

SECTION S671 - STREET LIGHTING

S671-1 DESCRIPTION

Work consists of installing, adjusting, relocating or replacing street lighting appurtenances as required in Contract Documents, coordination of work with City's Street Lighting Maintenance Contractor, and as directed by Project Manager.

References to NYSDOT specifications are to be in accordance with latest edition of *NYSDOT Standard Specifications (US Customary Units)*.

S671-2 MATERIALS

S671-2.01 Conduit and Cable

A. Conduit

PVC conduit and fittings for installation outside of roadway 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.

PVC conduit and fittings for installation in roadway and for wood pole riser 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 and 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.

HDPE conduit and fittings 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.

Galvanized steel conduit and fittings 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. 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/green. 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.

C. 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.

D. Miscellaneous Hardware

Bolt connector is to be copper split bolt connector in accordance with catalog number KS20 as manufactured by BURNDY, or approved equivalent.

Fuse holder is to be Bussman series TRON in-line fuse holder HEB-BW-RLC-B with two L-type insulating boots as manufactured by EATON, or approved equivalent.

Fuse is to be Bussman series fuse KTK 13/32 inch x 1-1/2 inch as manufactured by EATON, 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 6 inch wide, red colored, marked "CAUTION ELECTRICAL CABLE BURIED BELOW" as manufactured by Terra Tape, Allen System, Inc., or approved equivalent.

S671-2.03 Handhole/Pullbox

Handhole/pullbox will be concrete, fiberglass or polymer concrete as required in Contract Documents.

S671-2.04 Pole Foundation

Pole foundations for fiberglass are to be precast. Cast-in-place foundations will be allowed only as approved of by Project Manager.

Pole foundations for metal 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:

- Fiberglass/polymer concrete handhole/pullbox
- Steel rim and cover for fiberglass/polymer concrete handhole/pullbox

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 five (5) working days advance notice to make arrangements for pickup of furnished materials, (585) 428-7170.

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 MasterEmaco A 660 (formerly Acryl 60) as manufactured by Master Builders Solutions L&M Everbond as manufactured by Laticrete, or approved equivalent.

S671-2.07 Grout

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

S671-2.08 Concrete

Concrete is to be Class A in accordance with NYSDOT Sections 501 Portland Cement Concrete – General and 704-03 Precast Concrete – General, except that requirements for inspection facilities, automated batching control and recordation do not apply.

S671-2.09 Subbase Course Material

Subbase course material is to be Type 1 and Type 2 in accordance with NYSDOT Section 304 Subbase Course, with following modification.

Recycled materials, pulverized or recycled portland cement concrete aggregate (RCA) and brick, reclaimed asphalt pavement (RAP), and Corian® are unacceptable for use as subbase course materials, unless specifically authorized in writing by City Engineer.

S671-2.10 Sand

Sand is to be in accordance with NYSDOT Section 733-15 Sand backfill.

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 insufficient quantity of excavated materials are not available, provide select granular fill in accordance with NYSDOT Section 733-11 Select Granular Fill.

S671-2.12 Excavation, Backfill and Surface Restoration

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

- Section S203 Excavation and Embankment
- Section R206 Trench and Culvert Excavation
- Section S608 Sidewalk and Driveway
- Section S610 Landscape
- NYSDOT Section 203 Excavation and Embankment
- NYSDOT Section 206 Trench and Culvert Excavation
- NYSDOT Section 304 Subbase Course
- NYSDOT Section 610 Ground Vegetation – Preparation, Establishment and Management

Pavement restoration materials are to be in accordance with:

- 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 – compaction series as required in Contract Documents
 - 19 F9 binder course, HMA – compaction series as required in Contract Documents
 - 37.5 F9 base course, HMA – compaction series as required in Contract Documents
- NYSDOT Section 407 Tack Coat - diluted or straight tack coat
- NYSDOT Section 418 Asphalt Joint Adhesive
- 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

All electrical wiring, splices and connections must be done by Master Licensed Electrician.

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 Maintenance Contractor, unless otherwise noted. Where such work is required, Project Manager is to be notified minimum of five (5) 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 Maintenance Contractor, and will not be held liable or responsible for any delays in performing work that are caused by City's Street Lighting Maintenance 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.

Split duct repairs on conduits are not allowed.

Removal and reinstallation of existing traffic signage attached to street lighting pole will be done by Contractor or by others, as required in Contract Documents. Contractor performed work is to be done in accordance with NYSDOT Section 619 Work Zone Traffic Control.

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
- NYSDOT Section 203 Excavation and Embankment
- NYSDOT Section 206 Trench and Culvert Excavation
- NYSDOT Section 304 Subbase Course
- NYSDOT Section 610 Ground Vegetation – Preparation, Establishment and Management

Pavement restoration is to be in accordance with Construction Details for:

- NYSDOT Section 304 Subbase Course - subbase course Type 1 and Type 2
- NYSDOT Section 402 Hot Mix Asphalt (HMA) Pavements
- NYSDOT Section 407 Tack Coat - diluted or straight tack coat
- NYSDOT Section 418 Asphalt Joint Adhesive
- NYSDOT Section 503 Portland Cement Concrete Foundation for Pavement

Recycled materials, pulverized or recycled portland cement concrete aggregate (RCA) and brick, reclaimed asphalt pavement (RAP), and Corian® are unacceptable for use as backfill or bedding materials, unless specifically authorized in writing by City Engineer.

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 five (5) working days advance notice to make arrangements for delivery of salvaged materials, (585) 428-7170.

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. General

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

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

Conduit installation under driveways, sidewalks and trees is to be done only by directional boring, where possible.

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 structures. Private utility company will provide necessary point of entry and will make actual conduit connection to their structure.

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

Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered to prevent extraneous material and ground water from entering and contaminating conduit.

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

Backfill trench with select granular fill material in accordance with NYSDOT Section 203 Excavation and Backfill, except that backfill is to be placed and compacted in layers not exceeding 6 inch thickness, and compacted to 95% of modified proctor maximum dry density test per ASTM D1557

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/wood pole riser located on opposite side of roadway.

PVC/HDPE conduit in open trench roadway crossings is to be encased within minimum of 3 inches of Class A 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/HDPE conduit, or metal conduit.

If existing pump log or conduit 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 that is to be replaced may be either saw cut at each end, or completely disconnected from handhole/pullbox or other structure that is to remain. Removed pieces of conduit are to be properly disposed. Perform saw cutting such that section of conduit which is to remain will have squared neat edges.

New conduit that is to be installed is to be connected to existing conduit with appropriate fittings.

E. Conduit Removal

Section of existing conduit that is to be removed may be either saw cut at each end, or completely disconnected from handhole/pullbox or other structure. Removed pieces of conduit are to be properly disposed.

Perform saw cutting such that section of conduit which is to remain will have squared neat edges. Open ends of remaining conduit are to be either capped, or plugged and sealed with cement mortar.

Where section of existing conduit to be removed is connected to structure, conduit is to be disconnected and completely removed from structure. Opening in structure is to be completely filled in and sealed with cement mortar.

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 structure, but not connected.

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 where fuse point is located on wood pole.

C. Wood Pole Riser Replacement

Riser section to be replaced is to be disconnected from power point, wood pole and underground conduit. If necessary, riser section may be saw cut at connection point with underground conduit. Perform saw cutting such that section of underground conduit which is to remain will have squared neat edges. Removed riser section and hardware is to be properly disposed of. Install new riser section and connect to existing/new wood pole and underground conduit with appropriate fittings.

D. Wood Pole Riser Removal

Riser section to be removed is to be disconnected from power point, wood pole and underground conduit. If necessary, riser section may be saw cut at connection point with underground conduit. Perform saw cutting such that section of underground conduit which is to remain will have squared neat edges. Removed riser section and hardware is to be properly disposed of.

S671-3.06 Cable

A. Cable in Conduit - General

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

After conduit has been installed and assembly accepted, install required number of cables. Cable is to be run from structure to structure, but not connected. Actual connection of cable will be done by others.

Provide sufficient length of cable at each connection point to reach center of structure plus an additional 10 feet of cable coiled and protected.

For wood pole riser, cable is to be extended to and up thru wood pole riser conduit, but not connected. Provide an additional 20 feet of cable coiled, protected and secured at top of riser.

B. Cable in Pole – Luminaire Connection

After pole has been installed and accepted, install required number of cables up thru pole plus an additional 10 feet of cable coiled, protected and secured at top of pole to make connection to luminaire.

C. 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 pieces of conduit are to be removed and disposed of. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After pullbox is installed, extend and connect conduit to pullbox as required.

S671-3.08 Concrete Pullbox Adjustment/Relocation/Replacement

Before adjusting/relocating/replacing existing pullbox, existing conduit is to be disconnected from structure walls. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After pullbox is reinstalled, extend and connect conduit to pullbox as required.

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

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

Where missing or damaged, provide and install new frame and cover, and new cable bracket(s) on inside of pullbox.

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 Handhole/Pullbox (Furnished) 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 pieces of conduit are to be removed and disposed of. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After handhole/pullbox is installed, extend and connect conduit to handhole/pullbox as required.

Install steel rim and cover where handhole/pullbox is located within paved area.

S671-3.11 Handhole/Pullbox Adjustment/Relocation/Replacement

Before adjusting/relocating/replacing existing handhole/pullbox, existing conduit is to be disconnected from structure walls. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After handhole/pullbox is reinstalled, extend and connect conduit to handhole/pullbox as required.

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

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

Install steel rim and cover where handhole/pullbox is located within paved area.

Handhole/pullbox work is to be done in accordance with Subsection S671-3.10 Handhole/Pullbox (Furnished) Installation.

S671-3.12 Remove Existing Handhole/Pullbox

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

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 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.

Until new infill conduit can be installed and connected, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. New infill conduit is to be installed and connected to existing conduit with appropriate fittings to fill in any gaps in accordance with Subsection S671-3 Construction Details.

S671-3.13 Metal Light Pole – 20' and Greater – 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, complete with anchor bolts, conduit, ground rod and all fittings held in place with template.

Top of pole foundation is to be 2 inches above finished grade. 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, and is to be furnished and installed in accordance with Subsection S671-3.14 Metal Light Pole – Under 20' – Pole Foundation.

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 pieces of conduit are to be removed and disposed of. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After pole foundation is installed, extend and connect conduit to pole foundation as required.

S671-3.14 Metal Light Pole – Under 20' – Pole Foundation

Pole foundation is to be precast and installed complete with required anchor bolts, conduit, ground rod, and any necessary fittings.

Top of pole foundation is to be 2 inches above finished grade. 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 Project Manager, and is to be furnished and constructed in accordance with Subsection S671-3.13 Metal Light Pole – 20' and Greater – Pole Foundation.

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 pieces of conduit are to be removed and disposed of. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After pole foundation is installed, extend and connect conduit to pole foundation as required.

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.

Top of pole foundation is to be 2 inches above finished grade. 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 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 pieces of conduit are to be removed and disposed of. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After pole foundation is installed, extend and connect conduit to pole foundation as required.

S671-3.16 Pole Foundation Adjustment/Relocation

Before removing existing pole foundation, existing conduit is to be disconnected from foundation. 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.

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 pieces of conduit are to be removed and disposed of. Until conduit connection(s) can be made, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. After pole foundation is reinstalled, extend and connect conduit to pole foundation as required.

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 signage that is attached to pole is to be removed, stored and/or disposed of by Contractor or others as required in Contract Documents. 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.

Until new infill conduit can be installed and connected, open ends of conduit are to be temporarily capped with appropriate conduit fittings, or otherwise completely covered. New infill conduit is to be installed and connected to existing conduit with appropriate fittings to fill in any gaps 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 signage that is attached to pole is to be removed, stored and/or disposed of by Contractor or others as required in Contract Documents. Existing light pole is to be carefully removed so as not to cause any structural damage to existing light pole.

S671-3.23 Install Concrete Light Pole

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.

Install cable in accordance with Subsection S671-3.06 Cable.

S671-3.24 Install Luminaire

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

Disconnect and remove existing luminaire, cable and concrete light pole.

Install new concrete light pole, run existing or new cable up thru light pole, and install existing or new luminaire, in accordance with Subsections S671-3.06 Cable, S671.23 Install Concrete Light Pole, S671-3.24 Install Luminaire.

S671-3.26 Replace Existing Luminaire

Disconnect and remove existing luminaire, and disconnect cable. Protect and secure existing cable until new luminaire can be installed.

Extend existing cable if necessary, and connect to new luminaire. Install new luminaire in accordance with Subsection S671-3.24 Install Luminaire.

S671-3.27 Daily Cleanup of Work Site

Clean work site daily of all spoil and debris, including old pole base foundations.

S671-4 METHOD OF MEASUREMENT

S671-4.01 Conduit and Cable

Quantity to be measured for payment will be number of lineal 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.

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 Maintenance 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 temporarily capping or otherwise completely covering open ends of conduit is to be included in unit price bid for respective work items.

Cost of picking up of and delivering furnished materials is to be included in unit price bid for respective work items.

Cost of removal and disposition of existing signage that is located on light pole will be paid for under separate bid item, or work will be done by others.

Cost of 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.

S671-5.02 Conduit

A. Conduit Installation/Replacement

Unit price bid also includes cost of: furnishing, installing and connecting new conduit and fittings, solvent cement; gluing; pull cord; testing for clear bore and correct installation.

For conduit installed by open trenching, unit price bid also includes cost of: furnishing and installing warning tape.

For conduit in roadway installed by open trenching, unit price bid also includes cost of: furnishing and installing concrete encasement; and warning tape.

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

B. Conduit Removal

Unit price bid includes cost of: disconnecting, saw cutting, removing and disposing of existing conduit; temporarily capping or otherwise completely covering open ends of conduit; or plugging and sealing with cement mortar open ends of conduit; disconnecting and removing conduit from structure, and filling in and sealing structure opening with cement mortar.

S671-5.03 Wood Pole Riser

A. Wood Pole Riser Installation/Replacement

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

For replacement of wood pole riser, unit price bid also includes cost of: saw cutting and/or disconnecting, removing and disposing existing riser conduit and hardware; furnishing and installing new riser conduit and hardware; grounding.

B. Remove Existing Wood Pole Riser

Unit price bid includes cost of: saw cutting and/or disconnecting, removing and disposing existing riser conduit and hardware; temporarily capping or otherwise completely covering open ends of conduit; or plugging and sealing with cement mortar open ends of conduit.

S671-5.04 Concrete Pullbox

A. Concrete Pullbox Installation

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

B. Concrete Pullbox Adjustment/Relocation

Unit price bid also includes cost of: disconnecting existing conduit; removing and reinstalling existing pullbox, frame and cover; furnishing and installing cable support bracket(s); mortar; expansion joints; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; furnishing, extending and connecting conduit to pullbox; excavation and backfill.

Cost of furnishing and installing new frame and cover will be paid for under separate bid item.

C. 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 complete with frame and cover; cable support bracket(s); mortar; expansion joints; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; furnishing, extending and connecting conduit to pullbox; excavation and backfill.

D. Concrete Pullbox Frame and Cover Replacement

Unit price bid also includes cost of: removing and disposing existing frame and cover; furnishing and installing new frame and cover; mortar; expansion joints; excavation and backfill.

S671-5.05 Handhole/Pullbox

A. Handhole/Pullbox (Furnished) Installation

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

Unit price bid also includes cost of: picking up and installing new steel rim frame and cover.

B. Handhole/Pullbox Adjustment/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; furnishing, extending and connecting conduit to handhole/pullbox; excavation and backfill.

Cost of picking up and installing City furnished steel rim frame and cover will be paid for under separate bid item.

C. Handhole/Pullbox (Furnished) 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 complete with rim and cover; expansion joints; sand; subbase course Type 1; cutting, removing and disposing section of existing conduit; furnishing, extending and connecting conduit to handhole/pullbox; excavation and backfill.

Unit price bid also includes cost of: picking up and installing new steel rim frame and cover.

D. Replace 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 handhole/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; anchor bolts, nuts, washers and other necessary fittings; interior conduit and fittings, with or without cable; leveling shims; subbase course Type 2 bedding; cutting, removing and disposing section of existing conduit; furnishing, extending and 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; cutting, removing and disposing section of existing conduit; furnishing, extending and connecting 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; furnishing, extending and connecting conduit to pole foundation; 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; cutting, removing and disposing section of existing conduit; furnishing, extending and connecting 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, installing and connecting new conduit; cable; fittings, solvent cement; gluing; pull cord, couplings and insulating bushings; testing for clear bore and correct installation.

For conduit installed by open trenching, unit price bid also includes cost of: furnishing and installing warning tape.

For conduit in roadway installed by open trenching, unit price bid also includes cost of: furnishing and installing concrete encasement; and warning tape.

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

S671-5.14 Wood Pole Riser Connection (Including Cable)

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

S671-5.15 Salvage Existing Metal Frame and Cover

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

Removal of existing handhole/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 Mast Arm

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

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

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

S671-5.20 Replace Existing Concrete Light Pole

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

S671-5.21 Install Luminaire

Unit price bid also includes cost of: furnishing and installing luminaire; cable; wiring.

S671-5.22 Replace Existing Luminaire

Unit price bid also includes cost of: removing and dispose existing luminaire; furnishing and installing new 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.

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.

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
S671.0704	Remove Existing Conduit	Linear Foot
S671.0705	Remove Existing Conduit (Including Excavation and Backfill)	Linear Foot
S671.0706	Remove Existing Conduit (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0707	Remove Existing Conduit in Roadway	Linear Foot
S671.0708	Remove Existing Conduit in Roadway (Including Excavation and Backfill)	Linear Foot
S671.0709	Remove Existing Conduit in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.0801	Wood Pole Riser	Each
S671.0802	Replace Wood Pole Riser	Each
S671.0803	Remove Wood Pole Riser	Each
S671.10XX	XX" Concrete Pullbox	Each
S671.1101	Adjust Existing Concrete Pullbox	Each
S671.1201	Relocate Existing Concrete Pullbox	Each
S671.13XX	Replace Existing XX" Concrete Pullbox	Each
S671.1401	Replace Existing Concrete Pullbox Frame and Cover	Each
S671.1501	Remove Existing Concrete/Brick Pullbox	Each
S671.1601	Install Handhole/Pullbox (Furnished)	Each
S671.1701	Adjust Existing Fiberglass/Polymer Concrete Handhole/Pullbox	Each
S671.1801	Relocate Existing Fiberglass/Polymer Concrete Handhole/Pullbox	Each
S671.1901	Replace Existing Handhole/Pullbox (Furnished)	Each
S671.2001	Remove Existing Fiberglass/Polymer Concrete Handhole/Pullbox	Each
S671.2101	Replace Existing 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
S671.5001XX	X" PVC Conduit and Cable	Linear Foot
S671.5002XX	X" PVC Conduit and Cable (Including Excavation and Backfill)	Linear Foot
S671.5003XX	X" PVC Conduit and Cable (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.5101XX	X" PVC Conduit and Cable – in Roadway	Linear Foot
S671.5102XX	X" PVC Conduit and Cable – in Roadway (Including Excavation and Backfill)	Linear Foot
S671.5103XX	X" PVC Conduit and Cable – in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.52	Wood Pole Riser (Including Cable)	Each
S671.60	Salvage Existing Metal Frame and Cover	Each
S671.61	Salvage Existing Luminaire	Each
S671.64	Salvage Existing 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	Each
S671.71	Replace Existing Concrete Light Pole	Each
S671.8001	Install Luminaire	Each
S671.8101	Replace Existing Luminaire	Each
S671.82	Remove Existing Cable	Linear Foot
S671.9001XX	X" HDPE Conduit	Linear Foot
S671.9002XX	X" HDPE Conduit (Including Excavation and Backfill)	Linear Foot
S671.9003XX	X" HDPE Conduit (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.9101XX	X" HDPE Conduit - in Roadway	Linear Foot
S671.9102XX	X" HDPE Conduit - in Roadway (Including Excavation and Backfill)	Linear Foot
S671.9103XX	X" HDPE Conduit - in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.9201XX	Replace Existing Conduit with X" HDPE Conduit	Linear Foot
S671.9202XX	Replace Existing Conduit with X" HDPE Conduit (Including Excavation and Backfill)	Linear Foot
S671.9203XX	Replace Existing Conduit with X" HDPE Conduit (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.9301XX	Replace Existing Conduit with X" HDPE Conduit - in Roadway	Linear Foot
S671.9302XX	Replace Existing Conduit with X" HDPE Conduit - in Roadway (Including Excavation and Backfill)	Linear Foot
S671.9303XX	Replace Existing Conduit with X" HDPE Conduit - in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.9401XX	X" HDPE Conduit and Cable	Linear Foot
S671.9402XX	X" HDPE Conduit and Cable (Including Excavation and Backfill)	Linear Foot
S671.9403XX	X" HDPE Conduit and Cable (Including Excavation, Backfill and Surface Restoration)	Linear Foot
S671.9501XX	X" HDPE Conduit and Cable – in Roadway	Linear Foot
S671.9502XX	X" HDPE Conduit and Cable – in Roadway (Including Excavation and Backfill)	Linear Foot
S671.9503XX	X HDPE Conduit and Cable – in Roadway (Including Excavation, Backfill and Surface Restoration)	Linear Foot

REVISED August 17, 2021