

80 ELECTRICAL WORK: ITEM 618 002

This S.P. revises and supplements 618 and 621 of the DC Standard Specifications.

(A) DESCRIPTION

Furnish and install conduits, manholes, junction boxes, underpass luminaires, photo controls, feeder cables, control cabinets, electrical splices and all other essentials necessary for the satisfactory installation of the trail lighting system shown on the Contract Drawings, whether specifically mentioned or not.

Furnish and install systems to control the proposed lights on the trail that will allow the lights to turn off at 10:15 p.m. and turn on again at 6:00 a.m.

The Potomac Electric Power Company (PEPCO) currently supplies power to the existing streetlight system in the project area from its manholes. PEPCO will supply the power to the trail lighting system. The Contractor shall install the new feeder cables shown on the Contract Drawings into PEPCO's facilities, under PEPCO's supervision and inspection.

The Contractor shall cut the District's existing cables supplying power to the existing streetlight system when required to make new connections in PEPCO owned manholes. All such existing cables cut by the Contractor shall be reconnected within 24 hours at the Contractor's sole expense, unless the streetlights being fed by those cables are being permanently removed as part of this project. PEPCO owns the service tap onto their electrical system. The District owns the cables between the service tap and the street lights.

All new service taps onto PEPCO's electrical distribution system will be performed by PEPCO forces. The Contractor shall coordinate with PEPCO forces to facilitate these service connections.

(B) GENERAL REQUIREMENTS

Before any electrical work is performed, the Electrical Contractor must be licensed and bonded in the District of Columbia and shall apply for an electrical permit to perform electrical work in public space. This application shall be signed by a Master Electrician or Electrical Engineer who is required to be licensed in the District of Columbia.

The Contractor's employees installing the electrical work shall be licensed in the District of Columbia as a Master Electrician, Electrician or Apprentice Electrician. When Apprentice Electricians are working, a Master Electrician or an Electrician must be on the project site for personal supervision.

The Contractor shall have a copy of the Drawings, Electrical Permit and all approved Catalog Cuts on the job at all times when electrical work is being performed.

All electrical work shall be inspected by the electrical inspectors of the District Department of Transportation. Forty-eight (48) hour advance notice is required for inspection.

Violation of any electrical code, the Special Provision, Standard Specifications for Highways and Structures (2009) or any other requirements will cause the work to be **STOPPED IMMEDIATELY**. It should be noted that the District's electrical system is unfused, unprotected with no disconnecting means other than cutting the cable from the feed source.

The Contractor shall be expected to perform electrical work on the District's cables with the knowledge that the circuits are energized.

The Contractor upon completion of the project shall submit a complete set of as-built drawings of the trail lighting portion of the project to the Streetlight Section, District Department of Transportation.

The set of drawings shall bear the signature of an officer of the Contractor's organization, certifying compliance with as-built conditions.

(C) PEPCO SERVICE

The Potomac Electric Power Company (PEPCO) will furnish power for the trail lighting systems. All work involved with PEPCO facilities shall be performed in conformance with PEPCO requirements. The Contractor shall install the new feeder cables into PEPCO's facilities, under PEPCO's supervision and inspection.

It shall be the Contractor's responsibility to notify and coordinate with PEPCO throughout the construction of the project in connection with all PEPCO services and facilities in the construction area, such that removal and restoration of services can be done in a timely and orderly manner at all times. Construction delays as a result of inadequate coordination shall be the Contractor's responsibility. The Contractor shall coordinate with PEPCO for the following:

1. Payment to PEPCO for manhole entry before any entry into their manholes.
2. Payment to PEPCO for any PEPCO forces work (SLF – Work Orders).
 - a. Pepco number for the proposed DDOT lighting connection point on New York Ave is **SLF#11119-C**.
3. To have each "PEPCO MANHOLE" inspected by PEPCO forces and the Electrical Contractor on this contract for safety, clearing of the cables racked on the walls, spotting of the wall for new conduit penetrations and the knowledge of the location of each feed manhole for the street lights.
4. Calling PEPCO when it is necessary for PEPCO forces to make the taps onto their Electrical System to energize the street lighting and signal systems.
5. Calling PEPCO for the final inspection of their manholes after all electrical work is complete in the PEPCO manholes as called for in this contract.

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All work performed within PEPCO facilities shall be performed in conformance with all PEPCO requirements. The Contractor shall initiate communication with PEPCO as early as possible after execution of this contract for the purpose of establishing scheduling guidelines and to exchange telephone numbers between the principal points of contract. The power company representative is:

Rafael Melendez
3400 Benning Road, NE
Washington, DC 20019-1599
rmelendez@pepco.com
202-388-2024

(D) MATERIAL AND WORK PROCEDURES

Unless otherwise noted in the Contract Drawings and this Special Provision, the Contractor shall be responsible for furnishing all proposed materials associated with the electrical work. All electrical work and materials used in this project shall meet the requirements of the pertinent section of the latest edition of the National Electric Code (NEC) or the District of Columbia Electrical Code.

The Contractor shall be responsible for submitting catalog cuts and/or samples of all materials to be furnished for street lighting work to the Infrastructure Project Management Administration (IPMA). Procurement of all such materials by the Contractor may not begin until written approval is obtained from the Engineer.

PAVEMENT RESTORATION

As directed by the Engineer for temporary pavement restoration, the trench shall be backfilled to the bottom of the existing pavement surface. The Contractor shall apply a temporary patch over the backfill until such time as final restoration can be completed.

CONCRETE ENCASEMENT

PCC mix design for encased conduits shall conform 817.03 for Class F General Use, minimum 28-day compressive strength of 3,500 psi on field test cylinders made in the field and cured in laboratory. All conduit shall be encased to provide a four (4) inch minimum cover all around the conduit.

If existing utilities or conduits are present in the trench, these utilities or conduits shall be surrounded with an encasement of at least three (3) inches of sandy fill, free from objects, which might damage the conduit. PCC encasement shall then be placed over the sand encasement to the appropriate level.

CONDUITS

Conduits shall conform to the requirements of these Special Provisions. Conduit shall be in factory-supplied lengths and shall be marked with the manufacturer's name, trade name, or trademark, nominal trade size, and type of material. All joints shall be water-tight. Solvent cement used for joining PVC conduit shall conform to the requirements of ASTM D2564.

All bends shall be of long sweep, free of kinks and of such easy curvature as to permit cable pulling without undue tension on conductors or damage to insulation.

The proposed conduit runs, as shown on the Contract Drawings, may be revised to avoid underground obstructions only with written approval by the Engineer.

Unless otherwise shown, conduits shall be placed a minimum depth of thirty-six (36) inches below final grade, or at greater depths if required to obtain the necessary utility clearance, and shall slope at a minimum rate of three (3) inches per one-hundred (100) feet of length to a foundation, or manhole.

All conduit fittings shall be free from burrs and rough places, and all conduit runs shall be cleaned and swabbed before cables are installed. Cut conduits shall be reamed before fittings and cables are installed.

Standard manufactured elbows, bushings, reducers, bends couplings, etc. of the same materials as the straight conduit pipe shall be used, as required throughout the conduit system. The conduits on the bridge and boardwalk structures shall be installed with expansion-deflection fittings at joints on the structures where required per the NEC or where shown on the Contract Drawings.

There may be instances throughout this project where the Contractor will be required to build conduit to intercept existing PEPCO manholes. In such instances, the Contractor shall be required to coordinate penetration of existing manholes with the Potomac Electric Power Company so as to avoid disruption to PEPCO facilities.

SPLICES

At a location approved by the Chief Engineer, a splice may be permitted. The splice shall meet the requirements of the National Electric Code (NEC) and any additional requirements of the District of Columbia Electrical Code, latest edition. Splices in wires and cables shall be accomplished by means of compression-pressure connections. The connectors shall be suitable for the size wire used and shall be of one-piece tubular tinned copper or bolted type copper construction. The indenture shall be such as to assure maximum electrical connection and sufficient physical strength. The connection shall be covered with cross-linked polyolefin shrinkable tubing. The tubing shall be heavy wall rated 600 V 90C and conform to UL 486D, CSA C22.2 No. 198.2 and ANSI C119.1 and Western Underground Guides 2.4, 2.5. If shrinkable tubing is not feasible for a particular connection, the connection shall be covered with Super 88 Scotch plastic electric tape manufactured by Minnesota Mining and Manufacturing Company, or type CW as manufactured by Plymouth Manufacturing Company or other approved equal half-lapped into a thickness not less than 50 percent greater than the conductor insulation. An approved waterproof coating shall be applied on the outer cover. Wires shall be tagged as specified in 621.13.

CIRCUIT IDENTIFICATION

The Contractor shall furnish and install identifying tags on all circuit cables, in all junction boxes for line and luminaire identification. Tags shall be as per 820.14. Identification markings, designated by the Engineer, shall be stamped on the tags by means of small tool dies. Each tag shall be securely tied to the proper conductor by non-metallic core plastic. Self-adhesive plastic tags shall not be used unless approved by the Engineer.

GROUNDING AND BONDING

One solid copper ground rod shall be installed in each manhole, lighting cabinet and twenty (20) foot steel pole with photocell, as shown on the Contract Drawings. The grounding electrode conductor shall be sized accordance with the National Electric Code. The ground wire shall be installed with other conductors when they were pulled. Grounding shall be accomplished as soon as materials are in place to which the grounding wires are to be attached.

The superstructure steel shall be thoroughly grounded with a bare copper wire, standard soft drawn, size as noted and braced to the structure and connected to ground rods as shown on the plans. The superstructure ground and bonding jumper copper wire, suitably looped, shall be installed to allow for expansion movement of the girders.

Material used for installation of grounding systems shall meet the following requirements:

1. Ground Clamps - Shall be heavy-duty bronze, brass or galvanized malleable iron conforming to the requirements of ASTM A220, any grade.
2. All manhole ground rod connections shall be made using exothermic welding.

The Contractor shall in each District-owned manhole bond the neutral conductor and the system ground wire to the manhole grounding electrode.

Any District-owned manhole that is worked in under this contract will be checked to affirm the existence of ground rod; if no ground rod is found, a ground rod shall be installed through the floor of the manhole in such a way as to have a minimum soil contact of eight (8) foot. The diameter of the ground rod shall be 3/4-inch diameter. The Contractor shall make the electrical connections between the GROUND ROD-NEUTRAL CONDUCTOR AND ANY GROUND WIRES using exothermic welds in the existing DC manholes.

ELECTRICAL TESTS

Applicable test shall be performed in accordance with 621.16. All equipment used for testing shall be tested and certified by an approved testing lab and copies of the certifications shall be provided to the Project Engineer before any testing is done. Defects in materials or workmanship in the installation as disclosed by the test shall be corrected or replaced by the Contractor without additional compensation. A written report on all tests completed shall be submitted to the Project Engineer for approval. ALL GROUND RODS SHALL BE TESTED AND APPROVED.