

Summary of Lighting Regulations

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1 Introduction

This document summarizes existing regulations related to lighting, in the City of Toronto. Comments are given as footnotes. All quotations have been abbreviated to focus on passages relevant to the issue of light pollution. Refer to the original document for the complete wording.

2 Property Standards, Chapter 629 of the Municipal code

http://www.toronto.ca/legdocs/municode/1184_629.pdf

Lighting regulations begin on page 36.

- A. Adequate artificial light required to maintain the level of illumination shall be provided at all times¹.
- B. Interior Lighting².
- C. For parking lots, walkways, stairs, porches, verandas, loading docks, ramps or other similar areas, a minimum level of illumination of 10 lux (0.90 foot-candle) at ground or tread level and at angles and intersections at changes of level where there are stairs or ramps. [Added 2008-04-29 by By-law No. 349-2008]³
- D. Interior and exterior lighting fixtures and lamps shall be installed and maintained so that the work, operations or activities normally carried out in or about any part of the property can be undertaken in safety and without undue eye strain.

¹Adequate is not defined.

²Generally not relevant to the issue of light pollution, see original document.

³This is a very high level, considering that sidewalks are illuminated to about 3 lux. Furthermore, specifying 10 lux as a minimum means that the average and peak illuminances must be larger. Nonetheless, it is possible to establish light trespass and glare recommendations that are consistent with this requirement. The lamps would have to be focussed on the target, be shielded from view, and be limited to within the property boundary.

3 Green Development Standard

3.1 Low Rise Non-Residential

http://www.toronto.ca/planning/environment/pdf/lr_nonres_tech.pdf

1. All exterior light fixtures should be efficient while providing minimum illumination levels sufficient for personal safety and security. Safety and security lighting should minimize glare and/or light trespass. Refer to the Illuminating Engineering Society of North America (IESNA) Recommended Practice Manual: Lighting for Exterior Environments (www.iesna.org) for requirements for partially or fully shielded exterior lighting⁴.
2. Light trespass is unwanted stray light shining across property boundaries. Any light fixture installed on a property must direct and shield light coming from the fixture so that the light source is not directly visible from any adjacent property. Lighting must focus downward, eliminating direct upward light and reducing spill light.
3. Glare is the physical sensation caused by artificial light that is brighter than one's adapted surroundings. Glare is produced by a bare light shining directly into the eyes of the observer.
4. Excessive rooftop lighting that contributes to light pollution is not permitted. Architectural illumination may be permitted in accordance with the following performance specifications:
 - Shield exterior light fixtures to prevent light trespass.
 - Architectural illumination is turned off year round from 11pm - 5am using an automatic device.
5. After hours override may be provided by a manual or occupant sensing device provided that the override lasts no more than 30 minutes.
6. Openings in the building envelope, transparent or translucent, include all fenestration (windows, doors, skylights, curtain walls). Provide shielding with less than 10% transmittance overnight.⁵
7. For details on ways to make buildings better for birds including lighting, building operations and site management, refer to the Bird-Friendly Development Guidelines⁶.

Required

EC 6.1 Install exterior light fixtures that are shielded to prevent glare and/or light trespass onto any neighbouring properties.

EC 6.2 No up-lighting from exterior light fixtures unless otherwise permitted through a heritage designation.

Recommendations

- No vanity lighting
- Fixtures that effectively project light downwards
- Building automation systems
- Use motion sensor lighting
- Task or workstation lighting

⁴Unfortunately, IESNA does not deal with the issue of glare. The IESNA recommended levels may be somewhat excessive. Notice that Glare and light trespass are used in this section (1) and then defined in 2 and 3.

⁵Good attempt to limit spill light, but might be better by specifying the maximum luminance of the building windows (an approach used by the CIE standard.) Otherwise the spill light depends on the intensity of the interior light, which is not specified here.

⁶See section 4, page 3 of this document.

3.2 Low-Rise Residential

http://www.toronto.ca/planning/environment/pdf/lr_res_tech.pdf

(Similar to section A above, Low Rise Non-Residential.)

Required

EC 6.1 No up-lighting from exterior light fixtures.

EC 6.2 Install exterior light fixtures that are shielded to prevent glare and/or light trespass onto any neighbouring properties

Recommendations

- No vanity lighting
- Use motion sensor lighting
- Occupancy sensors/timers for exterior lighting

3.3 Mid to High Rise (4 storeys or greater, all uses)

http://www.toronto.ca/planning/environment/pdf/mr_hr_tech.pdf

Pedestrian scaled lighting must be directed downward and includes fixtures such as bollards or lower-scale pole fixtures along pedestrian routes

Required

AQ 3.4 Use pedestrian-specific lighting directed onto sidewalks, pathways, entrances and outdoor waiting areas.

(Similar to sections A and B above.)

Recommendations

- No vanity lighting
- Fixtures that effectively project light downwards
- Occupancy sensors in parking structures
- Building automation systems
- Use motion sensor lighting

4 Bird Friendly Development Guidelines

http://www.toronto.ca/lightout/pdf/development_guidelines.pdf

Birds in urban areas, especially during migrations, are disoriented by misleading images of modern buildings and light pollution. Pages 19 to 26 are an excellent introduction to the subject of light pollution. Pages 25 and 26 show Preferred and Discouraged Lighting fixtures.

5 City of Toronto Accessibility Design Guidelines

http://www.toronto.ca/parks/pdf/engagement/accessibility_guidelines.pdf

Lighting for Exterior Areas not including roads

- Exterior lighting should be designed generally in accordance with I.E.S.N.A. (Illuminating Engineering Society of North America) standards, in all public thoroughfares and along all pedestrian routes to ensure safe access for persons with disabilities at sidewalks, bus stops, or parking areas leading to public facilities or amenities. Lighting levels of 100 lux. (10 ft. candles) measured at the ground of all accessible pedestrian entrances are recommended as an aid to persons with visual disabilities.

At frequently used pedestrian routes (including paths, stairs, and ramps) recommended lighting levels should be 30 lux. (3 ft. candles)⁷.

- In accessible parking areas, lighting levels are recommended to be a minimum of 50 lux (5 ft. candles) at accessible parking spaces and along accessible routes from areas of parking to accessible entrances.
- Lighting sources should be selected and located at, or beside steps and stairs, to ensure clear definition of treads, risers, and nosings.
- All lighting over pedestrian routes should be evenly distributed, provide areasonable colour spectrum, and minimize cast shadows for persons with low vision.
- Supplementary lighting should be provided to highlight all key way-finding signage.
- Lighting standards or posts should be mounted to one side of pedestrian walkways so as not to inhibit free movement of persons using mobility aids.
- Low-level lighting standards should be tall enough to clear normal snow accumulation heights.
- Overhead light fixtures should be mounted on standards that ensure clear headroom of 2030 mm is available, below fixtures or supports, as an aid to persons with visual limitations.
- Lighting of landscape on special site features should be designed and installed to minimize direct glare to both pedestrians and building users.
- This does not include lighting for roads and expressways. The Transportation Division of Works & Emergency Services Department is currently developing a Lighting Master Plan which will incorporate street lighting. It is anticipated that this Master Plan will be completed by the end of 2004⁸.
- Lights below 1525 mm illuminate surface only and must not glare into people's eyes⁹.

6 City of Toronto, Sign Bylaw, No. 196-2010

<http://www.toronto.ca/legdocs/bylaws/2010/law0196.pdf>

694-18. Illumination

- A. No first party sign shall be illuminated at any time when a smog alert is in effect.
- B. All first party signs shall cease to be illuminated within four hours of the issuance of the smog alert.
- C. No sign shall be illuminated between the hours of 11:00 p.m. and 7:00 a.m. except where:
 1. The sign is a first party sign associated with a lawful business which operates during this period and only while the business is actually in operation; or
 2. The sign is located in the Downtown Yonge Street Special Sign District, the Dundas Square Special Sign District, or the Gardiner Gateway Special Sign District.

⁷Both these levels are very high, considering that sidewalks are normally lit to about 3 lux. Notice that these are recommendations, not requirements.

⁸Apparently, this was never completed. There is no such document on the web.

⁹Designers of the glare-producing bollards at the Ontario Science Centre please take note.

E. Unless otherwise expressly prohibited by this chapter, all signs may be illuminated provided the following requirements are met:

1. The sign shall not be up-lit,
2. The light shall not project onto any adjacent premises located in an R, RA, CR, I, or OS sign district¹⁰;
3. The illumination shall not increase the light levels within 10.0 metres of all points of the sign face by more than 6.5 lux above the ambient lighting level;
4. The illumination shall not exceed 5,000 nits¹¹ during the period between sunrise and sunset; and
5. The illumination shall not exceed 500 nits during the period between sunset and sunrise.

¹⁰These districts are Residential, Commercial Residential, Institutional or Open Space. See page 21 of the Bylaw.

¹¹One nit is equal to 1 candela per square metre.