so that the distance between fixtures is not more than thirty feet and so that no wall is more than fifteen feet distant from a fixture.

(3) Automatic, occupant sensor lighting controls shall be permitted provided that the switch controllers are equipped for fail-safe operation ensuring that if the sensor or control fail the lighting levels will be at the levels required when the space is occupied, 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.

[b. The department may approve electric lighting for public halls, stairs, fire stairs and fire towers other than the incandescent and fluorescent lighting required in subdivision a of this section if such other method of electric lighting provides equivalent illumination, and meets the requirements of the electrical code.]
c.) b. Notwithstanding any other requirement of this section, the department may require fixtures to be so located, and additional fixtures to be installed, in order to assure that every part of every public hall, stair, fire stair or fire tower is adequately lighted.

2. Amend paragraphs a, b and c of Section 27-2039 as follows:

§ 27-2039 [Lighting] Illumination to be provided [at] day and night; owner's responsibility.

a. [The owner of a multiple dwelling shall turn on all required lights in every public hall and stair at sunset every day and shall keep them on until sunrise the day following.] Any occupied public hall, stair, fire stair or fire tower shall be illuminated by either natural light or electrical lighting to an average illumination level no less than five foot-candles in hallways, and seven and one half foot-candles in stairs, measured at floor level. Minimum illumination levels shall not be less than ten percent of the required average levels, measured at floor level no closer than six inches from the wall, and the maximum-to-minimum illumination uniformity ratio shall not exceed twenty to one.

b. [The owner of a multiple dwelling shall keep all required lights burning continuously (1) in every fire stair and fire tower; (2) in every stair and public hall where there is no window opening on a street, court, yard, space above a setback, or on a shaft; and (3) in every stair and public hall where there is a window which in the opinion of the department does not provide adequate natural light.] Any unoccupied public hall, stair, fire stair or fire tower, unoccupied, shall be illuminated by either natural light or electrical lighting to an average illumination level no less than one foot-candle measured at floor level. Minimum illumination levels shall not be less than ten percent of the required average levels, measured at floor level no closer than six inches from the wall, and the maximum-to-minimum illumination uniformity ratio shall not exceed twenty to one.

c. [The owner of a multiple dwelling shall provide electric light at all hours of the day and night in] Any occupied room[s] or space[s] in a multiple dwelling[s] in which laundry equipment is provided for the common use of the occupants [whenever natural light is insufficient in the opinion of the department] shall be illuminated by either natural light or electrical lighting to an average illumination level of at least twenty foot candles measured at a horizontal surface three feet above the floor. Any occupancy sensor lighting switches used in any such room or space shall conform with section 27-2038(a)(3).

Supporting Information

Issue – Expanded
The lights in the hallways, stairs, and laundry rooms of New York City apartment buildings burn all day and night at full brightness regardless of whether anyone is in those spaces or sunlight is streaming in. This is due to outdated requirements in the Housing Maintenance Code, which also specify minimum lighting levels in terms of watts (a measure of energy consumption) rather than foot-candles (a measure of lighting level). These same requirements specify particular lighting technologies rather than provide a performance standard, leaving no room for newer, energy-efficient technologies.

This proposal would treat sunlight as a source of illumination alongside electric lighting, permitting electric lighting to be dimmed during the day thereby saving energy. In keeping with industry standards, it would replace watts as the unit of measurement with foot-candles, replace requirements for particular lighting technologies with a performance standard, and establish minimum energy efficiency standards for lighting. Other provisions would authorize the use of bi-level lighting in hallways and stairs so that sensors can reduce lighting to a lower level when an area is unoccupied (returning to full brightness whenever a person enters the area). Finally, occupancy sensors would be permitted in laundry rooms, automatically turning off lighting when the rooms are unoccupied.

Environmental & Health Benefits
This proposal was found to have a low, positive environmental impact per building and to impact a large 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
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 first capital costs by 0.03% to 0.09%, depending on building type. It was thus
categorized as incurring a low to medium capital cost increment. This proposal was also estimated to generate financial savings that will pay for the capital costs in three to ten years depending on the building type.

**Precedents**

There are no known precedents for this proposal.

The Illuminating Engineering Society of North America (IESNA), which sets the standards for lighting across the country, recommends illumination levels of 5 foot-candles in hallways and 5-10 foot-candles in stairways. Energy analyses commonly identify lighting in unoccupied hallways, stairs, and laundry room as prime opportunities for energy efficiency upgrades.¹

**LEED**

There are no LEED credits directly affiliated with this proposal. However, 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 may also facilitate achieving LEED Energy and Atmosphere credits, which require exceeding the minimum standards established by the prerequisites:

- LEED NC-EA cr.1 Optimize Energy Performance
- LEED EB-EA cr.1 Optimize Energy Performance
- LEED CI-EA cr.1.1 Optimize Energy Performance, Lighting Power
- LEED ND-GCT cr.2 Energy Efficiency in Buildings
- LEED for Schools EA cr.1 Optimize Energy Performance
- LEED for Homes EA cr.1 Optimize Energy Performance
- Additional credits under LEED pilot programs.

**Implementation & Market Availability**

There are no known implementation issues for this proposal.

**Notes**

A more efficient use of lighting equipment and power would lead to reduced occurrences of equipment repairs and replacement, thereby reducing the level of building equipment failure and need for frequent building maintenance.

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**ENDNOTES:**

¹ **Seattle City Light, Built Smart City Manual** ch. 6 (2006), available at [http://www.ci.seattle.wa.us/light/Conserve/Resident/Bsdfinder/docs/cv5 bs1.pdf](http://www.ci.seattle.wa.us/light/Conserve/Resident/Bsdfinder/docs/cv5 bs1.pdf). (This developer incentive program of the Seattle utility company, Seattle City Light, notes that energy-efficient fixtures should be used common areas such as hallways, stairs, and laundry rooms. The program also recommends the use of sensors to reduce electric lighting when common areas are unoccupied or have adequate levels of daylight.)