

**TECHNICAL SPECIFICATION 455
STREET LIGHTING SYSTEMS**

455.1 SCOPE OF WORK

This technical specification covers the furnishing of all labor, materials, testing, submittals, tools, and equipment necessary to install light distribution fixtures, poles, metered controller, concrete bases, wiring, and conduit of the type herein identified, complete and in place at the locations and to the dimensions and details shown on the plans or as directed by the Engineer. This work includes miscellaneous items necessary for a complete installation including excavation, backfilling, warning tapes, site restoration, etc. It also includes the coordination and costs associated with public utility work. This technical specification covers both decorative and commercial lighting systems. It is the intention of the Town to have consistency among the types of fixtures maintained by the community.

455.2 MATERIALS

A. Decorative Street Light Systems

1. Fixtures

The mainframe assembly shall consist of cast aluminum upper and lower cage frames welded securely to 4 slotted extruded aluminum cage legs to form a one piece assembly and secured internally to a ballast housing with four (4) ¼"-20 screws. (Product equivalent Hanover Lantern, Inc. Drawing No. L49561).

2. Lenses

The lenses shall be of a 0.125-inch thick clear polycarbonate.

3. Ballasts

The ballast housing shall be made of cast aluminum with a minimum wall thickness of 3/16 inches. The access door must have double concealed hinges and be secured by a tamperproof stainless steel screw. The ballast shall be 150-watt high pressure sodium. It shall be mounted on a slide tray which is equipped with a quick disconnect device and can be removed without the use of tools. Ballast shall be wired for 120 volts.

4. Light Distribution and Electrical Requirements

The fixture shall be wired for a maximum wattage of 150 high pressure sodium lamp type S-55 mogul base with a top mounted Type III distribution reflector (high pressure sodium lamp shall be provided). A #74 3/4 frosted glass chimney shall be placed in the fixtures base for decorative purposes.

5. Poles

The poles provided shall consist of one piece extruded aluminum castings constructed with a minimum wall thickness of 0.125 inches. Pole shall be 12'-0 1/4". The aluminum post shall be welded to an anchor base with four bolt openings. A large conduit opening shall be provided as well as a wiring access door. The access door shall be secured with four stainless steel screws. The poles shall be provided with four (4) 5/8 inch diameter by 18 inch long anchor bolts to be embedded a minimum of 16 inches into the concrete base. All bolts and screws to have anti-seize applied to threads. (Product equivalent Hanover Lantern, Inc. Drawing No. 316 - 7 Thru 18).

6. Exterior Finish

All fixtures and poles shall be cleaned and rinsed in a hot dip cleaning solvent or equivalent to remove all grease, dirt and blemishes before painting. The poles and fixtures shall be factory painted satin black.

7. Light Pole Bases

The light pole base(s) shall be a minimum of 4,000 PSI precast concrete as shown on the Town of Windsor Standard Details and shall include PVC conduit, pole fasteners and ground conduit. The top of the base shall be 15 inches square and taper to a minimum of 20 inches square at the bottom. The depth shall be 48 inches.

8. Metered Streetlight Controller

The electric service shall be 100 amp., I phase, 3 wire, 120V/240V. The controller assembly shall include the following:

1 EA	Meter Socket
1 EA	Main Circuit Breaker, 100 amp, 2 pole, General Electric Molded Case Model No. THQL 21100, or approved equal
1 EA	Circuit Breaker, 60 amp., 2 pole, General Electric Molded Case Model No. THQL 2160 or approved equal
1 EA	Contactor, electrically held, 60 amp 120v coil, 2 pole, Cutler-Hammer Model #C30 DN2-AB or approved equal

1 EA	Photocell, cabinet mounted 1800 watt, 120v
1 EA	GFCI Receptacle, 20 amp., 125 volt, in control panel
1 EA	Incandescent lamp holder with pull chain
1 EA	100 amp. main lug only, single phase, 12 circuit surface load center, General Electric Type TLM 1612C, or approved equal
1 EA	Timer, 60 minutes with hold feature, Intermatic Model No. FF60MH (serves as "on and off" test override switch), or approved equal

The controller shall have appropriate contactors, circuit breakers, grounding bars, wiring, and appurtenances for proper operation. An "on and off" override timer shall be provided for testing purposes. If the lights are off and the timer is placed in the "on" mode then the lights shall come on and override the photocell. The controller circuit panel shall contain a 20 amp., 125 volt GFCI receptacle and an incandescent lamp holder with a 60 watt lamp and a pull chain located in an upper quadrant of the panel. The controller is to be furnished with one lighting contactor controlled by the photocell.

9. Cabinet

The cabinet shall be a NEMA standard size M cabinet made of ¼ inch thick aluminum and shall have overall dimensions of 50 inches high by 30 inches wide by 18 inches deep unless otherwise approved by the Engineer. The cabinet finish shall be natural aluminum (unpainted). No auxiliary switch panel door shall be provided. The main door shall be equipped with a Corbin No. 1548-1 tumbler type lock (industry #2 lock) and two (2) keys shall be furnished to the Town.

10. Controller Base

The base shall conform to the drawings as shown on the Town of Windsor Standard Details. The base shall be made of Class "C" concrete and may be precast. It shall include one (1) dedicated 2 inch PVC electrical grade conduit sweep for the utility company power feed, one 5/8 inch by 8 foot copper ground rod, a minimum of 4-2 inch polyvinyl chloride sweeps for wiring to the light poles, and 2-3/4 by 18 inch galvanized anchor bolts.

11. Conduit and Wiring

Conduit shall be 2 inch, schedule 40 PVC electrical grade conduit. Wiring shall consist of 3-1/0 THW aluminum wire, and a #6 copper ground unless otherwise approved by the Engineer.

B. Commercial Street Light Systems

The commercial light standards and luminaire shall conform to Form 816, Sections M15.01 through M15.05, with the following exceptions:

1. The Commercial Luminaire shall be of a GE type M-250A2 POWR/DOOR® Luminaire With Cutoff Optics or approved equal.
2. Mounting height of light fixtures shall be 32'-6" feet above grade.
3. On commercial lighting systems, contactor number one is to control even numbered light poles and contactor number two is to control odd numbered light poles. A separate 2 pole, 60 amp circuit breaker, shall power each contactor. The normal operation of all lights is to be controlled by the photocell.
4. Cabinet and Controller Base shall meet the above requirements of Section 455.2.A.9 and 455.2.A.10 unless otherwise approved by the Engineer.

455.3 SUBMITTALS

The following submittals shall be submitted to the Engineer for review and approval prior to installation:

- Manufacturer(s) cut sheet(s) on fixtures
- Manufacturer(s) cut sheet(s) on light poles
- Manufacturer(s) cut sheet(s) on light pole bases
- Manufacturer(s) cut sheet(s) on controller cabinet
- Manufacturer(s) cut sheet(s) on controller base

455.4 CONSTRUCTION METHODS

A. Decorative Street Light Systems

1. Cabinet

A 3/4-inch black plywood backboard shall be mounted on the inside back wall of the cabinet and shall serve as the main panel for the mounting of controller components. The photocell shall be installed on the upper portion of the cabinet. The photocell shall be mounted so that the cabinet retains its weatherproof characteristics around the mounting area. A utility company approved meter socket shall be mounted on the right side of the cabinet when viewed from the front. A dedicated 2 inch PVC pipe shall run from the concrete cabinet base outside the cabinet to the meter socket for the utility company service wires.

2. Light Pole and Controller Bases

The Contractor shall install and level the bases as shown on the plans. The bases shall be set on 8 inches of compacted processed aggregate on a stable prepared subgrade.

3. Conduit and Wiring

Conduit shall be installed a minimum of 24 inches below grade. Conduit shall be connected with approved couplings to the base sleeves incorporated within the light pole bases. Electrical wiring will extend through the bases for connection to each pole. The work shall include all excavation, backfill, materials, labor and surface restoration, including loaming and seeding, and temporary and permanent pavement replacement. Where such surface restoration is required, all work shall be performed in accordance with the Town Standards. Warning tape shall be installed a minimum of 1 foot above all electrical conduit. Standoffs shall be used in accordance with the serving public utility company or as directed. The Contractor shall also supply and install all items necessary to insure proper functioning of the lighting system, including photocell(s), ground wire to be made to the ground lug in the pole base as shown on the electrical diagram, inline fuses and holders, non-delay 5 amp 300 volt capacity for each pole, and appropriate connectors, miscellaneous wiring and appurtenant items.

4. Metered Streetlight Controller

All construction methods for this item shall be in accordance with the manufacturer's construction methods and the National Electrical Code (NEC). Each street light controller installation shall be located and mounted as directed by the Engineer or as shown on the plans.

B. Commercial Street Light Systems

The installation of commercial street light systems shall conform to Form 816, Sections 10.03, 10.04, and 10.08. The installation of the cabinet shall conform to the above 455.4.A.1. All other installation shall conform to applicable AASHTO, CT DOT, and NEC standards.

C. Public Utility Work

Where public utility work is required, the Contractor shall make arrangements to ensure proper coordination of work. If required, the Contractor shall provide all excavation, backfilling of service conduit, labor, surface restoration and any appurtenant work, from the power source to the service meter necessary for receiving electrical service as described. Cost of this work shall be included in the lump sum price for the controller.

455.5 MEASUREMENT

Measurement for light poles, fixtures, controllers and bases, will be based on the number of poles, fixtures, controllers, and bases of the type specified, completed and in place.

Measurement for conduit and wiring will be based on the number of linear feet of conduit and wiring installed and completed.

455.6 PAYMENT

Payment for this item will be at the contract unit prices per Each for decorative and commercial light poles, fixtures, controllers and bases and per Linear Foot for conduit and wiring, completed and accepted in place including all labor, materials, testing, submittals, tools, and equipment necessary to complete the work as specified.

PAY ITEM	PAY UNIT
Decorative Light Pole and Base	EA
Commercial Light Pole and Base	EA
Conduit	L.F.
Wiring	L.F.
Controller and Base	EA