



PORT METRO
vancouver

Project & Environmental Review

Guidelines – Lighting

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1. INTRODUCTION

These guidelines are intended to assist applicants of projects on lands and waters managed by Port Metro Vancouver when determining outdoor lighting requirements and/or preparing outdoor Lighting Plans for proposed projects.

2. OVERVIEW

Poorly designed or installed outdoor lighting may cause unsafe and unpleasant site conditions, impair the productive use of Port Metro Vancouver property and tenants' facilities, have other negative off-site impacts, and result in unnecessary use of electric power. This document provides information and guidance relating to the design, installation and operation of lighting proposed through Port Metro Vancouver's Project and Environmental Review process.

In some cases these guidelines highlight best practices or sources of useful information in lighting selection and design. In other cases more specific recommendations are made regarding lighting standards. The intent is to allow for flexibility in responding to these guidelines to enable applicants to design and deliver their projects consistent with specific needs and contexts. In all circumstances good engineering practices and sound engineering judgment should be used in determining the most appropriate lighting solutions in context of site-specific needs.

3. PRINCIPLES/OBJECTIVES

These guidelines are intended to assist applicants in determining the appropriate exterior lighting for their facilities in order to:

- Promote safety, security and productivity on port sites;
- Reduce unwanted light spill and other impacts on adjacent properties and communities; and
- Conserve electrical energy and reduce unnecessary use of electrical power.

4. APPLICABILITY

These guidelines apply to all proposed developments on Port Metro Vancouver property that require a project permit, and are applicable to the design, construction and operation of the proposed facilities.

5. GUIDELINES

Lands must be serviced with lighting to a standard that would be expected of any new development and/or retrofit. Port Metro Vancouver's Lighting Guidelines should be considered in conjunction with the IESNA and other applicable standards, and will be used by Port Metro Vancouver staff in reviewing project permit applications.

5.1 GENERAL CONSIDERATIONS

- a) Sufficient light should be provided on any Port Metro Vancouver site during construction and operation to help ensure facilities are operated in a safe, secure and efficient manner.
- b) Proposed projects on Port Metro Vancouver lands must conform to all applicable legislation and regulations.
- c) Outdoor lighting should be designed in a way that provides a distribution of light that is appropriate to context without compromising safety and security – lighting installations should be designed to minimize harsh contrasts in colour or lighting levels.
- d) All exterior lighting should be properly maintained and remain in good working order with regular inspections.
- e) Light fixtures should be energy-efficient while providing minimum illumination levels sufficient for personal safety and security, considering nationally recognized standards. Consider Best Available Technology for most energy efficient lighting. The preference is for LED technology where feasible. Consider installation of controls (photocells and/or timers) to automatically shut off or dim exterior lights when not required for safety or operation, especially if not required during daylight hours or when the facility is not in use.
- f) Lighting must not interfere with the visibility of existing or planned navigational aids. Navigational aids are lights used by vessel pilots and captains to navigate in darkness or during periods of reduced visibility. Waterfront sites must take the location of any navigational aids into account when considering the addition of new site lighting.
- g) Conform with International Safety Guide for Oil Tankers and Terminals and other international standards where applicable.
- h) Ensure that appropriate and reasonable measures are taken in order to reduce the impact of lighting on adjacent tenants and residents, minimize light trespass from the site, and reduce development impact on nocturnal environments:
 - i. Lighting should not cause unnecessary glare to motorists or pedestrians and all reasonable means should be taken to prevent the projection of light onto neighboring properties.
 - ii. Where possible, shield exterior fixtures such that the installed fixture does not directly emit any light at a vertical angle more than 90 degrees from straight down. LED lights, with a variety of directional optics available, may not require additional shielding. For reference purposes, the following diagrams illustrate the use of cut-off fixtures to reduce glare.

Figure 1: Unshielded Fixture Causing Glare

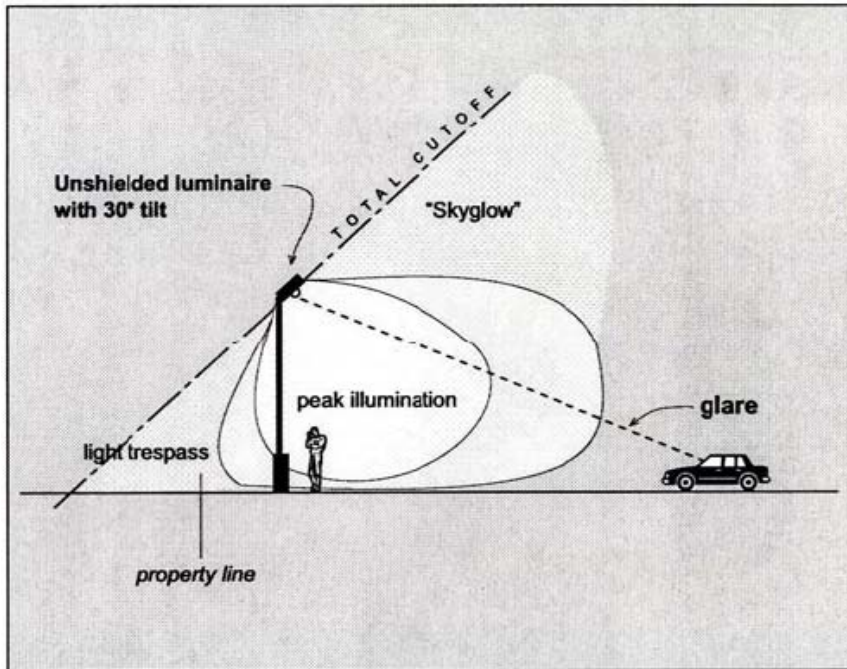
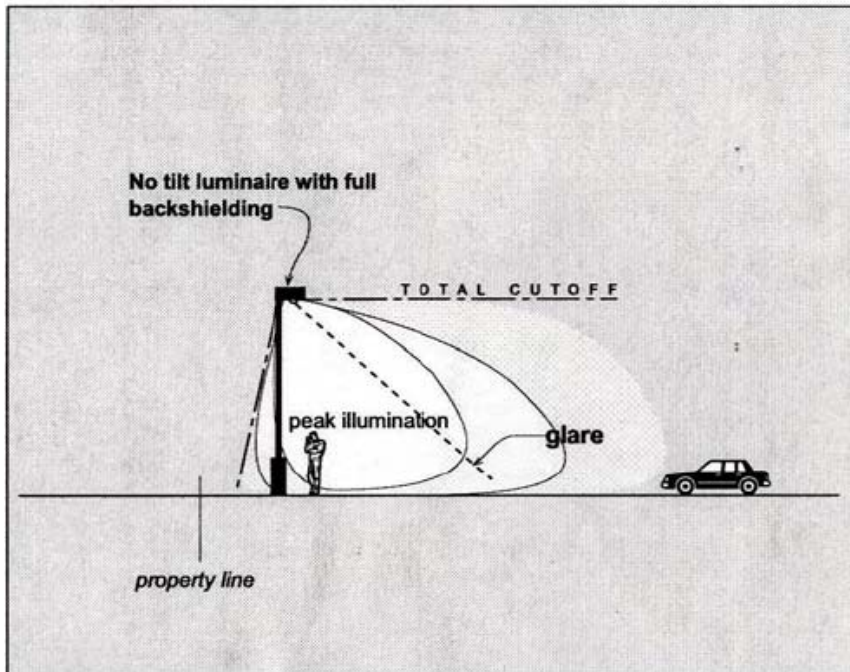


Figure 2: Full Cut-off Fixture with Reduced Glare



5.2 LIGHTING PLANS

Applications for proposed projects under Port Metro Vancouver's Project and Environmental Review process may be required to prepare customized Lighting Plans to support the application. Lighting Plans should be designed to minimize glare, light trespass, energy conservation and to maintain dark skies while ensuring safety and security. The requirement for a Lighting Plan will be confirmed in the preliminary review phase of the Project and Environmental Review process.

Lighting Plans should generally be prepared by a qualified lighting professional. At a minimum, Lighting Plans should include the following:

- Proposed lighting should be depicted on a site plan and include a KEY to the proposed lighting that provides the following information:
 - o location of all current and proposed exterior lighting fixtures on the premises, as well as the location of the proposed power source;
 - o type of illuminating devices, fixtures, lamps, supports, reflectors, and other devices – including the cut-off characteristics;
 - o lamp source type (e.g. high pressure sodium, LED, etc.), lumen output, and wattage;
 - o expected change in wattage for site;
 - o mounting height with distance noted to the nearest property line for each fixture, with orientation noted;
 - o types of timing devices used to control the hours set for illumination, as well as the proposed hours when each fixture will be operated;
 - o cumulative lighting data for the overall lighting installation including design power consumption, average illumination and uniformity levels.
- The Lighting Plan should clearly indicate the regulations and standards applied in designing, selecting and/or locating exterior lighting in proposed projects.
- Where appropriate, the Lighting Plan may need to include an Impact Statement which identifies the impacts of proposed exterior lighting on adjacent residential areas. The Impact Statement should also identify the location of species sensitive to light that may be impacted by the proposed development. Mitigation measures should be included in the Lighting Plan in order to respond to issues identified in the Lighting Impact Statement.

6. DEFINITIONS

Cutoff Fixture is a fixture that provides a cutoff (shielding) of the emitted light.

Glare a) light emitting from a fixture with intensity great enough to reduce a viewer's ability to see, or to produce sensation of discomfort.

b) the physical sensation caused by artificial light that is brighter than one's adapted surroundings.

Light Pollution is any adverse effect of artificial light, including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste. In addition, ecological light pollution produces documented effects on the behavior of many wild species.

Light Trespass is the unwanted shining of light produced by a fixture beyond the boundaries of the property on which it is located, resulting from fixtures that shine light beyond their target areas. This potentially undesirable light can fall into neighboring buildings and infringe on people's outdoor activities.

Fixture is the unwanted shining of light produced by a fixture beyond the boundaries of the property on which it is located, resulting from fixtures that shine light beyond their target areas. This potentially undesirable light can fall into neighboring buildings and infringe on people's outdoor activities.

Sky Glow occurs when artificial light is projected into the sky and spreads, causing a glow above populated areas.

7. NOTES/LINKS TO OTHER DOCUMENTS

These guidelines should be considered in conjunction with other best practices and applicable legislation, such as:

- *Illuminating Engineering Society of North America (IESNA) Lighting Handbook*
- *National Building Code of Canada*
- *Canada Occupational Health and Safety Regulations*
- *International Safety Guide for Oil Tankers and Terminals (ISGOTT)*

8. UPDATES

These guidelines are available for viewing and downloading from our website (www.portmetrovancover.com). To ensure that you are referring to the most up-to-date document please reference the version date clearly indicated on the front page.