

HIGHWAY LIGHTING SYSTEM.

(REV 8-19-19) (7-20)

ARTICLE 715-1 is deleted and the following substituted:

715-1 Description.

The work specified in this Section establishes routine maintenance and repair items of work for maintaining the highway lighting system, including conventional/standard, high mast, sign, under-deck and special lighting. Not all of the items described herein will appear as bid items in this Contract.

Provide all labor, materials, equipment, and incidentals necessary to repair and maintain the highway lighting system, including all exterior lighting in parking and ramp areas in all rest/service/weigh station facilities (exclusive of building and sidewalk lighting) within the limits of the project. The highway lighting system includes the light poles, bases, luminaires, lamps, starters, ballasts, pull boxes, cable, conduit, substations, expansion joints, protective devices, transformers, control devices and all other related appurtenances as originally constructed and currently maintained by the Department.

Interpret this contract, where no plans are furnished for work and where the term “shown in the plans” is used in these specifications, to mean, “as shown on the Lighting System Maps”.

A license to do business as a certified or registered electrical contractor pursuant to Chapter 489, Part II, Florida Statutes is required. Submit a copy of the license with the bid proposal package. Provide a sufficient number of crews to perform all work required. The Engineer must approve the number of crews provided. Each crew shall consist of a minimum of one journeyman electrician possessing a valid journeyman electrician’s license pursuant to Section 489.5335, Florida Statutes, and a minimum of one electrician’s helper. The journeyman electrician and electrician’s helper must have knowledge, experience, and training in the maintenance and repair of highway lighting systems. At the request of the Department, provide copies of all licenses, certificates, and registrations to document compliance with this Article and provide written proof of knowledge, experience, and training of the journeyman electrician and the electrician’s helper.

Perform all work in compliance with all local licensing requirements and ordinances governing performance of the work. Perform all work in accordance with the laws of the State, all municipal ordinances, all regulations and requirements of the Public Service Commission, the National Electrical Code, the National Electrical Safety Code, the current edition of the Manual of Uniform Traffic Control Devices, the Department’s Design Standards current at the time of the contract letting, and these Specifications. Employees must be familiar with and apply all appropriate safety practices during the life of this Contract. All persons employed under this Contract must have MANDATORY training in the application of “Occupational Safety and Health Standards” (reference 29 of the Code of Federal Regulations, Part 1910.333), relating to “lockout and tagging” procedures.

Provide all maintenance of traffic required to perform any operation covered by this work in accordance with the latest edition of the Department’s Design Standards. Immediately report to the Engineer any fatalities or injuries to either employees or members of

the public and any damage to property occurring during the performance of any of the work described herein.

ARTICLE 715-2 is expanded as follows:

The time frame outlined for submittal of shop drawings in the Standard Specifications is waived to expedite the submittal of said drawings for Department approval and not delay completion of the work.

ARTICLE 715-2 is expanded by the addition of the following new Subarticles:

715-2.1 Lighting System Mapping: System Mapping is the one-time inspection and preparation of a plan or map of each field location (pole location, service point, pull box, under-deck fixture location, and lighted sign) in the highway lighting system. System mapping includes the marking/tagging of all poles and service points.

Prepare the lighting system map containing the following information.

1. The roadway as related to true north.
2. The location and numbers of all the load centers, circuits and all associated lighting structures and all pull boxes.
3. Identify all the interchanges.
4. Each service point location must contain the load center number, type voltage, type phase, size of wire, number of lights, and breaker amps.
5. Identify bridges by Name and Bridge Number.
6. Number the light pole foundations without the light poles when numbering the light poles in a circuit. Although numbers will not have to be placed on the foundation, include all the information listed above in the lighting system map as if a light pole was in place.

Lighting system mapping will be considered complete when the new maps are received, inspected, and approved by the Engineer. Submit the lighting system maps to the Department at the end of this Contract.

System Re-mapping is the one-time inspection and updating of the existing plan or map of each field location (pole location, service point, pull box, under-deck fixture location, and lighted sign) in the highway lighting system. Include the marking/tagging of all poles and service points using the existing method of marking/tagging when updating the system mapping.

After the initial start of the contract period, updating of the system mapping will be incidental to the related contract items and not be compensated separately.

Marking/tagging of poles and service points must consist of installing or attaching the appropriate numbers, as directed by the Engineer, to all lighting structures. The numbers will be provided by the Department to be installed at each location. Provide all labor and equipment for the installation.

The placement of pole numbers will be performed in the following manner:

1. The load center will be turned on first and numbered.
2. Once all the circuits are on, turn off one circuit at a time and proceed to number all light poles (including bridge mounted), high mast poles, sign structures, and under-deck lights in that circuit. This procedure will be repeated until all circuits are numbered.

SUBARTICLE 715-3.2 is expanded as follows:

When substitutions are proposed for existing systems, they must be both functionally and aesthetically compatible with the existing components and approved in advance by the Engineer.

All materials and equipment needed to perform the maintenance service work must be on hand at all times. The storage site or sites must be outside the right-of-way limits of any state maintained highway; however, materials may be temporarily stored on the right-of-way outside of the clear recovery zone for a period not to exceed 24 hours, if approved by the Engineer. No materials or equipment may be stored in medians.

Equipment used on this project will comply with Section 100 of the Standard Specifications unless otherwise amended by these specifications. Comply with the requirements of "Occupational Safety and Health Standards" (reference 29 of the Code of Federal Regulations, Part 1910); "Mobile and Locomotive Cranes" (American Society of Mechanical Engineers International, ASME B30.5); "Vehicle Mounted Elevating and Rotating Devices" (American National Standard Institute, ANSI/SIA A92.2).

ARTICLE 715-3 is expanded by the addition of the following new Subarticles:

715-3.3 Patrolling and Inspection of System: Patrol and inspect the entire lighting system as directed by the Engineer. Identify each outage by pole number and complete the inspection report form provided by the Engineer. Give the inspection report to the Engineer at the end of each patrol. Patrolling and inspection of the entire system will be performed approximately, 12 times per year; however, this is estimated and is not guaranteed. The Engineer will determine the final number of patrols.

The Engineer will issue the necessary work documents, upon receipt of the inspection report.

715-3.4 Reporting: Report to the Engineer each day the location and work to be performed.

Furnish detailed daily fieldwork performance report forms to the crews. Fill out the daily fieldwork performance reports on every location, giving a complete description of work performed, pole number, location by grid map or nearest count to a ramp or bridge, and a complete description of problem(s) corrected. Report the total man-hours worked at each location. Describe any remaining problem(s) to be corrected by another service crew on the daily fieldwork performance report.

Submit to the Engineer at the end of each week, a summary report (in triplicate) of the daily fieldwork performance reports and a copy of the daily fieldwork performance report forms. Upon verification, the Engineer will sign and return two copies of the summary report.

Meet with the Department's authorized representative monthly to discuss any subjects pertinent to this Contract. The Department may call additional meetings as needed.

715-3.5 Salvaged Materials: All replaced poles and parts remain property of the Department, unless otherwise determined by the Engineer to have no salvage value. Deliver all salvaged materials to the storage sites identified by the Engineer. Salvaged and/or repaired materials may be required to be used, as well as other materials furnished by the Department in

completing various tasks under this Contract. Payment for the installation of salvaged items includes the cost of delivery from the storage sites to the job sites.

Provide environmentally safe areas to dispose of materials determined by the Engineer to have no salvage value. Provide documentation of proper disposal of all removed components containing mercury. Material disposal will be in accordance with applicable Federal, State, and local regulations. The cost of disposal of materials shall be included in the removal or replacement pay item(s).

715-3.6 Emergency Work: Be responsible at all times, including after normal work hours, weekends, and holidays, for removal of downed poles or mast arms impeding traffic or threatening the public, and for the repair of the electrical system in a way that prevents electrical shock to the public, the Department, and their work force.

Provide a contact person 24 hours-per-day and 7 days-per-week (including all holidays) to receive and respond to verbal and written work directions for the duration of this Contract. This person shall be available to meet with the Engineer or designated representatives as needed and will be required to respond (either in person or by telephone) within fifteen (15) minutes of being called or paged. Continuously keep the Engineer advised as to the operable telephone number of the contact person and require that person to continuously be available through an electronic paging device or other methods approved by the Engineer. After notification, report to the emergency work site location(s) within one hour.

715-3.7 Major Repairs: Major Repairs will be the replacement or repairing of damaged, missing light poles, foundations, transformer bases, luminaires, mast arms, buried cable, conduit between poles, high mast lowering devices, including wiring (re-wiring), all hardware, covers, caps, splices, and related parts necessary to make a complete replacement installation.

Replace light poles damaged by traffic within five working days from date of work document issuance or seven days if new poured-in-place (Subarticle 715-6.3) foundations are required. Expedite the preparation of shop drawings, where shop drawings are required, and pole assembly order so as not to cause a delay in its replacement. Take immediate action to protect the safety of the traveling public by removing any elements of the pole assembly that may cause a hazard. The precautionary work occurring at times other than normal work hours will be compensated as work specified under Subarticle 715-3.6. Work under major repair will include the removal of the damaged parts and debris.

Replace poles as originally constructed or by an alternate method approved by the Engineer. All work will be in accordance with Article 715-10 unless otherwise amended by these specifications.

The Engineer will authorize, through a written work document, all major repairs.

Pay items are prepared to allow payment for the complete assembly or for assembling a pole from a combination of various usable salvaged components and new components.

715-3.8 Routine/Minor Maintenance: Routine/minor maintenance is defined as periodic cleaning, repairing or replacing of items as scheduled by the Engineer to assure the optimum performance of the lighting system and to prevent a system failure.

Depending on the work described (i.e., pole sign assembly, under-deck fixture, circuit, etc.) the following items must be cleaned, repaired, or replaced when a Routine Maintenance work document is issued by the Engineer:

1. Hardware such as hinges, latches, fasteners, locks, snaps, cover plates, inspection plates, pole caps, nuts, bolts, washers, ground wire for metal pull box covers, and other small components.

2. Bird guards and reflectors.

3. Gaskets and filters.

4. Electrical shorts not requiring replacement of buried cable.

5. Lamp and photocell sockets (waterproof).

6. Tree trimming to allow servicing of lights.

7. All pole or structure wiring (usually No. 10 wire) from the luminaire to the supply cable connection.

8. Signing Bracket Arm.

9. Leveling of under-deck light fixture or pole mast (bracket) arm.

10. Cleaning refractors (Glassware).

11. Pea rock in pull boxes.

12. Electrical putty on ends of conduit.

13. Lamps.

14. Ballast assembly.

15. Refractors (glassware).

16. Grounding wires and rods.

17. Fuses, Fuse Holders, High Mast Pole Breakers, Safety Switches, Surge Protectors, Sockets, and other such Electrical Components.

Whenever the above listed items have been vandalized, rusted, oxidized, missing, frayed, defective, damaged, or have stopped functioning for whatever reason, the repairing, cleaning, or replacing will be defined as routine maintenance.

Replacing, cleaning, or repairing of routine maintenance items 1 through 12 above will be accomplished when performing diagnostic or routine/minor maintenance work on each assembly. No separate compensation will be made for the above items since the work will be included as part of the applicable routine maintenance or diagnostic work pay item.

Items 13 through 17 above will be paid under the individual component pay items for accomplishing the work; however, the work will be accomplished during routine or diagnostic work without the issuance of an additional work document.

715-3.9 Diagnostic and Repair Work: Perform diagnostic work on all non-functioning luminaires, load centers, and circuits as identified on the work document.

Make repairs at the time of the diagnostic inspection if the problem is determined to be a routine or minor maintenance item as defined in Subarticle 715-3.8.

Materials used and labor involved in the repair will be paid under diagnostic work or the appropriate component pay item.

If the problem is determined to be major repair, as defined in Subarticle 715-3.7, report such to the Engineer and begin work only when the Engineer issues a work document.

In either case, submit a Diagnostic Work Report to the Engineer detailing the required work.

Begin diagnostic work within 24 hours of receipt of a work document issued by the Engineer, unless otherwise specified by the Engineer.

715-3.10 Maintenance Servicing and Repair Standards: Standards for maintenance servicing and repairs will include inspecting, checking, cleaning, or replacement items

considered minor in scope. Routine maintenance will be paid as either routine maintenance or diagnostic work as defined elsewhere in these specifications.

715-3.10.1 Luminaire: Inspect luminaries for rust or oxidation and replace with a new luminaire if damaged or missing.

715-3.10.2 Lamps: Check lamps for looseness. If the lamp is loose, remove and inspect the socket. Repair or replace lamps or lamp sockets operating improperly.

Lamps used on this contract must meet or exceed the minimum industry standards for power consumption, life expectancy, and amount of light output as defined in the American National Standards Institute (ANSI), Section C78. Lamps must be compatible with existing field hardware such as ballasts, starters, luminaires, wiring, etc., without extensive modifications or additional parts.

Visually check new lamps for defects before installation. Mark the base of all new lamps showing the date of installation using the scratch numbers and letters provided on the pole base to facilitate the identification of installation dates for warranty and inspection purposes.

Group Re-lamping shall be the large-scale routine replacement of lamps in a circuit, entire roadway section, or all lamps within the limits of the Contract as directed by the Engineer.

715-3.10.3 Glassware or Plastic: Clean refractors (glassware) when any routine maintenance function is performed on an assembly without additional compensation. The cost of cleaning the refractor(s) will be included in the related pay item(s).

Remove, wash, rinse twice and dry refractor glassware. Brush and remove bugs from the fixture and the reflector. Unfasten and clean with compress air the second portion of the hinged-door fixtures. Do not disturb the wires while removing debris.

Replace glassware in need of replacement with the same type and pattern as removed. Glass refractors may be replaced with plastic refractors when approved by the Engineer.

715-3.10.4 Reflectors: Clean and/or polish the inner surface of reflectors with removable polish, rather than by using water. If reflective qualities cannot be restored, the reflector will be replaced. If the reflector cannot be purchased, a complete, new fixture must be installed.

715-3.10.5 Gaskets and Filters: Clean foreign material, oxidation, and spray with a special treatment to stop oxidation and sticking of all neoprene or silicon gaskets. Replace all gaskets not functioning properly. Replace all felt or dacron gaskets with dacron sutron gaskets of the proper thickness and width to form a weather resistant seal. Glue gaskets with non-hardening material and install correctly to prevent entry of insects. Filters will be checked and replaced when necessary.

715-3.10.6 Bird Guards: Replace bird guards if missing or damaged. Devise and install new bird guard if bird guards are not available to fit the specifications of the existing fixture.

715-3.10.7 Hinges and Latches: Repair hinges and latches according to the manufacturer's specifications. Replace the fixture or part of the fixture on which the hinge or latch is located if parts cannot be repaired.

715-3.10.8 Fasteners and Snaps: Replace all fixtures having broken fasteners or snaps that cannot be repaired or replaced, with fixtures meeting the Department's current design criteria. The Engineer must approve replacements.

715-3.10.9 Leveling: All fixtures shall be level. Shim the pole base so the pole will be vertical.

Bring the head to proper alignment by adjusting the adjustable mast arm. Use the leveling device in the head to adjust the fixture on a non-adjustable mast arm.

715-3.10.10 Mast Arms: Inspect for rust or oxidation and replace mast arm if beyond repair. Reposition or replace bent or incorrectly positioned mast arms.

715-3.10.11 Photoelectric Cells: Check for proper on/off cycling of all photoelectric cells, whether on the fixture, pole, or remote. Replace any photoelectric cell failing to turn on at proper time. Obtain permission from the utility pole owner prior to inspecting the photoelectric cell for continuity. Only photoelectric cells and the associated contacts that are owned by the Department are included in this Contract.

715-3.10.12 Sockets: Replace photoelectric cell sockets that are defective. Replace defective amp sockets or socket holders. Correct improper connections.

715-3.10.13 Hand Hole Plates: Check, repair, or replace where necessary all hand-hole plates (door assemblies). Replacement with nonmetallic plates may be allowed, if approved by the Engineer. Determine the size of the hand-hole plates.

715-3.10.14 Wiring

Luminaries: Perform wiring/re-wiring, as needed, on the integral ballast using methods prescribed for wiring in high heat environments and using materials that will withstand high temperatures. Replace the luminaire when repairs are too extensive for completion in the field. All repairs must conform to manufacturer's specifications.

Pole Risers: Re-wire the pole when chaffing, shorting, or openings that could affect the operation of the luminaire exist in the pole riser conductors. Conform to the wire size in the Design Standards when wiring/re-wiring poles.

Maintain lightning protection by connecting all metal components, i.e., luminaire housing, bracket arm, etc., to the associated ground rod at the base of each pole meeting the Design Standards. The current carrying neutral wire is connected to ground at the distribution panel.

Grounding Wires: All grounding wiring must be in accordance with Section 620 and Article 715-11.

Pole Bases/Electrical: Weatherproof, pull-apart connectors are required at all poles. Properly install vulcanize as necessary, lubricate with a non-conductive lubricant, seal, and protect from chaffing weatherproof, pull-apart "Y" fused connectors, in-line, pull-apart, weatherproof, connectors are authorized provided connections are made with compression sleeves, split bolts, or are soldered before being made weatherproof.

Place fuse inserts in the "hot leg" of the pole riser. Place blank conductor inserts in the neutral leg of the pole riser. Fuse both legs where there is no neutral conductor.

Leave sufficient slack in all wires to allow the wire and connectors to be pulled and worked on outside the hand hole.

Seal with electrical putty the ends of the conduits.

Circuit Current Carrying Conductors: Install wire that meets the National Electrical Code, Florida Department of Transportation Standard Specifications for Road and Bridge Construction and is consistent with the existing lighting system. All new underground wiring must be installed in duct or conduit. Place conduit in trenches with vertical walls at a minimum depth of 32 inches with warning tape at a depth of 20 inches. Use non-

conductive lubrication and pulling aids when pulling new conductors into existing ducts to avoid damaging the insulation.

Distribution Boxes: Be responsible for the distribution box or circuit breaker panel board enclosure, which controls the lights in this Contract and provide a padlock with a type of lock specified by the Engineer. Furnish an extra padlock key to the Engineer.

Foundations. Straighten, repair, or re-pour the foundations in accordance with the current Department Standard Plans. The Engineer may permit the use of pre-cast foundations. Provide environmentally safe areas to dispose of existing foundations removed.

715-3.10.15 Ballasts: Check and replace if defective all ballasts. Replace new ballasts with the regulator type and wire for the appropriate voltage.

715-3.10.16 Fuses: Fuses are located as part of the pull-apart connectors either in the pole hand-hole or in the transformer base. Lubricate the pull-apart connector with non-conductive lubricant whenever the fuse is checked. Replace blown fuses with dual element, 600V 10 Amp, type FNQ or equivalent. Replace blown fuses caused during testing repaired circuits as provided in Article 715-14 at no cost to the Department.

715-3.10.17 Grounding: Ground all poles. Meet the grounding requirements of Section 620 and Article 715-11 and the Department's Standard Plans..

715-3.10.18 Transformer Base: Replace the doors of the transformer base if missing. Remove broken bolts and re-tap holes. Use stainless steel bolts to hold the door securely in place and to protect the inside of the base from the elements and unauthorized persons. Clean the inside wall of the base and the surface of the concrete foundation using compressed air. Disconnect, clean, lubricate, and reconnect pull-apart connectors in all transformer bases in accordance with Subarticle 715-3.10.14.

Replace all transformer bases that have cracks or any structural damage with an equivalent transformer base as directed by the Engineer.

715-3.10.19 Poles: Replace pole caps, inspection plates, or hand-hole covers if missing. Bolts missing or broken must be replaced or removed, the holes re-tapped and stainless steel, tamper proof bolts replaced in proper position.

Replace with new wire any portion of the riser wire going from the base of the pole to the socket in the head of the fixture if frayed or damaged. Plug conduit coming out of the foundation with electrical putty.

Shim the base of the pole if leaning to return it to proper position. Replace the pole if bent. Repair damaged poles if possible, by replacing the damaged shoe base and pole section with replacement parts so that mast arm position and hand-hole position remain per design. Retain breakaway capability. Provide environmentally safe areas to dispose of damaged poles having no salvage value, as determined by the Engineer.

715-3.10.20 Sign Lights and Under Deck Lights: Apply the following requirements of Subarticle 715-3.8, where applicable:

Fixture: Keep all fixture drain holes open and filtered. Maintain position of luminaires to afford optimum illumination of the sign face.

Gaskets: Properly treat and seal gaskets each time the fixture is service.

Ballasts: Replace defective ballasts with ballasts of the regulator type and wire for the appropriate voltage. Any ballast in a location that is difficult to service may be relocated on the structure for easier accessibility with the approval of the Engineer.

ARTICLE 715-16 is expanded as follows:

All repair parts and hardware for which a pay item is not listed in these specifications are incidental to the Routine Lighting Maintenance or Diagnostic Work pay items.

Pay items to install will be for payment of all or part of the pole assembly components that are reused without repairs of any kind or when the Department furnishes components.

Pay items to remove will include labor, transportation, and equipment cost to remove an in-place pole or component as directed by the Engineer.

Removal of defective poles or components will be included in the item for the replacement of the pole or component.

Payment for removal or relocation of lighting pole foundations [Item Number 0715-10-5 and 0715-10-6] will include all backfill material and provide areas for proper disposal of the foundations

Pay items to rework will be for payment of repairing pole assemblies in the field due to knockdowns, vandalism, adverse weather, or other causes. Use this item alone, when replacing or repairing components that do not have a separate pay item (e.g., pole wiring, base plate flange, etc.), if such repair is deemed appropriate.

When repairs involve other components, this item will be used with those component pay items. Payment under this item includes transportation, storage, labor, miscellaneous minor materials, and equipment to perform the complete operation, clean up, and disposal of debris.

Payment for grounding will be per foot of electrode furnished and installed and will include the ground rod electrodes, coupling devices, grounding conductors, and connecting devices plus all labor equipment and miscellaneous materials necessary for a complete and accepted installation of ground rod assemblies or arrays.

Payment for grounding of all metal conduit runs shall be included in the conduit pay items.

Do not use payment for grounding with a complete pull box installation [Item Number 0715-14-ab].

Used or repaired luminaires or salvaged components may be used. No separate payment will be made for reuse of miscellaneous salvaged parts except as may be paid under Item 0715-5 that includes bracket arms. Bulbs, starter boards, refractors, and ballasts will be paid for when procured new and used to repair a luminaire. New luminaires installed will have all new components including lamps, starter boards, ballasts, and refractors.

The pull box pay item includes the cost of site preparation, restoration, required ground rod and clamps, materials, labor, and equipment to make a complete and acceptable installation. Repair work to the pull box will include grounding of ungrounded cast iron cover and/or repair of pull box contents. Replacement components for high mast lighting must be new, unless specified otherwise by the Engineer.

Lowering Cable, per each, is defined as a continuous length of cable and appropriate terminal (connecting) hardware for each cable (the winch cable and three or more ring lift cables).

Power cable is the electrical riser cable terminal plug that connects to the power lead at the bottom and luminaire ring at the top of the high mast pole.

The winch is the gear and drum mechanism located in the bottom of the pole used to raise and lower the luminaire ring.

The luminaire support ring is a circular structural member complete with rollers or bumpers which spaces and supports the luminaires and includes all power cable termination hardware and attachment points for the lift cables.

A pulley assembly is one set of pulleys and mounting hardware installed at the top of the pole to handle one lift cable.

The complete lowering assembly is all of the above items arranged in sufficient quantity and in a way that constitutes the entire lowering assembly (power unit not included). Ballast assemblies shall include starter and capacitor.

Do not use Pay Item E715-17-a Lamps with pay items for new luminaires [0715-5-AB or 0715-11-ABC] or for group re-lamping as described under Item No. E715-30. The bid item for each lamp type shall cover all required wattage of lamps of that type.

Payment for Load Center Parts shall be for furnishing and/or installing new circuit breakers, breaker panels with enclosures, and other load center equipment of the type required to replace damaged and malfunctioning units including miscellaneous wiring or re-wiring as necessary.

Use Pay Item E715-21-AB Luminaire to pay for furnishing and installing a complete new fixture. Use Pay Item E715-23-AB Refractors to pay for the installation of new refractors only.

Payment for Emergency Work shall be on a per call basis for furnishing a full time on-call emergency response contact person and responding to an Emergency as specified in Subarticle 715-3.6. Maintenance of traffic and temporary repairs necessary to restore the location to a safe and acceptable condition until permanent repairs can be made is included in the payment for this item. Permanent repairs will be compensated as routine, diagnostic, or major work as appropriate.

Payment for System Mapping or System Re-mapping shall include the one time field inspection or re-inspection of each field location in accordance with Subarticle 715-2.1. The cost of the preparation of field diaries and miscellaneous reports is included in System Mapping or System Re-mapping.

Payment for System Patrolling shall be for supplying the necessary equipment and trained personnel to periodically patrol, inspect, and prepare inspection reports identifying any lighting system irregularities. The Contract planned quantity is an estimate based on the number of patrols or inspections required by the Contract and it is not guaranteed. Payment will be based on the actual number of patrols or inspections authorized by the Engineer.

Payment for Group Re-lamping shall include the routine replacement of groups of lamps of a particular type as opposed to the replacement of individual defective lamps as performed under Item E715-17. The quantity of work shown in the bid documents is not guaranteed and will be dependent on the condition of the system, and as determined by the Engineer. The bid item for each lamp type shall cover all required wattage of lamps of that type.

Payment for Routine/Minor Maintenance as defined in Subarticle 715-3.8 will be paid based on each location (i.e., pole sign assembly, under-deck fixture, circuit) for which work has been approved by the Engineer.

Payment for Diagnostic Work as defined in Subarticle 715-3.9 will be paid based on each location (i.e., pole, sign assembly, under-deck fixture, circuit) for which work has been approved by the Engineer. When routine maintenance work is performed together with the diagnostic work effort to correct a system failure, it shall be compensated under the item of diagnostic work and not duplicated for payment under the routine maintenance work item.

Payment for providing new or repairing and furnishing for reuse repaired lighting pole shafts (Conventional/Standard) up to 50 feet in length will be made under item 0715-34-A. Furnish all hardware necessary to repair poles. Payment will be made only for furnishing new or repaired poles from the job stockpile. Payment will not be made for repaired or new poles until they are reinstalled.

Payment for Mast Arms will be for providing new or repairing and re-installing existing mast arms (Conventional/Standard) up to 15 feet in length. Where no distinction is made in the pay item for different design types of mast arm material, the pay items provided will be full payment for work accomplished. Payment will be made only for repaired (or new) mast arms used from the job stockpile. Payment will not be made for new or repaired items until they are reinstalled. This item will not be used when a mast arm in the field is repaired, reinstalled, and paid for under a "pole assembly" item.

Payment for furnishing and installing a continuous phase transformer, including the removal and disposal of the existing transformer, all re-wiring, necessary hardware, and labor will be paid under item E715-50-abc. The voltage shall match the existing load center conditions.

ARTICLE 715-17 is deleted and the following substituted:

Prices and payments will be full compensation for all work specified in this Section, including all materials, equipment, and tests.

No payment will be made until appropriate tests of the installation(s) have been completed as provided in Article 715-14.

Payment will be made under the items specified in the Bid Price Proposal.