SECTION S671 - STREET LIGHTING

S671-1 DESCRIPTION

Work consists of installing, adjusting, relocating or replacing street lighting appurtenances as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addendums.

S671-2 MATERIALS

S671-2.01 Conduit and Cable

A. Conduit - General

Conduit, couplings, condulets, adaptors and bends are to be Schedule 40, rigid, extra-heavy wall polyvinyl chloride (PVC) as specified by and in accordance with Underwriters Laboratories Standard UL-651 and NEMA Standard Specification TC-2 for electrical plastic conduit EPC-40.

Conduit, couplings, condulets, adaptors and bends used for roadway crossings and wood pole riser connections, are to be Schedule 80, rigid, extra-heavy wall polyvinyl chloride (PVC) conduit as specified by and in accordance with Underwriters Laboratories Standard UL-651 NEMA Standard Specification TC-2 for electrical plastic conduit EPC-80.

Solvent cement for joining PVC conduit is to be in accordance with ASTM D2564, or as recommended by conduit manufacturer.

Galvanized steel conduit, couplings, condulets, adaptors and bends are to be in accordance with NYSDOT Section 723-20 Metal Steel Conduit, Zinc Coated.

In cases of conflicting test requirements, more stringent of test requirements will be required.

B. Conduit – 1-1/2 inch

Conduit, couplings, condulets, adaptors and bends are to be in accordance with or exceed ASTM D3350, UV Black (minimum carbon black loading of 2 percent), as tested and listed by Intertek Laboratories (ETL) to assure compliance with and that conduit is in accordance with Underwriters Laboratories Standard UL-651A. Conduit sequential footage markings are to be permanent ink jet or indent print

C. Cable in Conduit

Cable in conduit is to be single conductor No. 6 AWG stranded copper conductor, type THWN color coded, and continuously colored red/white/black. Cable is to be flame-retardant, moisture and heat resistant, with thermoplastic insulation and nylon jacket. Cable is to be approved for use in wet or dry locations, and up to temperature of 170°F. Number and color of cables will be as required by schematic drawings.

D. Cable in Pole

Cable in pole is to be single conductor No. 10 AWG stranded copper conductor, type THWN color coded, and continuously colored white/black. Cables are to be flame-retardant, moisture and heat resistant, with thermoplastic insulation and nylon jacket. Cables are to be approved for use in wet or dry locations, and up to temperature of 170°F. Number and color of cables will be as required by schematic drawings

E. Miscellaneous Hardware

Bolt connector is to be Burndy split bolt connector catalog number KS20, or approved equivalent.

Threaded 3 inch coupling and nipple are to be 50,000 pounds per square inch galvanized steel in accordance with ASTM A449.

Threaded 2 inch coupling and nipple are to be 36,000 pounds per square inch galvanized steel in accordance with ASTM A153.

Ground rod is to be 5/8 inch diameter, 8 foot long, copper bonded or hot dip galvanized steel.

Ground rod clamp is to be 5/8 inch Anderson GC-5, Blackburn J-AB 5/8 H, or approved equivalent.

S671-2.02 Warning Tape

Warning tape is to be red and marked CAUTION ELECTRICAL CABLE as manufactured by Allen System, Inc., or approved equivalent.

S671-2.03 Concrete Pullbox

Precast or cast-in-place pullboxes are to be made from Class K concrete, with cable bracket supports attached on inside of all four walls. Iron castings for frames and covers are to be in accordance with ASTM A48 Class 30 gray iron.

S671-2.04 Pole Foundation

Pole foundations are to be made of Class K concrete.

Pole foundations for fiberglass and non-davit style light poles are to be precast. Cast-in-place foundations will be allowed only as approved of by Project Manager.

Pole foundations for davit style light poles are to be cast-in-place. Precast foundations will be allowed only as approved of by Project Manager.

S671-2.05 Materials Furnished by City

City will provide following materials for installation by Contractor:

- Anchor bolts, nuts and washers
- Fiberglass handhole/pullbox
- Fiberglass handhole/pullbox steel rim and cover
- Concrete pole
- Ornamental luminaire, complete with lamp

Furnished materials are to be picked up from Water Bureau Materials and Equipment Stockroom, 401 Dewey Avenue, Rochester, New York, Monday through Friday, between hours of 8:00AM and 2:00PM, exclusive of holidays. City Street Lighting Section requires minimum of 2 working days advance notice to make arrangements for pick up of furnished materials, (585) 428-1297.

Inspect all furnished materials before accepting delivery to ensure that there are no obvious defectives.

S671-2.06 Slurry Bond Coat

Slurry bond coat is to be Acryl 60 as manufactured by Thoro System Products, or approved equivalent.

S671-2.07 Grout

Grout is to in accordance with NYSDOT Section 701-05 Concrete Grouting Material.

S671-2.08 Concrete

Concrete is to be Class K in accordance with Section S504 Portland Cement Concrete.

S671-2.09 Subbase Course Material

Subbase course materials are to be Type 1 and 2 in accordance with NYSDOT Section 304 Subbase Course.

S671-2.10 Sand

Sand is to be clean washed well graded angular sand with maximum particle size of about 3/16 inch, without any fine limestone screenings, free of salts and other deleterious materials, and in accordance with requirements of ASTM C33 Concrete Aggregates.

S671-2.11 Select Backfill

Select backfill can be any locally excavated material that is free from stones, sod and foreign materials. If suitable or sufficient quantities of excavated materials are not available, provide select granular fill in accordance with Section R203 Excavation and Embankment.

S671-2.12 Excavation, Backfill and Surface Restoration

Excavation, backfill and surface restoration is to be in accordance with:

- Section S203 Excavation and Embankment
- Section R206 Trench and Culvert Excavation
- Section S608 Sidewalk and Driveway
- Section S610 Landscape
- Section S613 Topsoil
- NYSDOT Section 203 Excavation and Embankment
- NYSDOT Section 304 Subbase Course

Pavement restoration materials are to be in accordance with:

- Section S407 Tack Coat - diluted or straight tack coat
- NYSDOT Section 304 Subbase Course - subbase course Type 1 and Type 2
- NYSDOT Section 402 Hot Mix Asphalt (HMA) Pavements -
  9.5 F2 top course HMA 80 series compaction
  19 F9 binder course HMA 80 series compaction
  37.5 F9 base course HMA 80 series compaction
- NYSDOT Section 503 Portland Cement Concrete Foundation for Pavement - concrete foundation for pavement, Class C

S671-2.13 Materials to be UL Listed

All material required for work is to be listed and rated by Underwriter Laboratories (UL) for its designated use. Materials are to be delivered to job site in original packaging, clearly labeled and bearing manufacturer's identification and UL label.

S671-3 CONSTRUCTION DETAILS

S671-3.01 General

Manufacturer's shop drawings are to be submitted as required in General Terms and Conditions Article 6, Section 6.13 Shop Drawings and Samples.

Removal and reinstallation of existing cable, light poles, luminaires and all other related appurtenances will be done by City's Street Lighting Term Contractor, unless otherwise noted. Where such work is required, Project Manager is to be notified minimum of 2 working days in advance of Contractor's intent to begin work on street lighting facilities. Contractor is to coordinate work with City's Street Lighting Term Contractor, and will not be held liable or responsible for any delays in performing work that are caused by City's Street Lighting Term Contractor's lack of responsiveness or failure to proceed expeditiously.

Pole foundation installation, relocation and/or adjustment, is to result in completed foundation with smooth level surface, so that light pole is plumb when installed.

Split duct repairs on conduits are not allowed.

Removal and reinstallation of existing traffic signage that is located on light pole is to be done in accordance with NYSDOT Section 619 Work Zone Traffic Control, or work will be done by others.

Excavation, backfill and surface restoration is to be in accordance with Construction Details for:

- Section S203 Excavation and Embankment
- Section R206 Trench and Culvert Excavation
- Section S608 Sidewalk and Driveway
- Section S610 Landscape
- Section S613 Topsoil
- NYSDOT Section 203 Excavation and Embankment
- NYSDOT Section 304 Subbase Course

Pavement restoration materials are to be in accordance with Construction Details for::

- Section S407 Tack Coat.
- NYSDOT Section 304 Subbase Course
- NYSDOT Section 402 Hot Mix Asphalt (HMA) Pavements
- NYSDOT Section 503 Portland Cement Concrete Foundation for Pavement

S671-3.02 Salvage of Existing Items

Existing items that are to be salvaged may be stock piled on-site until sufficient quantity has accumulated to make delivery feasible. After removal, existing items are to be stored at location that is safe and secure from damage by Contractor's ongoing operations, and from vandalism, theft or other mishap, until delivery can be made to City. Salvaged items are to be placed on level ground to provide even bearing for salvaged item.

Salvaged items are to be delivered to Water Bureau Materials and Equipment Stockroom, 401 Dewey Avenue, Rochester, New York, Monday through Friday, between hours of 8:00AM and 2:00PM, exclusive of holidays. City Street Lighting Section requires minimum of 2 working days advance notice to make arrangements for delivery of salvaged materials, (585) 428-1297.

S671-3.03 Tree Protection

Existing trees and tree roots within project limits are to be protected from damage by construction activities. Construction or excavated materials are not to be placed or stockpiled within limits of canopy of any existing tree, to prevent smothering of existing tree root system. Vehicles and other construction equipment are not to be parked on any tree root system, nor left running (idling) under limits of canopy of any existing tree.

Where cutting of existing tree roots is necessary, it is to be done with sharp cutting tools. Exposed tree roots are to be re-buried as soon as possible. Until exposed tree roots can be re-buried, exposed tree roots are to be covered with wet burlap. Burlap is to be kept wet until exposed tree roots can be re-buried.

Existing trees that are damaged by construction activities are to be repaired within 72 hours using current arboricultural standards. Those existing trees that are determined by City Forester to be damaged beyond repair, are to be removed and replaced by Contractor.

S671-3.04 Conduit - General

A. <u>General</u>

Conduit may be installed by either directional boring, within existing duct pathway, open trenching, or any combination thereof.

Preferred method for conduit installation is directional boring, with open trenching being allowed only if approved of by Project Manager.

Conduit installation under driveways, sidewalks and trees must be done only by directional boring.

Minimum depth of conduit between top of conduit and finished grade is to be 3 feet in roadway area, and 2 feet in all other areas.

Conduit is to extend between all pole foundations, direct embedded poles, pullboxes, handholes and electrical service points. Conduit is to be connected to all pole foundations, direct burial poles, and City handholes/pullboxes, but not to private utility manhole/handhole.

Conduit connected to concrete pullboxes is to be installed flush with inside wall, and minimum of 3 inches above floor of pullbox.

Where open trenching is used, warning tape is to be placed in open trench approximately 6 inches above conduit.

Individual conduit sections and fittings are to be assembled in accordance with manufacturer's instructions to form continuous conduit run.

After installation, conduit is to be tested for clear bore and correct installation by using mandrel, brush and snake, before installation will be accepted. Mandrel assembly is to include two short brushes. Mandrel is to be turned approximately 85 percent of internal diameter of conduit to be tested. Snaking of conduit is to be done in presence of Project Manager. Conduit which rejects mandrel is to be cleared at once, replace any defective conduit.

After testing is complete and installation accepted, install 250 pound nylon pull cord in empty conduit, and cap or plug all openings.

B. Roadway

Conduit sections installed under roadways are to extend to minimum of 1 foot behind face of curb, or back edge of concrete gutter, on both sides of roadway; or from exterior of pole foundation or direct embedded pole located on one side of roadway, to handhole, pullbox, manhole, or wood pole riser connection located on opposite side of roadway.

PVC conduit in open trench roadway crossings is to be encased within minimum of 3 inches of concrete, with backfilling of trench not being allowed until concrete has set.

C. Existing Duct Pathway

Conduit to be installed within existing duct pathway will be of size required in Contract Documents. Existing duct may consist of old pump log, larger size PVC conduit, or metal conduit.

If existing duct is still occupied with cable, existing cable is to be removed and properly disposed of.

Where sections of existing duct pathway are blocked and cannot be cleared, area is to be bypassed, which may require open trenching.

D. Conduit Replacement

Section of existing conduit to be replaced is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, section of conduit is to be removed and disposed of, and new conduit installed.

S671-3.05 Conduit Connection to Service Points

Conduit is to be extended to designated point of service, and connected in accordance with following methods:

A. Underground Supplied Fixture Fed from Underground Distribution Facilities

Conduit is to be extended from City's handhole/pullbox to private utility manhole/handhole, but not connected. Private utility company will provide necessary point of entry and will make actual conduit connection to manhole/handhole.

B. Underground Supplied Fixture Fed from Overhead Distribution Facilities - Wood Pole Riser Connection

Conduit is to be extended to wood pole. Riser section consisting of either grounded galvanized steel or PVC schedule 80 conduit is to be installed on wood pole of sufficient length to extend up wood pole to fuse point located on wood pole.

S671-3.06 Cable

City Street Lighting Section will provide wiring schematics for all cable installation. Number and color of cables to be installed will be as shown on schematic drawings.

A. Cable in Conduit

After conduit has been installed and assembly accepted, install required number of cables. Cable is to be extended from City's handhole/pullbox to private utility manhole/handhole, but not connected. All cable connections will be done by others.

B. Underground Supplied Fixture Fed from Underground Conduit

Cable is to be extended from City's handhole/pullbox to private utility manhole/handhole, but not connected. All cable connections will be done by others. Leave sufficient amount of cable coiled and protected at each connection point to reach center of handhole/pullbox/manhole with enough extra to make actual connection.

C. Underground Supplied Fixture Fed from Overhead Distribution Facilities - Wood Pole Riser Connection

Cable is to be extended from City's handhole/pullbox to and thru wood pole riser, but not connected. All cable connections will be done by others. Provide additional 20 feet of cable at top of riser, coiled and secured.

D. Cable in Pole – Luminaire Connection

After pole has been installed and accepted, install required number of cables thru pole, leaving sufficient amount to make connection to luminaire.

E. Remove Existing Cable

Existing cable is to be removed from conduit and properly disposed of. When removing existing cable, caution is to be taken so as not to damage existing conduit.

S671-3.07 Concrete Pullbox Installation

Pullbox is to be set on 2 inch bed of compacted subbase course Type 2, with cable bracket supports, and frame and cover installed as required. Frame and cover are to be set in mortar, placed true to line and grade, make full and even bearing on underlying surface, and non-rocking when in place. Expansion joints are to be used for installation in paved areas.

Where pullbox is being installed over an existing conduit run, section of existing conduit that is to be removed is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, cut section of conduit is to be removed and disposed of. After pullbox is installed, existing conduit is to be connected to pullbox.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.08 Concrete Pullbox Adjustment/Relocation/Replacement

Before adjusting/relocating/replacing existing pullbox, existing conduit is to be disconnected.

Excavate and remove existing pullbox in such manner that pullbox and any conduit contained therein are not damaged.

Existing pullboxes that are being replaced, are to be removed and disposed of.

Attach new cable bracket on inside of each in existing pullboxes that do not already have cable bracket supports.

Pullbox work is to be done in accordance with Subsection S671-3.07 Concrete Pullbox Installation.

S671-3.09 Concrete Pullbox Frame and Cover Replacement

Existing pullbox frame and cover are to be removed and disposed of. Top of pullbox is to be cleaned of all debris, new pullbox frame and cover set in mortar, placed true to line and grade, make full and even bearing on underlying surface, and non-rocking when in place. Expansion joints are to be used for installation in paved areas.

S671-3.10 Fiberglass Handhole/Pullbox Installation

Handhole/pullbox is to be set on 3 to 6 inch thick bed of compacted sand or subbase course Type 1, true to line and grade, with rim and cover installed as required. Rim and cover are to make continuous full and uniform contact with corresponding box, are to be properly seated and secured, and non-rocking when in place. Expansion joints are to be used for installation in paved areas.

Minimum of 6 inches of loose subbase course Type 1 is to be placed in bottom of handhole/pullbox.

Where handhole/pullbox is being installed over an existing conduit run, section of existing conduit that is to be removed is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, cut section of conduit is to be removed and disposed of. After handhole/pullbox has been installed, existing conduit is to be connected to handhole/pullbox.

Handhole/pullbox that is located within paved area will be supplied with steel rim and cover.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.11 Fiberglass Handhole/Pullbox Adjustment/Relocation/Replacement

Before adjusting/relocating/replacing existing handhole/pullbox, existing conduit is to be disconnected.

Excavate and remove existing handhole/pullbox in such manner that handhole/pullbox and any conduit contained therein are not damaged.

Existing handholes/pullboxes that are being replaced, are to be removed and disposed of.

Handhole/pullbox work is to be done in accordance with Subsection S671-3.10 Fiberglass Handhole/Pullbox Installation

S671-3.12 Remove Existing Handhole/Pullbox

Before removing existing handhole/pullbox, existing conduit is to be disconnected.

Excavate, remove and dispose of existing handhole/pullbox. Backfill excavation with select backfill material.

Existing metal frames and covers that are broken or otherwise structurally unsound are to be properly disposed of.

Existing metal frames and covers that are in good condition are to be salvaged and delivered to City. Before delivery, existing frame and cover are to be cleaned of all extraneous materials, including concrete.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.13 Davit Light Pole – Pole Foundation

Pole foundation is to be cast-in-place complete with anchor bolts, conduit, ground rod, and any necessary fittings. Pole foundation is to be cast against undisturbed earth, with anchor bolts, conduit, ground rod and all fittings held in place with template. Anchor bolts are to extend 3 inches above top of pole foundation, conduit minimum 9 inches. Ground rod is to be bent into and extend 4 inches above top of pole foundation.

Earth anchors may be used for preparation of excavation for casting pole foundation. Use of sonotubes for forming pole foundations will not be allowed, unless specifically approved for use by Project Manager.

Precast pole foundation may be used only with approval of Project Manager. Precast pole foundation is to be installed complete with required anchor bolts, conduit, ground rod, and any necessary fittings.

Where pole foundation is being installed over an existing conduit run, section of existing conduit that is to be removed is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, cut section of conduit is to be removed and disposed of. After pole foundation has been installed, existing conduit is to be connected to connector opening in pole foundation.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.14 Other Metal Light Pole – Pole Foundation

Pole foundation is to be precast and installed complete with required anchor bolts, conduit, ground rod, and any necessary fittings. Anchor bolts are to extend minimum of 2 inches above top of pole foundation, conduit minimum 6 inches. Ground rod is to extend 4 inches above top of pole foundation.

Cast-in-place foundation may be used only with approval of the Project Manager. Pole foundation is to be cast against undisturbed earth, with anchor bolts, conduit, ground rod and all fittings held in place with template. Anchor bolts are to extend 3 inches above top of pole foundation, conduit minimum 9 inches. Ground rod is to be bent into and extend 4 inches above top of pole foundation.

Earth anchors may be used for preparation of excavation for casting pole foundation. Use of sonotubes for forming pole foundations will not be allowed, unless specifically approved for use by Project Manager.

Where pole foundation is being installed over an existing conduit run, section of existing conduit that is to be removed is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, cut section of conduit is to be removed and disposed of. After pole foundation has been installed, existing conduit is to be connected to connector opening in pole foundation.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.15 Fiberglass Light Pole – Pole Foundation

Pole foundation is to be precast and installed complete with required anchor bolts, conduit and any necessary fittings. Anchor bolts are to extend minimum of 2 inches above top of pole foundation, conduit minimum 6 inches.

Cast-in-place foundation may be used only with approval of the Project Manager. Pole foundation is to be cast against undisturbed earth, with anchor bolts, conduit and all fittings held in place with template. Anchor bolts are to extend 3 inches above top of pole foundation, conduit minimum 6 inches.

Earth anchors may be used for preparation of excavation for casting pole foundation. Use of sonotubes for forming pole foundations will not be allowed, unless specifically approved for use by Project Manager.

Where pole foundation is being installed over an existing conduit run, section of existing conduit that is to be removed is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, cut section of conduit is to be removed and disposed of. After pole foundation has been installed, existing conduit is to be connected to connector opening in pole foundation.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.16 Pole Foundation Adjustment/Relocation

Before removing existing pole foundation, existing conduit is to be disconnected. Existing pole foundation is to be removed in such manner that pole foundation is not damaged.

Pole foundation is to be re-installed in accordance Subsection S671-3 Construction Details, and conduit re-connected.

Where pole foundation is being installed over an existing conduit run, section of existing conduit that is to be removed is to be saw cut such that section of conduit which is to remain will have squared neat edges. After cutting, cut section of conduit is to be removed and disposed of. After pole foundation has been installed, existing conduit is to be connected to connector opening in pole foundation.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.17 Pole Foundation Extension

Top of existing pole foundation is to be scarified, or portion removed to accommodate new concrete cap. Use extra caution so that any exposed cable is not cut or otherwise damaged. Extend existing anchor bolts and conduit as required with appropriate nipples, extensions and couplings. Clean surface of pole foundation and coat with an approved slurry bond coat, form and pour new concrete cap.

S671-3.18 Remove Existing Light Pole

Existing light pole, with or without luminaire, is to be removed and properly disposed of.

Existing luminaire that is to be salvaged, is to be removed in accordance with Subsection S671-3 Construction Details.

S671-3.19 Remove Existing Pole Foundation

Before removing existing foundation, existing conduit is to be disconnected from existing foundation. Existing foundation is to be removed and either salvaged or properly disposed of. Existing precast foundations that are in good condition are to be salvaged and delivered to City.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.20 Salvage Existing Luminaire

Only existing luminaire that is in good condition and as approved of by Project Manager as acceptable, is to be salvaged. Existing luminaire to be salvaged may be on concrete, fiberglass or metal light pole. In any case, existing luminaire is to be carefully removed so as not to cause any damage to existing luminaire.

S671-3.21 Salvage Existing Mast Arm

Only existing mast arm that is in good condition and as approved of by Project Manager as acceptable, is to be salvaged. Existing mast arm is to be carefully removed so as not to cause any structural damage to existing mast arm.

S671-3.22 Salvage Existing Light Pole

Only existing light pole that is in good condition and as approved of by Project Manager as acceptable, is to be salvaged. Existing light pole to be salvaged may be fiberglass or metal light pole, with or without mast arm. Existing light pole is to be carefully removed so as not to cause any structural damage to existing light pole.

Before removing existing foundation, existing conduit is to be disconnected from existing foundation. Existing foundation is to be removed and either salvaged or properly disposed of. Existing precast foundations that are in good condition are to be salvaged and delivered to City.

New conduit is to be installed to fill in any gaps in conduit in accordance with Subsection S671-3 Construction Details.

S671-3.23 Install Concrete Light Pole (Furnished)

Light pole is direct embedded concrete pole, with embedded portion being approximately 4 feet deep.

Excavate hole to proper depth, set light pole ensuring that it is vertical and plumb, with connector opening oriented for connection of conduit.

Run required cable thru and out top of light pole, extending cable out top of light pole leaving sufficient length for connection of luminaire.

S671-3.24 Install Ornamental Luminaire (Furnished)

Connect cable to luminaire. Place, connect and orient luminaire on top of light pole, ensuring that luminaire is securely attached to light pole to form rigid assembly.

S671-3.25 Replace Existing Concrete Light Pole (Furnished)

Disconnect and remove existing luminaire, cable and concrete light pole. Install new concrete light pole, run existing or new cable thru light pole, and install existing or new luminaire, in accordance with Subsection S671-3 Construction Details.

S671-3.26 Replace Existing Ornamental Luminaire (Furnished)

Disconnect and remove existing luminaire and cable Connect cable to luminaire. Place, connect and orient luminaire on top of light pole, ensuring that luminaire is securely attached to light pole to form rigid assembly.

S671-3.27 Daily Cleanup of Work Site

All streets and sidewalks shall be cleaned of all spoil and debris including removal of old pole base foundations, at the end of each working day. Stockpiling of any material shall be only as approved by the Project Manager.

S671-4 METHOD OF MEASUREMENT

S671-4.01 Conduit and Cable

Quantity to be measured for payment will be number of linear feet of conduit, with or without cable, installed or replaced, as measured from exterior of pole foundation or embedded pole, to handhole, pullbox, manhole, or wood pole riser connection.

Conduit that crosses driveway, sidewalk, or other hard surface areas outside of roadway, will be paid for under general bid items for conduit.

Conduit that crosses roadway, will be measured and paid for under bid items for Conduit – in Roadway. Quantity to be measured for payment will be number of linear feet of conduit as measured from 1 foot behind face of curb, or back edge of concrete gutter, on both sides of roadway; or from exterior of pole foundation or embedded pole located on one side of roadway, across roadway to handhole, pullbox, manhole, or wood pole riser located on opposite side of roadway.

No separate payment will be made for conduit located within pole foundation.

No separate payment will be made for cable. Payment for cable will be included within respective bid items for conduit, pole foundation, handhole, pullbox, wood pole riser, light pole and luminaire.

S671-4.02 All Other Items

Quantity to be measured for payment will be number of units installed, adjusted, relocated, replaced or removed.

S671-5 BASIS OF PAYMENT

S671-5.01 General All Items

Unit price bid for all items includes cost of: shop drawings; tree protection; coordination with City's Street Lighting Contractor for installation of, or removal and reinstallation of cable, light poles, luminaires and all other related appurtenances; daily cleanup of work site; and furnishing all labor, material and equipment necessary to complete work.

Installation of conduit, pole foundation, handhole, pullbox, wood pole riser, light pole and luminaire may or may not include cable, as noted in Contract Documents.

Cost of picking up of furnished materials and delivery of salvaged items is included in the unit price bid for those respective items.

Cost of removal and reinstallation of existing traffic signage that is located on light pole will be paid for under NYSDOT Section 619 Work Zone Traffic Control, or work will be done by others.

S671-5.02 Conduit

Unit price bid also includes cost of: furnishing and installing new conduit; fittings, solvent cement; gluing; warning tape, pull cord, couplings and insulating bushings; testing for clear bore and correct installation; connecting conduit to handholes, pullboxes, existing conduit, pole foundations, direct embedded pole, wood pole riser connection, and other electrical facilities.

For conduit in roadway, unit price bid also includes cost of: concrete encasement for open trenching.

For conduit replacement, unit price bid also includes cost of: disconnecting, cutting, removing and disposing of existing conduit.

S671-5.03 Wood Pole Riser Connection

Unit price bid also includes cost of: furnishing and installing riser conduit; grounding; hardware.

S671-5.04 Concrete Pullbox

A. Concrete Pullbox Installation

Unit price bid also includes cost of: furnishing and installing new pullbox with frame and cover; cable support brackets; mortar; expansion joints; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; connecting conduit to pullbox; excavation and backfill.

B. Concrete Pullbox Adjustment

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing pullbox, frame and cover; cable support brackets; mortar; expansion joints; subbase course Type 2 bedding; reconnecting existing conduit to pullbox; excavation and backfill.

C. Concrete Pullbox Relocation

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing pullbox, frame and cover; cable support brackets; mortar; expansion joints; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; connecting conduit to pullbox; in-fill conduit; excavation and backfill.

D. Concrete Pullbox Replacement

Unit price bid also includes cost of: disconnecting existing conduit; removing and disposing existing pullbox, frame and cover; furnishing and installing new pullbox with frame and cover; cable support brackets; mortar; expansion joints; subbase course Type 2 bedding; reconnecting existing conduit to pullbox; excavation and backfill.

E. Concrete Pullbox Frame and Cover Replacement

Unit price bid also includes cost of: removing and disposing existing frame and cover; providing and installing new frame and cover; or picking up and installing City furnished frame and cover; mortar; expansion joints; excavation and backfill.

S671-5.05 Fiberglass Handhole/Pullbox

A. Fiberglass Handhole/Pullbox Installation

Unit price bid also includes cost of: picking up and installing City furnished handhole/pullbox with rim and cover; steel rim and cover in paved areas; expansion joints; sand; subbase course Type 1; cutting, removing and disposing section of existing conduit; connecting conduit to handhole/pullbox; excavation and backfill.

B. Fiberglass Handhole/Pullbox Adjustment

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing handhole/pullbox, rim and cover; expansion joints; sand; subbase course Type 1; reconnecting existing conduit to handhole/pullbox; excavation and backfill.

C. Fiberglass Handhole/Pullbox Relocation

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing handhole/pullbox, rim and cover; expansion joints; sand; subbase course Type 1; cutting, removing and disposing section of existing conduit; connecting conduit to handhole/pullbox; in-fill conduit; excavation and backfill.

D. Fiberglass Handhole/Pullbox Replacement

Unit price bid also includes cost of: disconnecting existing conduit; removing and disposing existing handhole/pullbox, rim and cover; picking up and installing City furnished handhole/pullbox rim and cover; steel rim and cover in paved areas; expansion joints; sand; subbase course Type 1; reconnecting existing conduit to handhole/pullbox; excavation and backfill.

E. Replace Fiberglass Handhole/Pullbox Rim and Cover with Steel Rim and Cover (Furnished)

Unit price bid also includes cost of: removing and disposing existing handhole/pullbox rim and cover; picking up and installing City furnished handhole/pullbox steel rim and cover.

S671-5.06 Remove Existing Handhole/Pullbox

Unit price bid also includes cost of: disconnecting existing conduit; removing and disposing existing handhole/pullbox, frame and cover; in-fill conduit; excavation and backfill.

Salvage of existing pullbox metal frame and cover will be paid for under separate bid item.

S671-5.07 Pole Foundation – Precast or Cast-in-Place

Unit price bid also includes cost of: furnishing and installing precast or cast-in-place pole foundation; ground rod; interior conduit and fittings, with or without cable; picking up and installing anchor bolts, nuts, washers and other necessary fittings; leveling shims; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; connecting conduit to pole foundation; excavation and backfill.

S671-5.08 Pole Foundation Adjustment

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing pole foundation; ground rod; subbase course Type 2 bedding; reconnecting existing conduit to pole foundation; excavation and backfill.

S671-5.09 Pole Foundation Relocation

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing pole foundation; ground rod; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; connecting conduit to pole foundation; in-fill conduit; excavation and backfill.

S671-5.10 Pole Foundation Extension

Unit price bid also includes cost of: scarifying, removing and preparation of top portion existing pole foundation; furnishing and installing concrete cap; cleaning; slurry bond coat; conduit and anchor bolt extensions, couplings, nipples; leveling shims; excavation and backfill.

S671-5.11 Remove Existing Pole Foundation

Unit price bid also includes cost of: disconnecting existing conduit; removing and disposing existing pole foundation; ground rod; salvaging and delivering precast foundation; in-fill conduit; excavation and backfill.

S671-5.12 Remove Existing Light Pole

Unit price bid also includes cost of: removing and disposing existing light pole, with or without luminaire; excavation and backfill.

Removal of existing foundation and installation of new conduit will be paid for under separate bid items.

S671-5.13 Conduit and Cable

Unit price bid also includes cost of: furnishing and installing new conduit; cable; fittings, solvent cement; gluing; warning tape, pull cord, couplings and insulating bushings; testing for clear bore and correct installation; connecting conduit and cable to handholes, pullboxes, existing conduit, pole foundations, direct embedded pole, wood pole riser connection, and other electrical facilities.

For conduit in roadway, unit price bid also includes cost of: concrete encasement.

S671-5.14 Wood Pole Riser Connection (Including Cable)

Unit price bid also includes cost of: furnishing and installing riser conduit; cable; grounding; hardware.

S671-5.15 Salvage Existing Pullbox Metal Frame and Cover

Unit price bid also includes cost of: removing, cleaning, salvaging and delivering to City existing pullbox metal frame and cover; excavation and backfill.

Removal of existing pullbox will be paid for under separate bid item.

S671-5.16 Salvage Existing Luminaire

Unit price bid also includes cost of: removing, salvaging and delivering to City existing luminaire.

S671-5.17 Salvage Existing Metal Mast Arm

Unit price bid also includes cost of: removing, salvaging and delivering to City existing metal mast arm.

Payment under this item will only be made where existing mast arm is being salvaged, and existing light pole is to remain, or removed and disposed of.

S671-5.18 Salvage Existing Light Pole

Unit price bid also includes cost of: removing, salvaging and delivering to City existing light pole, with or without mast arm; excavation and backfill.

Removal of existing foundation and installation of new conduit will be paid for under separate bid items.

S671-5.19 Install Concrete Light Pole (Furnished)

Unit price bid also includes cost of: picking up and installing direct embedded concrete light pole; cable; wiring; excavation and backfill.

S671-5.20 Replace Existing Concrete Light Pole (Furnished)

Unit price bid also includes cost of: removing and reinstalling existing luminaire; removing and disposing existing concrete light pole; picking up and installing new direct embedded concrete light pole; cable; wiring; excavation and backfill.

S671-5.21 Install Concrete Light Pole Ornamental Luminaire (Furnished)

Unit price bid also includes cost of: picking up and installing concrete light pole ornamental luminaire; cable; wiring.

S671-5.22 Replace Existing Concrete Light Pole Ornamental Luminaire (Furnished)

Unit price bid also includes cost of: removing and dispose existing luminaire; picking up and installing new ornamental luminaire; cable; wiring.

S671-5.23 Remove Existing Cable

Unit price bid also includes cost of: removing and dispose existing cable; excavation and backfill.

S671-5.24 Excavation, Backfill and Surface Restoration – all Items

Excavation including trenching or boring, backfill and surface restoration, will be paid for under separate bid items or included in unit price bid for item as indicated in item description.

Excavation that is included in bid item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Where bid item includes cost of pavement restoration, pavement base may consist of either concrete base or asphalt base course, as required in Contract Documents. Unit price bid will be same regardless of which type of pavement base is used, and bid items will include cost of: subbase courses type 1 and type 2; either Class C concrete foundation or asphalt base course; asphalt binder course; asphalt top course; and asphalt tack coat.

Payment will be made under:

Note: XX in bid item number and X" in item description represents size of conduit. i.e.: 2 inch conduit would be bid as S671.020102 2" PVC Conduit.

Note: XXXX in bid item number and X" in item description represents size of conduit. i.e.: 1-1/ 2 inch conduit would be bid as S671.50010150 1-1/ 2" PVC Conduit and Cable.

ITEM NO.	ITEM	PAY UNIT
S671.0201XX	X" PVC Conduit	Linear Foot
S671.0202XX	X" PVC Conduit (Including Excavation and Backfill)	Linear Foot
S671.0203XX	X" PVC Conduit (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0301XX	X" PVC Conduit - in Roadway	Linear Foot
S671.0302XX	X" PVC Conduit - in Roadway (Including Excavation and Backfill)	Linear Foot
S671.0303XX	X" PVC Conduit - in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0401XX	X" Galvanized Steel Conduit - in Roadway	Linear Foot
S671.0402XX	X" Galvanized Steel Conduit - in Roadway (Including Excavation and Backfill)	Linear Foot
S671.0403XX	X" Galvanized Steel Conduit - in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0501XX	Replace Existing Conduit with X" PVC Conduit	Linear Foot
S671.0502XX	Replace Existing Conduit with X" PVC Conduit (Including Excavation and Backfill)	Linear Foot
S671.0503XX	Replace Existing Conduit with X" PVC Conduit (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0601XX	Replace Existing Conduit with X" PVC Conduit - in Roadway	Linear Foot
S671.0602XX	Replace Existing Conduit with X" PVC Conduit - in Roadway (Including Excavation and Backfill)	Linear Foot
S671.0603XX	Replace Existing Conduit with X" PVC Conduit - in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0701XX	Replace Existing Conduit with X" Galvanized Steel Conduit - in Roadway	Linear Foot
S671.0702XX	Replace Existing Conduit with X" Galvanized Steel Conduit - in Roadway (Including Excavation and Backfill)	Linear Foot
S671.0703XX	Replace Existing Conduit with X" Galvanized Steel Conduit - in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0801	Wood Pole Riser Connection	Each

ITEM NO.	ITEM	PAY UNIT
S671.1024	Concrete Pullbox (24")	Each
S671.1030	Concrete Pullbox (30")	Each
S671.1101	Adjust Existing Concrete Pullbox	Each
S671.1201	Relocate Existing Concrete Pullbox	Each
S671.1301	Replace Existing Concrete Pullbox	Each
S671.1401	Replace Existing Concrete Pullbox Frame and Cover	Each
S671.1402	Replace Existing Concrete Pullbox Frame and Cover (Furnished)	Each
S671.1501	Remove Existing Concrete/Brick Pullbox	Each
S671.1601	Install Fiberglass Handhole/Pullbox (Furnished)	Each
S671.1701	Adjust Existing Fiberglass Handhole/Pullbox	Each
S671.1801	Relocate Existing Fiberglass Handhole/Pullbox	Each
S671.1901	Replace Existing Fiberglass Handhole/Pullbox (Furnished)	Each
S671.2001	Remove Existing Fiberglass Handhole/Pullbox	Each
S671.2101	Replace Existing Fiberglass Handhole/Pullbox Rim and Cover with Steel Rim and Cover (Furnished)	Each
S671.3001	Davit Light Pole Foundation	Each
S671.3101	Metal Light Pole Foundation	Each
S671.3201	Fiberglass Light Pole Foundation - Precast	Each
S671.3202	Fiberglass Light Pole Foundation - Cast-in-Place	Each
S671.3301	Adjust Existing Light Pole Foundation	Each
S671.3401	Relocate Existing Light Pole Foundation	Each
S671.3501	Extend Existing Light Pole Foundation	Each
S671.3601	Remove Existing Light Pole Foundation	Each
S671.40	Remove Existing Light Pole	Each
S671.5001XXXX	X" PVC Conduit and Cable	Linear Foot
S671.5002XXXX	X" PVC Conduit and Cable (Including Excavation and Backfill)	Linear Foot
S671.5003XXXX	X" PVC Conduit and Cable (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.5101XXXX	X" PVC Conduit and Cable – in Roadway	Linear Foot
S671.5102XXXX	X" PVC Conduit and Cable – in Roadway (Including Excavation and Backfill)	Linear Foot
S671.5103XXXX	X" PVC Conduit and Cable – in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.52	Wood Pole Riser Connection (Including Cable)	Each
S671.60	Salvage Existing Pullbox Metal Frame and Cover	Each
S671.61	Salvage Existing Luminaire – Concrete Pole	Each
S671.62	Salvage Existing Luminaire – Fiberglass Pole	Each
S671.63	Salvage Existing Luminaire – Metal Pole	Each
S671.64	Salvage Existing Metal Mast Arm	Each
S671.65	Salvage Existing Fiberglass Light Pole	Each
S671.66	Salvage Existing Metal Light Pole	Each
S671.70	Install Concrete Light Pole (Furnished)	Each
S671.71	Replace Existing Concrete Light Pole (Furnished)	Each
S671.8001	Install Ornamental Luminaire (Furnished)	Each
S671.8101	Replace Existing Ornamental Luminaire (Furnished)	Each
S671.82	Remove Existing Cable	Linear Foot

REVISED March 3, 2015