

# Standard Specifications for Retrofit Lighting

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## 1. Permits

It is the responsibility of the customer and/or contractor to obtain any required permits for the project before installation, and it is the responsibility of all relevant parties to have all appropriate licenses. The cost of all required permits must be included in the submitted bids.

## 2. General Requirements

**It shall be the responsibility of both the customer and contractor to be familiar with the details of this document. Customers may wish to provide a copy to the contractor they are working with to ensure compliance.**

- Equipment funded by Seattle City Light or another utility at the point of sale or through the distributor (prior to installation) is not eligible for funding through Seattle City Light programs that issue payment after installation. Funding issued after installation requires submittal of itemized equipment invoices to allow the utility to determine whether or not the equipment purchase was supported by pre-installation funding.
- The cut sheets for this project shall be submitted at the time the project is presented to Seattle City Light for approval.
- All lighting fixtures shall be certified for the specific type of application (wet, dry, damp, etc.).
- All lighting equipment must be of current manufacture and must carry a safety certification by an approved testing laboratory (UL, CE, ETL, etc.).
- All lighting shall have control—manual and/or automatic—by which it can be turned off completely without significant degradation to the life or performance of the lighting equipment. When it is turned off, it shall consume no electric energy.
- All lamps, ballasts and controls serving the same fixture must be fully compatible, providing full operability of all components without significant reduction in component performance or service life. **The compatibility requirement covers new components and any existing lamps, drivers, ballasts, and controls that are located in the same fixture or are controlling or controlled by the new components.**
- All projects must comply with all applicable Federal, State and local laws, codes and ordinances, including all building, energy and accessibility codes.
- All measures must be installed in a professional manner.
- **Ballasts that are taken out of use as a result of this project must be permanently removed from the fixtures. Do not leave them abandoned in place.**
- Old fixtures, ballasts and lamps must be removed from the project site and disposed of or recycled as mandated by Federal, State and local regulations. Include disposal and/or recycling costs in bid total.
- All fluorescent lamps must be disposed of according to the Universal Waste Rule regarding handling of Commercial Hazardous Waste. Disposal information can be found at <http://your.kingcounty.gov/solidwaste/takeitback/documents/TiBN-brochure.pdf>
- The Contractor should cover work areas and sensitive equipment, and clean up after install.
- The contractor is responsible for repairing any damage incurred during installation.
- All products must be installed per manufacturer recommendations and their installation must comply with provisions of all applicable Federal, State and local codes including the American Disabilities Act.
- City Light does not warrant the quality of the installed rebate measures. All materials and labor may be warranted by the installing contractor or manufacturer.
- All efforts shall be made to ensure appropriate illumination levels. The contractor should offer the owner the correct lamp wattage for the area to be illuminated, based on Illuminating Engineer Society (IES) recommended illumination levels.

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## 3. Fluorescent Lighting

### 3.1. Ballasts (Except Those Serving Compact Fluorescent Lamps)

All T8 and T5 ballasts shall meet ANSI C82.11 (High Frequency Fluorescent Lamp Ballasts) and UL 935 standards and bear the appropriate UL label. The following additional requirements (which are part of required criteria to obtain CEE listing) must also be met:

- All T8 ballasts must meet the Consortium for Energy Efficiency (CEE) specifications, and be found on the CEE list, for either the “Low Watt T8” or the “High Performance T8.” The CEE specifications and lists are available on the internet: <http://library.cee1.org/content/commercial-lighting-qualifying-products-lists>
- All T8 Ballasts controlled by occupancy sensors, local manual switch, or automatic daylighting controls shall be “Program Start.”
- The customer or contractor shall open fixtures during the Seattle City Light inspection so that the ballast manufacturer and model number can be positively identified.
- The power factor (PF), for 4-foot T8 & T5 shall be greater than or equal to 95%.
- Total harmonic distortion (THD) shall be less than or equal to 20%.
- The manufacturer shall provide written warranty against defects in material and workmanship, including replacement, for five years from date of manufacture.
- Ballasts shall be electronic.
- Ballasts shall have a Class A sound rating.
- Ballasts for T5 and T5HO lamps shall be "Program Start" (as defined in ANSI C82.11) and shall have end-of-life detection.
- Ballasts shall not contain PCB's.
- Ballasts shall be UL 935 listed, Class P, Type 1 Outdoor CSA Certified where applicable.

### 3.2. Lamps

- All T8 lamps must meet the CEE specifications, and be found on the CEE list for either the “Low Watt T8” or the “High Performance T8.” The CEE specifications and lists are available on the internet: <http://library.cee1.org/content/commercial-lighting-qualifying-products-lists>
- All lamps, ballasts and controls must meet all compatibility requirements of the lamp manufacturers and must provide full operability of all components without significant reduction in component service life due to incompatibility.

### 3.3. Ballasts (Serving Compact Fluorescent Lamps)

#### *For New Fixtures*

- Electronic ballasts covered by this specification shall withstand, without loss of performance, input power line transients as defined in ANSI C62.41 (High Frequency Fluorescent Lamp Ballasts).
- The lamps shall be detachable so they can be replaced without replacing the ballast.
- Ballasts with detachable lamps shall have end-of-life detection to prevent safety hazards.
- Total harmonic distortion (THD) of the input current shall not exceed 33% of the fundamental 60 Hz current.
- Electronic ballasts shall comply with FCC rules and regulations Part 18, concerning Electromagnetic & Radio Frequency Interference (EMI and RFI).
- Electronic ballasts shall meet ANSI C82.11 (High Frequency Fluorescent Lamp Ballasts).
- All equipment covered by this specification shall be Class "P" thermally protected where required by code.
- The ballast shall be capable of starting the designated lamp at the minimum temperature established by the lamp manufacturer.
- All ballasts shall be class "A" sound rated.
- Ballasts shall not contain PCBs.

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## ***For Screw-in Fluorescent Lamps/Ballast Combinations***

- All lamp/ballast combinations shall appear on the Energy Star Approved List:  
<http://www.energystar.gov/productfinder/product/certified-light-bulbs/results>

## **4. Light Emitting Diode (LED) Lamps & Fixtures**

### **4.1. General**

All LED light engines (combination of diodes, driver, heat sink, housing and optics), whether screw-in or hardwired, shall meet all of the following criteria:

- The rated driver input wattage and total number of LEDs shall be published by the manufacturer for each funded Fixture Unit (driver and LED combination) and shall be the same wattage used in the Fixture Counts Page of this Lighting Workbook.
- All equipment funded by Seattle City Light must have model-identification that is specific and clear enough to accurately match installed equipment with equipment submittals and specific product entries in the qualification lists referred to below.
- Equipment submittals for retrofits of existing fixtures must cover all components.
- LED Retrofit Kits (including linear lamp and driver) must be on one of the approved lists mentioned below under Section 4.2, and must carry a safety certification by an approved testing laboratory ( UL, CE, ETL, etc.).

### **4.2. Energy Star and Design Lights Consortium Lists**

LED lamps and fixtures that fall under an ***Energy Star*** or ***Design Lights Consortium (DLC)*** lighting product category must meet ***at least one of the following*** Measurement / Approval criteria as described below under sections 4.2.1, 4.2.2, or 4.2.3 to qualify for Seattle City Light Incentive funding. In general, integral lamps are more likely to fall under Energy Star, while fixtures are more likely to fall under Design Lights Consortium.

- 4.2.1 The product is approved and listed on the ***Energy Star Qualified Commercial LED Lighting List***  
For Lamps – (<http://www.energystar.gov/productfinder/product/certified-light-bulbs/results>)  
For Fixtures – (<http://www.energystar.gov/productfinder/product/certified-light-fixtures/results>)
- 4.2.2 The product is approved and listed on the ***Design Lights Consortium (DLC) List***  
(<http://www.designlights.org/QPL>)
- 4.2.3 If the product is not both approved and listed under either Energy Star or Design Lights Consortium, but falls under a category covered by one or the other, it will still be eligible for funding if it is on the ***Utility Qualified List*** (<https://www.lightingdesignlab.com/led-qualified-products-list-and-submission>). In order to get onto the ***Utility Qualified List***, submit the following test reports via the above website:
  - LM79 – This test report must come from a Nationally Recognized Testing Laboratory (NRTL).
  - LM80 – This test report usually is performed by the manufacturer but can be performed by an NRTL (if available).
  - In situ Report – This test report must come from an NRTL (if available).

The product will be placed on the ***Utility Qualified List*** if the submitted test reports indicate compliance with Energy Star or Design Lights Consortium requirements for the relevant category. This path is only intended to provide a short-term avenue to funding for equipment that is eligible to be placed on one of the other two lists.

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## 4.3. Linear, Tubular LEDs, and Linear, Tubular LED Fixtures

- Linear LEDs and Linear LED Fixtures are covered by the DLC List. They must meet the requirements stated under section 4.2.2, above.
- For retrofits that deliver line voltage to the sockets, replace the sockets.
- For retrofits that involve installation of lamps that run on fluorescent ballasts: Inspect all sockets and replace as needed.
- Retrofits: All abandoned components such as ballasts must be removed from the fixture.

## 4.4. Other

LED Lamps and LED Fixtures that do not fall under equipment categories covered by section 4.2 or section 4.3, above, will be considered by Seattle City Light on a case-by-case basis.

## 5. High-Intensity Discharge (HID) Fixtures

- Existing High Pressure Sodium and Metal Halide fixtures to be retrofit with Pulse-Start Metal Halide lamps and ballasts must be certified by the manufacturer to accommodate the new components.
- UL Recertification must be provided to SCL.

## 6. Bi-Level Lighting Fixtures Controlled by Integral Occupancy Sensors

- The equipment submittal provided to Seattle City Light must provide the fixture's rated input watts, for both the occupied and the unoccupied mode of operation.
- The lamps, fixtures, and ballasts, must also meet all other relevant sections of these specifications.
- The installed fixture must have an occupancy sensor control—integral to the fixture—that reduces the fixture light output automatically during unoccupied periods. The controls and ballast(s) must be placed in the fixture at the factory so that the fixture manufacturer is responsible for compatibility between occupancy sensor control and the ballast(s). A single ballast manufacturer and fixture model shall be used throughout the project.
- The fixture must have a UL rating.
- If the installed equipment will be in a stairwell, it must meet the minimum light-level requirement of the Seattle Fire Department, even when in "unoccupied" mode.
- Prior to receiving a Seattle City Light Agreement, customer must submit manufacturer's literature showing:
  - lamp rated watts
  - ballast rated input watts in occupied mode
  - ballast rated input watts in unoccupied mode
  - UL listing
  - proposed delay before going to "unoccupied" status after the space becomes unoccupied
- The "unoccupied" lighting level must be at least 10% of the "occupied" lighting level.

## 7. Exterior Lighting

- When replacing exterior fixtures, consider installation of shielded or partial/full cut-off fixtures to provide the most efficient lighting of the intended area.

## 8. Exit Signs

- Exit Signs shall be LED and shall use no more than 5 watts for the entire sign.
- Iridescent Exit Signs (signs that use no electricity) are not eligible for Seattle City Light funding.

## 9. Fixture Removal

- To receive funding for Fixture Removal, the fixture must be completely removed from the premises, and the electrical wiring to the fixture must be removed to the source junction box.

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## 10. Lamp Removal

- To receive funding for lamp removal, the ballast must be UL rated to operate safely and reliably with the remaining lamp configuration, as indicated by inclusion of that lamp configuration on the ballast label.

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