



7 Street Lighting Construction Standards

7.1 General

- A. Main line electric, telephone, cable and fire alarm shall be meet the material and installation requirements of the respective utility owner. Secondary electric, telephone, cable television and fire alarm lines shall be placed in the grass strip or sidewalk inside the proposed public right of way, but outside of the traveled way on the opposite side of the centerline of the street as the water main. Conduit runs and handholes for street lights shall be placed in the sidewalk or grass areas abutting the roadway. Service pedestals and their connections shall be located on private property with easements.
- B. References in this section to the "Standard Specifications" shall mean MassDOT's Highway Division Standard Specifications for Highways and Bridges dated 1988, and all Supplemental and amended Specifications.
- C. All materials and work shall be designed to meet all requirements of the latest edition of the National Electric Code (NEC), and all local codes.
- D. All street lighting materials and their installation shall fully meet the requirements of Eversource and be accepted by Eversource prior to the City accepting these facilities. Street light standard locations are subject to review by the City's DPW and Eversource (Electric) prior to their installation.
- E. Wiring and connections shall be tested for continuity and ground before service conductors are connected and shall demonstrate insulation resistance by megger test as required at not less than 500 volts. Insulation resistance between conductors and grounds for secondary distribution systems shall meet National Electrical Code (NEC) requirements
- F. Submittals required for street lighting projects include:
 - 1. Materials List and Shop Drawings
 - 2. As-built Plans
 - 3. Recorded easements

7.2 Conduit

- A. Conduit material for street lighting shall be Schedule 40 Polyvinyl Chloride (PVC) plastic and shall meet the requirements of UL 651, NEMA TC-2 and Eversource.
- B. Conduit for the service connection from the Eversource system to the street lighting service pedestal shall be 2-inch in size. A spare 2-inch conduit shall also be provided for future use.
- C. Conduit from service pedestal to street lights shall be 2 inches in size.
- D. Conduits between street lights must run from handhole to handhole with laterals to street lights.
- E. Minimum depth of conduits for street lighting shall be 2'-0" as measured from the finish grade. Conduit shall be deeper as necessary to avoid conflicts with other utilities.
- F. All street lighting conduits shall be encased in 2,500 PSI, ¼-inch AGG cement concrete as shown in detail, whether in the public right of way or within easements on private property.



7.3 Handhole

- A. Electrical handholes for street lighting shall be open bottom, precast polymer units. They shall have minimum nominal dimensions of 13-inch wide x 24-inch long x 18-inch deep and arranged for bottom conduit entry and include grounding rod and ground conductor. They shall be Quazite #PG1324BB18 or approved equal.
- B. Handhole covers shall be bolt down type and labeled with notation to read "Street Lighting". Handholes shall be heavy duty type and rated for installation adjacent to traffic areas. They shall be Quazite #PG1324WA41 or approved equal.
- C. Handhole covers shall be set flush with the top of sidewalk and shall be positioned no closer than 12 inches to the edge of the concrete sidewalk.

7.4 Light Standard Foundation

- A. Street light standard foundations shall be constructed per the Standard Specifications and details. Any deviations must be submitted to the City for approval.
- B. Cylindrical foundations shall be as specified by lighting manufacture, including number, type and location of anchor bolts. Pre Cast foundations shall be made of minimum 5,000 psi concrete (at 28 days) and have steel reinforcement meeting ASTM A-615, grade 60 (cover to steel, 1-inch minimum). Foundations shall have a minimum of two (2) 2-inch PVC conduits for lighting circuits, 180 degrees apart.
- C. Foundations are to be installed flush with finished grade in sidewalk areas and 3 inches above finished grade in grass areas. Anchor bolts to be ¾-inch diameter by 30-inch long "j-hook" type galvanized steel (4 per foundation) or as otherwise required by the manufacturer.
- D. Foundations shall be provided with 2-inch galvanized rigid metal conduit in foundation and coupling and 2-inch plastic type NM conduit stub out to adjacent handhole.

7.5 Wire & Splicing

- A. Conductors shall be No. 12 through No. 8 AWG, NEC type THWN/THHN, meeting the requirements of UL 83. Conductors for power and lighting shall be no smaller than No. 12 AWG. Electrical wire shall have XHHW insulation.
- B. All conductors shall be annealed copper, 98% conductivity, Class B stranded, except conductors used for power and lighting circuits No. 10 AWG and smaller which may be solid. All conductors should be rated for 600 volts or less, with a thermal rating of 90° C.
- C. The outside covering of all wiring for power, lighting, grounding, and control uses shall be color coded to identify polarity.
- D. Conductors shall be joined in handholes using back to back copper compression type single barrels lugs joined using durium bronze hardware and insulated using a Raychem Gel Cap water resistant stub splice cover as detailed.

7.6 Service Connection Underground

- A. Electric service shall be coordinated with and conform to all current policies of the electric utility company.
- B. Service connection shall include a three-wire single phase solid neutral service conductors, conduits, conduit riser or connection to utility company pad mounted transformer; all installed in



accordance with the Code and utility company. Meter shall be furnished and installed by the utility company.

7.7 Service Pedestal

- A. Enclosure: Enclosure shall be a NEMA 3R rated UL: listed convection ventilated and consist of a cabinet and a gasketed door assembly, constructed from 5052-h32 sheet aluminum alloy (less than 0.02% copper) of at least 1/8-inch thickness. The enclosure shall be free of dents, cracks and other imperfections and shall be mounted on a concrete base.
- B. Enclosure shall be provided with two (2) adjustable "c" mounting channels on both side walls and back wall of the enclosure and an aluminum back panel. Enclosure shall be CP3A Slimline series as manufactured by MILBANK, or approved equal. The construction features and details shall comply with the manufacturer's requirements.
- C. Panel board: The branch circuit breakers frame shall be rated 100 amperes with a UL listed interrupting rating of 18,000 amperes symmetrical at 240 volts.16 circuit.
- D. Receptacle: Receptacle shall be a specification grade NEMA 5-20R ground fault circuit interrupter type and stainless steel cover in a surface utility outlet box. Receptacle shall be manufactured by Hubbell, Leviton or Bryant.
- E. Switch and Lighting Fixture: Switch shall be specification grade 120/277VAC 20amp switch and stainless steel cover in a utility outlet box. Lighting fixture shall be a surface mount LED.
- F. Meter Socket: Meter socket shall be utility company approved UL listed 100 amp 240/120V 1 phase 3 wire outdoor type. Number of terminals, bypass release and other features shall be provided as to match utility meter.
- G. Grounding Electrode: Grounding electrodes shall be 3/4-inch diameter by 8-foot long copperweld rods. Rods shall be driven vertically. Coordinate with all existing conditions and follow "call before dig" procedures prior to driving the rods.
- H. Location and orientation of the street lighting service pedestal shall be such as to ensure easy access to the cabinet for maintenance as well as to provide protection from damage including snow removal. The location shall not prohibit pedestrian travel. The location of pedestal shall be approved by the City Department of Public Works in advance of placement.
- I. All branch circuitry originating from the cabinet shall be routed directly into the circuit breakers. Two (2) -2-inch stub outs shall be provided to street lighting handhole below grade. One active and one for future use.
- J. Cabinet shall be installed per manufacturer's requirements for a level and plumb installation. Provide touched up finish paint, as required for any blemishes.
- K. Ground all systems and equipment in accordance with best industry practice and herein stated requirements.

7.8 Street Light Pole & Luminaire

- A. Light Pole shall be manufactured by P&K Tubular Products Madison Series Cat. NO. RFT6M14MYS - 12 flute cross section with 3 1/2-inch OD tenon BLACK and Madison BLACK decorative base.



- B. Anchor bolts shall be supplied by the pole. Anchor bolt shall be completely hot-dip galvanized. Each anchor bolt shall have a hex nut, flat washers and lock washer. The anchor base shall conform to ASTM A36. Bolt circle diameter and length shall be per pole manufacturer's requirements.

- C. Luminaire shall employ white, long life LED type lamps and IES Type III asymmetrical light distribution with cutoff vertical control to minimize uplight. Luminaire shall be King Luminaire K199 Series Cat. NO. K199R-B2AR-III-100(SSL)-1063-120:277-K18-SST-PEC-GFI-3K-BLACK - (100 WATTS - 7,157 LMS).