

Chapter 15.22 Outdoor Lighting

Section 15.22.010 Short Title. This Ordinance may be cited as the “Outdoor Lighting Ordinance” of the City of Cambridge (the “City”).

Section 15.22.020 Purpose. The purpose of this Outdoor Lighting Ordinance is to regulate outdoor lighting, as defined in this Ordinance, in the City, the intent being to permit an amount of outdoor lighting that is appropriate to allow for the safe use and enjoyment of outdoor areas, while also mitigating light trespass and glare to abutters and the public at large, reducing light pollution, and promoting energy conservation.

Section 15.22.030 Definitions.

- A. Architectural lighting** ~~See “**Facade lighting.**” means lighting designed to reveal architectural beauty, shape and/or form and for which lighting for any other purpose is secondary.~~
- B. Building Thermal Envelope** ~~means the basement walls, exterior walls, floor, roof, and any other building elements that enclose conditioned space or provides a boundary between conditioned space and exempt or unconditioned space.~~
- C. Conditioned Space** ~~means an area or room within a building being heated or cooled, containing uninsulated ducts, or with a fixed opening directly into an adjacent conditioned space.~~
- D. Correlated color temperature (“CCT”)** means 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 Kelvin (K).
- ~~B.E.~~ **Facade lighting** ~~means the illumination of the exterior surfaces of buildings for the enhancement of their nighttime appearance. Achieved by shining light onto building surfaces, or by concealed illumination of translucent building surfaces. The light sources must be shielded from direct view from the adjacent properties and buildings.~~**
- ~~C.F.~~ **Glare** means lighting entering the eye directly from **light fixtures** or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.**
- ~~D.G.~~ **Illuminance** means the density of the luminous flux incident on a surface; it is the quotient of the luminous flux by the area of the surface when the latter is uniformly illuminated.**
- ~~E.H.~~ **Lamp** means a source of optical radiation, often called a “bulb” or “tube,” such as**

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incandescent, fluorescent lamps, high-intensity discharge (“HID”) lamps, and low pressure sodium (“LPS”) lamps, as well as light-emitting diode (“LED”) modules and arrays.

~~F.I.~~ **Landscape lighting** means lighting of trees, shrubs, or other plant material as well as ~~ponds and other landscape features, water features and sculptural objects. The light sources must be shielded from direct view from the adjacent properties and buildings.~~

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~~G.J.~~ **Laser** means a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation which is also a term that originated as an acronym for “light amplification by stimulated emission of radiation”.

~~H.K.~~ **Light bulb.** See “Lamp.”

~~I.L.~~ **Light fixture** means a complete lighting unit consisting of one or more light bulbs together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply. Sometimes this includes ballasts or drivers, and photocells.

~~J.M.~~ **Light trespass** means lighting that falls beyond the boundaries of the property it is intended to illuminate.

~~K.N.~~ **Lighting** means electric, man-made, or artificial lighting. See lighting equipment.

~~L.O.~~ **Lighting equipment** means equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(es), electrical wiring, and related structures or other necessary or auxiliary components.

~~M.P.~~ **Lighting plan** means a site plan depicting the property lines of all properties for which lighting is proposed, the location and specification of all exterior light fixtures to be installed within the property, their lumen values, mounting heights, shielding and directionality, controls and the location of all adjacent streets, the uses of abutting properties and properties located directly across a street, any relevant project site conditions, ~~vertical illuminance calculations at lighting boundaries,~~ and any additional information required to demonstrate compliance with applicable standards.

Commented [BC5] : Removing “vertical illuminance” from lighting plan since it not part of the ISD documentation under the Prescriptive Standard or one of the options under the Performance Standard.

~~N.O.~~ **Light pollution** means adverse effects of lighting, as defined in this Ordinance, including, but, not limited to, glare, light trespass, sky glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

~~O.R.~~ **Lighting Zone (“LZ”)** means an area or district within which particular lighting standards apply as set forth in this Ordinance. Lighting Zones are delineated by reference to the districts established with the Zoning Map of the City of Cambridge. **Lighting Zone 3 includes the following applicable zoning districts:** Residence C-3, C-3A or C-3B;

Office 2, 2A or 3; Business B or C; Industry B, B-1, B-2 or C; Special Districts 1, 3, 4, 4A, 5, 6, 7, 8, 11, 15 and any other Special District whose general zoning limitations derive from one of the previously listed base zoning districts; Mixed-Use Development District: Kendall Square (MXD) and Cambridgeport Revitalization Development District (CRDD); all Planned Unit Development (PUD) districts and Alewife Overlay Districts (AOD).

Lighting Zone 2 includes the zoning districts not listed under Lighting Zone 3.

P.S. Lumen means the unit of measure used to quantify the amount of light produced by a lamp or emitted from a luminaire or light fixture (as distinct from “watt” or other measure of a lamp’s power consumption).

Q.T. Lux means the SI (International System of Units) unit of illuminance. One lux equals one lumen per square meter and is approximately equal to 1/10 of a foot candle.

R.U. New lighting means lighting for areas not previously illuminated, or newly installed lighting of any type, except for replacement lighting or lighting repairs.

S.V. Outdoor or exterior lighting means lighting equipment installed within the property line and outside the ~~building thermal envelope~~ ~~habitable~~-building envelope of a subject property, whether attached to poles, building structures, the earth, or any other location, and any associated lighting control equipment.

T.W. Parties in Interest means the petitioner, abutters, owners of land directly opposite on any public or private street or way, and abutters to the abutters within three hundred feet of the property line of the petitioner as they appear on the most recent applicable tax list, or others materially impacted by the lighting equipment within City boundaries, ~~notwithstanding that the land of any such owner is located in another city or town the planning board of the city or town, and the planning board of every abutting city or town."~~

U.X. Partly shielded light fixture means a light fixture with opaque top and translucent or perforated sides, designed and maintained to emit most light downward.

V.Y. Public Art means art in any media that has been planned and executed with the intention of being staged in the physical public domain, usually outside or in publically accessible buildings that are accessible to all.

W.Z. Replacement lighting means lighting equipment, fixtures, or parts, including lamps and light bulbs installed in order to replace existing lighting equipment.

~~X-AA.~~ **Seasonal lighting** means lighting in use for not longer than a six-week period in any calendar year.

~~Y-BB.~~ **Shielded directional light fixture** means a fixed or adjustable light fixture that also contains a shield, hood, cowl, louver, or baffle to reduce direct view of the lamp.

~~Z-CC.~~ **Substantial renovation** means work area as defined in the building permit that is 50% or more of the Gross Floor Area of the building or 50% of the exterior wall area of the building,

~~AA-DD.~~ **Sky glow** means the brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere, caused by light directed or reflected upwards or sideways, and which reduces ability to view the night sky.

CC. Unshielded light fixture means a light fixture capable of emitting light in any direction.

DD. Vertical illuminance means illuminance measured or calculated in a plane perpendicular to the property boundary or property line of a subject property.

Section 15.22.040 Effective Date This Ordinance shall take effect on three (3) months from the date of enactment.

Section 15.22.050 General Requirements.

A. Conformance with all Applicable Codes. The provisions of this Ordinance shall be interpreted and applied at all times consistently with the provisions of all applicable federal, state, and local laws, rules, and regulations, including, but not limited to, applicable sections of the Massachusetts Building Code, the Cambridge Zoning Ordinance, and the Cambridge Municipal Code. This Ordinance recognizes that certain restrictions on illuminance in zoning ordinance **In the event of a conflict, the most restrictive provision shall apply.**

B. Applicability. Except as set forth in this Ordinance, all outdoor lighting installed after the effective date of this Ordinance shall comply with the requirements of this Ordinance. This includes, but is not limited to, new lighting equipment, light fixtures, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location. Except as otherwise provided in this Ordinance, all outdoor lighting installed prior to the effective date of this Ordinance shall be altered or changed so as to comply with these requirements within five (5) years of the effective date of this Ordinance. ~~None of these provisions shall be construed so as to prevent or delay~~

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~~ongoing enforcement of existing Cambridge Zoning Ordinance provisions concerning lighting in residential zones, and lighting of signs, parking areas, driveways, and loading bays.~~

- C. Interim Modifications.** Upon the effective date of this Ordinance, property owners shall make improvements where possible to eliminate or minimize light trespass **on other properties** by: (1) replacing a lamp(s) within an existing light fixture to be in conformance with the lumen limitation and **Light Color Standard** of this Ordinance, and/or (2) changing the shielding **and** direction of elements of an existing fixture to be directed downward **and/or** away from other properties.
- D. Light Color Standard.** Correlated color temperature of any outdoor light source shall not exceed 3500 Kelvin unless introduced as part of an architectural lighting scheme used exclusively for the **decorative illumination through color of certain building façade or landscape features**; **be required to meet the Performance or Prescriptive Standard shall still apply.**
- E. Substantial Renovation.** If any substantial renovation of an existing building or property occurs after the effective date of this Ordinance, then that property shall be required to meet the Standards set forth in this Ordinance.
- F. Laser Light Ban.** **Laser light** is strictly prohibited for outdoor use unless otherwise exempted in this Ordinance.
- G. Flashing or Intermittent Light.** Any lighting which flashes, moves, **or incorporates rapid color or intensity changes** is prohibited in all Lighting Zones, unless otherwise provided in this Ordinance.
- H. Prescriptive and the Performance Standard.** All outdoor lighting must comply with the **Light Color Standard and either** the Prescriptive Standard or the Performance Standard, **as set forth below. For properties 10,000 square feet and larger, a lighting plan must be submitted to Inspectional Services Department (ISD).**

1. Prescriptive Standard

Outdoor Lighting Category	Maximum - Allowed Lumens Per Light Fixture	Maximum Height	Shielding and Direction
Unshielded or partly shielded light fixture placed not less than 4 feet apart	315	12 feet above the surface of the area to be illuminated	Not applicable
Up to two unshielded or partly shielded light fixtures located in a main entry area, placed not less than 4 feet apart.	630	12 feet above the surface of the area to be illuminated	Not applicable
Shielded directional light fixtures, placed not less than 4 feet apart, for entries, walkways, and architectural lighting.	1,050	12 feet above the surface of the area to be illuminated.	All light fixtures shall be located, aimed, and shielded so as to minimize light pollution and light trespass across property boundaries. Light fixtures for entries and walkways shall emit light in a downward direction only.

Shielded directional light fixtures for parking areas, driveways, or outdoor loading bays.	1,260	14 feet above the surface of the parking area, driveway or loading bay	All light fixtures shall be located, aimed, and shielded so as to minimize light pollution and light trespass across property boundaries.
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2. Performance Standard.

In order to apply the Performance Standard, permit applicants must submit a lighting plan and accompanying calculations that demonstrate conformance with the U.S. Green Building Council’s LEED Light Pollution Reduction (LPR) credit v4 BD+C ~~without making use of LPR credit’s exemption for lighting subject to automatic shutoff from midnight until 6 am.~~ The lighting plan and accompanying calculations must be prepared and certified by a registered architect or professional engineer licensed in the Commonwealth of Massachusetts and must be approved by the Cambridge Inspectional Services Department (ISD). Even if approved, should the lighting as installed and maintained fail to meet the Light Color Standard and/or the minimum LEED LPR Credit requirements ~~excluding the automatic shutoff exemption~~ and be determined to be in violation of the light pollution and light trespass protections afforded in the LEED LPR Credit system, then that lighting shall be considered in violation of this Ordinance.

Commented [BC7] : It was proposed at the February 2016 Outdoor Lighting Task Force meeting that the Planning Board and CDD staff could address the concerns over Façade and Landscape Lighting that are part of developments and building renovations reviewed by CDD.

I. Exemptions from Applicability. The following exemptions assume a good faith effort has been made to achieve near or partial compliance with the provisions of the Ordinance where feasible and allowable by law.

1. Lighting within public ways for the principal purpose of illuminating public ways. No exemption shall apply to any lighting within a public way when the purpose of the light fixture is to illuminate areas outside the public way, other than as provided in this Ordinance.
2. Lighting for public parks or public art that is accessible to the general public and is commissioned, owned, or operated by a city, state, or federal entity, or that is required by the City, by special permit, or otherwise by law.
3. Lighting for public monuments, statuary, or the national flag in cases where compliance with the Standards of this Ordinance are specifically prohibited by law or conflicting with superseding requirements.

4. Architectural lighting that has been reviewed by and has received a Certificate of Appropriateness from the Cambridge Historical Commission.
5. Lighting solely for signs as regulated under Article 7 of the Cambridge Zoning Ordinance.
6. Lighting for theatrical or television production or performance areas, if an electrical permit has been received from the City's Inspectional Services Department.
7. Lighting for work areas at construction sites, if an electrical permit has been received from the City's Inspectional Services Department.
8. Underwater lighting in swimming pools and other water features.
9. Seasonal lighting as defined in this Ordinance.
10. Lighting that is only used under emergency conditions.
11. Lighting required by federal, state, or local laws, rules or regulations.
12. Lighting for sports facilities, including but not limited to outdoor conditioned or unconditioned rinks, open courts, fields, and stadiums. All light fixtures shall be directed and shielded in a way that minimizes light trespass and sky glow. Lighting for the playing surfaces and spectator areas must be turned off after the activities have ceased or 11:00 PM, whichever is earlier.

Commented [L8]: CHC has not agreed to do this review.

Section 15.22.060 Administrative Exemption. The Commissioner of Inspectional Services ("the Commissioner") or, if that position is vacant, the person designated to act in his or her stead, shall have the authority to grant a partial or complete waiver of the requirements of this Ordinance according to the following procedures:

Commented [L9]: Waiver or Variance instead?

- A. Any applicant seeking an exemption from this Ordinance shall file an application with the Inspectional Services Department (ISD) describing in detail with supporting information and documentation the nature, duration, location and specifications and other particulars of the waiver being sought. The Application for Administrative Exemption must demonstrate that: a) bringing the source of light for which the Administrative Exemption is sought into full compliance with this Ordinance would constitute a demonstrably unreasonable hardship on the applicant, as balanced against the potential impacts on parties in interest and others affected by the lighting; or b) bringing the source of light for which the Administrative Exemption is sought into full compliance with this Ordinance would result in conditions that are materially detrimental to health, safety, or welfare. The property owner seeking the Administrative Exemption shall file the Application with the ISD demonstrating at least one of the two

requirements for an administrative exemption listed above. The property owner may also provide for consideration an alternative plan(s) that demonstrate(s) the ability to substantially mitigate negative effects of non-compliance. The Commissioner may determine an appropriate application fee and levy any such fee upon accepting an application.

- B. ISD shall then give written notice to each of the parties in interest, including specific information on the nature, duration, location, and specifications and other particulars of the waiver being sought, at least 14 days in advance of any hearing, proceeding, or decision. Any person who claims that he/she or occupants of his/her property would be adversely affected by a grant of the Administrative Exemption may file a statement and materials with ISD containing information to support his/her claim.
- C. In determining whether to grant or deny the Administrative Exemption and what, if any, conditions and limitations (including a time limit) to impose, the Commissioner shall balance the hardship to the applicant of not granting the exemption, against the adverse impact on the health, safety, and welfare of persons affected, the adverse impact on property affected, and any other adverse impacts of granting the Exemption. Applicants for an Administrative Exemption and persons contesting an Exemption may be required to submit any additional information and materials that the Commissioner may reasonably require. In granting or denying an Administrative Exemption the Commissioner shall place on public file copies of the application for exemption, all accompanying submissions, the notices to parties in interest, including confirmation of when the notices were given, plus any statements and materials filed by the parties in interest, and the decision (including all conditions and limitations) and the reasons for granting or denying the Exemption, as well as any other documentation associated with the process.
- D. Administrative Exemptions or partial exemptions shall be granted by notice to the applicant containing all conditions and limitations, including any time limit on the activity. No Exemption shall become effective until all conditions and limitations are agreed to by the applicant in writing filed with ISD. Noncompliance with any condition of the Exemption shall terminate it and subject the person holding it to those provisions of this Ordinance.
- E. Any Administrative Exemption may be reviewed, adjusted, or repealed by the Commissioner of Inspectional Services at any time after two years.
- F. The Commissioner may issue guidelines further defining the procedures to be followed in applying for an Administrative Exemption and the criteria to be considered in deciding whether to grant an Administrative Exemption.

Section 15.22.070 Enforcement.

- A. Enforcement Officials.** The Commissioner of Inspectional Services or her/his designee shall be the authorized enforcement personnel charged with the enforcement of the provisions of this Ordinance.
- B. Complaints.** The Inspectional Services Department shall provide a system for receiving and responding to complaints of non-compliance with the Ordinance in a timely manner.
- C. Violations.** Authorized enforcement personnel may order and specify remedial actions to be taken by a violator of this Ordinance to achieve compliance, or issue citations, pursuant to G. L.c. 40, § 21D, for violations of these provisions, assessing fines of three hundred dollars for each such violation. Each day such a violation continues shall constitute a separate offense. Additionally, any person found to be in violation of any of the provisions of this Ordinance may be prosecuted for a misdemeanor and upon conviction thereof shall be fined three hundred dollars for each such misdemeanor.
- D. Injunction.** As an additional remedy, any outdoor lighting installed or maintained in violation of any provision of this Ordinance may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.
- E. Suspension or Revocation of Permit.** As an additional remedy, any enforcement official hereunder may summarily suspend, and after a hearing may revoke, any license or permit, including a building, demolition, or electrical permit.