

Preliminary draft of Planning's Article to revise bylaws on Outdoor Illumination for Annual Town Meeting 2020

[My Southborough Editor's Note: Reminder – This is just a preliminary draft of the proposed bylaw rewrite. The Planning Dept is still working on changes based on feedback and will be submitting a revised draft to Town Counsel, who may recommend more changes. The redlines below are my tracking of proposed changes (*from the draft posted for the January 6, 2020 Planning Meeting*) based on comparison to the existing bylaw.

My intent is to preview what the board is shooting for. For the actual details to be discussed at the January 27th hearing, look for an updated version on Planning's website closer to the meeting. Planning hopes to have something posted by early the week of January 20th.]

§ 174-12.1 Outdoor illumination.

A. Purpose. This section recognizes the benefits of outdoor lighting and provides clear guidelines for its installation, ~~so as~~ to help maintain and complement Southborough's character. The intent of this section is to ~~encourage lighting that provides safety, utility and security; prevent glare on public roadways; protect the privacy of residents; promote energy-efficient outdoor lighting; limit the total allowable illumination of lots located in the Town of Southborough; and to reduce atmospheric light pollution. Appropriately regulated, and properly installed, outdoor lighting will contribute to the safety and welfare of the residents of Southborough.~~

(1) Permit the use of outdoor lighting that does not exceed the minimum levels specified in recommended best practices for night-time safety, utility, security, productivity, enjoyment, and commerce.

(2) Minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light.

(3) Curtail light pollution, reduce skyglow and improve the night-time environment for residents of Southborough.

(4) Help protect the natural environment from the adverse effects of night lighting from gas or electric sources.

(5) Conserve energy and resources to the greatest extent possible.

B. Applicability. ~~Outdoor illumination by flood or spot luminaires rated at 900 lumens or more (which is approximately equal to one sixty-watt incandescent light bulb) or by any other luminaires rated at 1,800 lumens or more (which is approximately equal to one one-hundred-twenty-watt incandescent light bulb) shall be subject to the provisions of this section~~ Except as described below, all outdoor lighting installed after the date of effect of this bylaw shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party, with the following exceptions: emergency lighting; hazard warning; temporary decorative or holiday lighting or public roadway illumination. It shall also not apply to any luminaire intended solely to illuminate any freestanding sign, flag or the walls of any building, but such luminaire shall be shielded so that its direct light is confined to the surface of such sign, flag or building.

(1) The replacement of existing fixtures shall be subject to the provisions of this section; however, the replacement of existing nonconforming lamps or fixtures with the same or lower output nonconforming lamps or fixtures ~~is~~are exempted.

(2) The Planning Board, in performing review pursuant to § 174-10, Site plan approval, may determine that special circumstances of the site, context or design make an alternative lighting design at least equally effective in meeting the purposes of this section and, in such cases, may modify the requirements of this section.

C. Definitions. For the purposes of this section, the following terms shall be defined as indicated below. Although set forth here for convenience, the terms shall have the same effect as if in § 174-2 of this Bylaw.

BACKLIGHT – For an exterior luminaire, is the 90-degree quarter-sphere located behind and below the light source. For luminaires with symmetric distribution, backlight will be the same as front light.

BUG RATING – A luminaire classification system that classifies backlight (B), uplight (U), and glare (G) per IES TM-15-11.

CORRELATED COLOR TEMPERATURE - A specification of the color appearance of the light emitted by a lamp, relating its color to the color of light from a reference source when heated to a particular temperature, measured in degrees Kelvin (K).

FIXTURE — The assembly that houses a lamp or lamps, and which may include a housing, a mounting bracket or pole socket, a lamp holder, a ballast, a reflector or mirror, and/or a refractor, lens or diffuser lens.

FRONTLIGHT – For an exterior luminaire is the 90-degree quarter-sphere located in front and below the luminaire.

FULLY SHIELDED LUMINAIRE — A luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.

~~FULL CUTOFF—A luminaire designed with an opaque shield surrounding and extending below the lamp, such that no direct light is emitted above a horizontal plane.~~

GLARE — Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility. ~~Light emitted from a luminaire with intensity great enough to produce annoyance, discomfort or a reduction in a viewer's ability to see, and in extreme cases causing momentary blindness.~~

LAMP — The component of a luminaire that produces the actual light.

LED LAMP– (Light Emitting Diode) An electric lamp with a much longer lifespan than incandescent lighting and low energy consumption.

INDIRECT LIGHT – Light scatter caused by direct light being redirected from a surface.

LIGHT TRESPASS — The shining of direct or indirect light produced by a luminaire beyond the boundaries of the lot on which it is located.

LUMEN — A measure of light energy generated by a light source. One footcandle is one lumen per square foot. For purposes of this bylaw, the lumen output shall be the initial lumen output of a lamp, as rated by the manufacturer.

LUMINAIRE — The complete lighting unit (fixture), consisting of a lamp, or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to the power supply. ~~—A complete lighting system, including a lamp or lamps and a fixture.~~

LUMINAIRE LUMENS - For luminaires with relative photometry per IES, it is calculated as the sum of the initial lamp lumens for all lamps within an individual luminaire, multiplied by the luminaire efficiency. If the efficiency is not known for a residential luminaire, assume 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.

MOUNTING HEIGHT - The height of the photometric center of a luminaire above grade level.

UPLIGHT - For an exterior luminaire, is all of the light escaping above the luminaire.

D. Lighting Zones. The Lighting Zone shall determine the limitations for lighting as specified in this section.

LZ0: No ambient lighting Areas where the natural environment will be seriously and adversely affected by lighting. Impacts include disturbing the biological cycles of flora and fauna and/or detracting from human enjoyment and appreciation of the natural environment. Human activity is subordinate in importance to nature. The vision of human residents and users is adapted to the darkness, and they expect to see little or no lighting. When not needed, lighting should be extinguished.

Zoning Districts: Conservation and Research, Scientific & Professional

LZ1: Low ambient lighting Areas where lighting might adversely affect flora and fauna or disturb the character of the area. The vision of human residents and users is adapted to low light levels. Lighting may be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, most lighting should be extinguished or reduced as activity levels decline.

Zoning Districts: Residence A and Residence B

LZ2: Moderate ambient lighting Areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting may typically be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, lighting may be extinguished or reduced as activity levels decline.

Zoning Districts: Business Village

LZ3: Moderately high ambient lighting Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for

safety, security and/or convenience and it is often uniform and/or continuous. After curfew, lighting may be extinguished or reduced in most areas as activity levels decline.

Zoning Districts: Business Highway, Industrial and Industrial Park

E. Exterior lighting plan. Applications subject to the provisions of § 174-10, Site plan approval, shall submit a lighting plan which shall include the following information, except to the extent waived by the Planning Board. ~~All other lighting not subject to the provisions of said § does not require a lighting plan but shall meet the standards as set forth in this section, unless as may otherwise be provided herein. The lighting plan shall include the following information:~~

(1) Location, orientation and type of outdoor luminaire, including the height of the luminaire, both existing and proposed;

(2) Type of lamp, such as metal halide, compact fluorescent, high pressure sodium, LED;

(3) Luminaire manufacturer's specification data, including lumen output and other photometric data showing cutoff angles, as well as a description of all illuminating devices, fixtures, lamps, supports, reflectors, both existing and proposed; this may include, but is not limited to, catalog cuts and illustrations by manufacturers;

(4) Complete report of BUG rating data for all luminaires (if not already included in the manufacturer's specification data) calculated from photometric data (as per IES TM-15-11) showing compliance with the Planning Board Rules and Regulations for Outdoor Illumination.

(5) Photometric plan showing the intensity of illumination expressed in footcandles at ground level within the interior of the property and at the property boundaries; that includes the Total Site Lumen Limit, Limits to Off Site Impact, Light Shielding, and for LED lighting, the Correlated Color Temperature and S/P analyses according to guidelines provided in the Lighting Regulations document.

All other lighting not subject to the provisions of said § 174-10 does not require a lighting plan but shall meet the standards as set forth in this section, unless as may otherwise be provided herein.

~~(5) Evidence that the plan complies with light trespass restrictions as set forth herein~~

F. Total Site Lumen Limit. The total installed initial luminaire lumens of all outdoor lighting shall not exceed the total site lumen limit. The total site lumen limit shall be determined using the hardscape area and table below. For sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens. The total installed initial luminaire lumens are calculated as the sum of the initial luminaire lumens for all luminaires.

Table 1: Allowed Total Initial Lumens Per Site for Outdoor Lighting by Hardscape Area

<u>LZ-0</u>	<u>LZ-1</u>	<u>LZ-2</u>	<u>LZ-3</u>
<u>Conservation and Research, Scientific & Professional</u>	<u>Residential A and Residential B</u>	<u>Business Village</u>	<u>Business Highway and Industrial and Industrial Park</u>
<u>0.5 lumens per SF of hardscape</u>	<u>1.25 lumens per SF of hardscape</u>	<u>2.5 lumens per SF of hardscape</u>	<u>5.0 lumens per SF of hardscape</u>

G. Light Shielding for Parking Lot Illumination.

All parking lot lighting shall have no light emitted above 90 degrees.

Exception: Ornamental parking lighting shall be permitted by special permit only, and shall meet the requirements found in Tables 2a-c for Backlight, Uplight, and Glare, without the need for external fieldadded modifications.

H. Lighting Control Requirements. Automatic Switching Requirements Controls shall be provided that automatically extinguish all outdoor lighting when sufficient daylight is available using a control device or system such as a photoelectric switch, astronomic time switch or equivalent functions from a programmable lighting controller, building automation system or lighting energy management system, all with battery or similar backup power or device. The Exterior Lighting Plan shall establish curfew time(s) after which total outdoor lighting lumens shall be reduced by at least 30% or extinguished. Lighting reductions are not required for any of the following:

(1) With the exception of landscape lighting, lighting for residential properties including multiple residential properties not having common areas.

(2) When the outdoor lighting consists of only one luminaire.

(3) Code required lighting for steps, stairs, walkways, and building entrances.

(4) Lighting under canopies, in tunnels, parking garages, and similar conditions.

(5) When in the opinion of the Planning Board, lighting levels must be maintained.

(6) Motion activated lighting.

(7) Lighting governed by special use permit in which times of operation are specifically identified.

(8) Businesses that operate on a 24 hour basis.

~~**E. Flickering and flashing lights.** No flickering or flashing lights shall be permitted. Processes, such as arc welding, which create light flashes shall be confined within buildings or shielded to prevent either direct glare or flashing.~~

~~**F. Wall-mounted fixtures.** In nonresidential districts, a luminaire attached to the exterior of a building or structure for area lighting shall be mounted no higher than 15 feet above grade and shall be shielded to control glare. "Wal-pac" lighting fixtures are prohibited.~~

~~**G. Pole-mounted fixtures.** Pole-mounted exterior lighting fixture types are defined and restricted as follows:~~

~~Type A: no light cutoff.~~

~~Type B: luminaire shielded such that peak candlepower is at an angle of 75° or less from straight down, and essentially no light is emitted above the horizontal.~~

Type C: luminaire shielded such that total cutoff is at less than 90° from straight down, and no light source is in direct view of an observer five feet above the ground at any point off the premises.

Pole-mounted fixtures height limitation. Illustrations of pole-mounted exterior lighting fixture types are shown in Chart I herein. Pole-mounted fixtures shall not exceed the applicable pole-mounted height limitation set forth in Chart II in any district. The Type A pole-mounted exterior lighting fixture is prohibited in all nonresidential districts, unless equipped with shields.

[Delete graphic and table below]

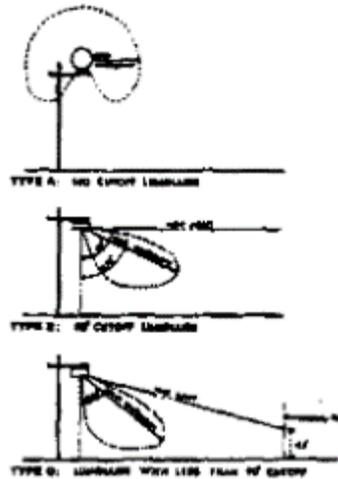


CHART II. POLE MOUNTING HEIGHT LIMITATIONS

Maximum Luminaire Mounting Height

(feet above grade)*

*"District" is that in which fixtures are located.

	District	
	Residential	Nonresidential
Fixture Type A	10	Not allowed (unless shielded)
Fixture Type B	15	20
Fixture Type C	20	20

* Note: Feet above grade refers to the overall average grade of the area being illuminated.

I. Ceiling-mounted fixtures. In nonresidential districts, luminaires mounted on an exterior ceiling such as under a canopy shall be mounted with the refractor or lens flush with or recessed in the ceiling or fixture.

J. Lighting levels. Any luminaire with a lamp or lamps rated at a total of 1,800 lumens or more (which is approximately equal to one one-hundred twenty-watt incandescent light bulb) and all flood or spot luminaires rated at 900 lumens or more (which is approximately equal to one 60-watt incandescent light bulb) shall not emit any direct light above a horizontal plane through the lowest direct light-emitting part of the luminaire. If any spot or flood luminaire rated 900 lumens or less is directed or focused such as to cause direct light from the luminaire to be cast toward

~~residential buildings on adjacent or nearby land, or to create glare perceptible to persons operating motor vehicles on public ways, the luminaire shall be redirected or its light output controlled as necessary to eliminate such conditions. The Planning Board reserves the right to limit and regulate the amount of illumination on a project site between the hours of 10:00 p.m. and 6:00 a.m., while understanding the need for safety and security lighting.~~

K. Light trespass limitations. ~~There shall be no light trespass by a luminaire beyond the property boundaries of the lot on which it is located, except as within a street right-of-way for which there shall be no limit.~~