

Special Specification 6191

Maintenance of Illumination Systems



1. DESCRIPTION

Maintain, furnish, install, modify, repair, replace, or remove components of illumination systems.

2. MATERIALS

Unless otherwise noted on the plans, the Department will furnish roadway illumination assemblies; poles, transformer bases, mast arms, and fixtures that will become part of the final installation. Submit a material list to the Engineer for the Department furnished materials needed. Pick up materials at the locations and times shown on the plans. Designate in writing the persons authorized to pick up the material. Furnish all other materials.

Assume responsibility for all materials furnished by the Department. Use material furnished by the Department for this Contract only. Return unused or removed materials deemed salvageable by the Engineer to the Department upon completion of the work and prior to final payment at location shown on the plans or as directed. Dispose of any material deemed not salvageable by the Engineer in accordance with federal, state, and local regulations. When materials are required to be furnished by the Contractor, meet the material requirements of the pertinent Item for the material requirements.

3. EQUIPMENT

Required equipment includes but is not limited to an aerial device capable of reaching overhead work, trenching machine, boring machine, concrete saw, and digger-boom truck. Use only equipment, tools, and machinery in good repair and operating condition. Repair or replace any equipment that, in the opinion of the Engineer, may affect the quality of work or safety. Provide equipment necessary to complete the work. The Department will furnish a power drive assembly for use in lowering and raising the high mast rings. The Contractor will be responsible for the maintenance of the power drive assembly including maintaining the proper torque setting on the clutch. Return the power drive assembly in good condition upon completion of the contract. Supply a 110 volt power supply for the drill motor.

4. WORK METHODS

Conform to the NEC, local utility requirements, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 416, "Drilled Shaft Foundations,"
- Item 432, "Riprap,"
- Item 447, "Structural Bolting,"
- Item 610, "Roadway Illumination Assemblies,"
- Item 614, "High Mast Illumination Assemblies,"
- Item 618, "Conduit,"
- Item 620, "Electrical Conductors,"
- Item 621, "Tray Cable,"
- Item 622, "Duct Cable,"
- Item 624, "Ground Boxes," and
- Item 628, "Electrical Services."

Perform the following work as directed

- 4.1. **Foundations.** Install drilled shaft foundations in accordance with Item 416, "Drilled Shaft Foundation," as shown on the plans, or as directed.
- 4.2. **Riprap.** Install riprap around the foundation in accordance with Item 432, "Riprap," as shown on the plans, or as directed.
- 4.3. **Roadway Illumination Assemblies.** Install, relocate, or remove roadway illumination assemblies in accordance with Item 610, "Roadway Illumination Assemblies," as shown on the plans, or as directed.
- 4.4. **High Mast Illumination Assemblies.** Replace high mast illumination assemblies and meet the requirements of Item 614, "High Mast Illumination Assemblies," as shown on the plans, or as directed.
- 4.5. **Conduit.** Install, replace, remove, or modify conduits in accordance with Item 618, "Conduit," as shown on the plans, or as directed. Use 90 degree "sweep" type elbow on conduits entering a ground box or foundation.
- 4.6. **Electrical Conductors.** Install electrical conductors in accordance with Item 620, "Electrical Conductors," as shown on the plans, or as directed.
- 4.7. **Tray Cable.** Install tray cable in accordance with Item 621, "Tray Cable," as shown on the plans, or as directed.
- 4.8. **Duct Cable.** Install duct cable in accordance with Item 622, "Duct Cable," as shown on the plans, or as directed.
- 4.9. **Ground Boxes.** Install, repair, replace, remove, or modify ground boxes in accordance with Item 624, "Ground Boxes," as shown on the plans, or as directed.
- 4.10. **Electrical Services.** Install or remove electrical services in accordance with Item 628, "Electrical Services," as shown on the plans, or as directed.
- 4.11. **Breakaway Base Inspection and Repair.** Conduct one base inspection of each luminaire pole to be maintained by this contract. Begin base inspections within 30 calendar days of the award of the contract and work continuously, Monday through Friday, a minimum of 8 hours per day (weather permitting), until all bases have been inspected.
- Inspect each base for damage, missing doors, and tightened bolts. Tighten the bolts in accordance with Item 447, "Structural Bolting." Replace missing transformer base doors. Replacing doors and tightening bolts will not be paid for directly but is subsidiary to the various bid items of the contract. Submit an inspection report for each base to the Engineer, upon completion of the inspection.
- Replace damaged transformer bases. Replacement of transformer bases will be measured and paid for in accordance with Item 610, "Roadway Illumination Assemblies."
- 4.12. **Maintain Illumination Systems.** Perform maintenance to the illumination systems at the locations shown on the plans. Maintain the required operational levels.
- Perform maintenance work continuously until all circuits are restored to 100% of all luminaires operating.
- Upon completion of this work maintain a minimum operational level of 96% for all luminaires or 90% of luminaires powered from one electrical service point. Perform repair/replacement work within two business days when the number of luminaires operating properly falls below that outlined above.
- Should the level of operation drop below 93% overall or 80% from any one electrical service, the bid item will be paid for at a pay factor of 0.80. The unavailability of Department-furnished materials will not be cause for decrease of pay factor.

Should the operational level drop below 90% overall or 76% on any one electrical service for a period exceeding two days, the Department will have the work done by someone other than the Contractor to obtain the 96% or greater operational level. This work will not change the responsibilities set forth in this Item. The cost of this work will be deducted from any monies due to the Contractor, or to become due the Contractor.

The Department will conduct a monthly drive through to determine the operational level for the illumination systems. The level will determine the pay factor. The Department will notify the Contractor of any needed repairs. Lamps experiencing end of life cycling will be counted as a non-operating luminaire.

The operational level will be calculated by the following formula:

Operational Level = Operating Luminaires/total number of luminaires maintained by contract.

Repairs or replacements made necessary as the result of damage caused by a person, other than the Contractor's personnel, including damage due to theft, automobile crash, or others digging in the area will not be considered normal maintenance under this item and will be paid separately under the various bid items of the contract. Maintain lighting system components of the various types:

- 4.12.1. **Maintain Pole Mounted Luminaires.** Replace lamps, fuses, fuse holders, fixtures, T-base doors, and any other work required to keep the luminaires in operation. Clean the glass cover (both inside and outside) and the reflector with an approved cleaning solution.
- 4.12.2. **Maintain Underpass Luminaires.** Replace lamps, fuses, fuse holders, fixtures and any other work required to keep the luminaires in operation. Clean the glass cover (both inside and outside) and the reflector with an approved cleaning solution.
- 4.12.3. **Maintain High Mast Lights.** Lower the ring assembly and replace lamps, fuses, fuse holders, photocells, ballasts, and any other work required in keeping the lights operational. Clean the glass cover (both inside and outside) and the reflector with an approved cleaning solution. Maintain, repair or replace the circuit breaker at the base of the pole, add oil to the winch when required, and adjust the winch brake when required. Make a visual inspection of the foundation, poles, anchor bolts, base plate, access door, winch, wire rope including cable attachment plate and cotter pins, electrical power cable, and fixture mounting ring. Complete an inspection record, supplied by the Engineer, detailing the visual inspection and noting any discrepancies including other discrepancies noted but not listed above. Maintenance of high mast poles does not include the repair or replacement of the ring assembly, poles, winch, power cable, wire rope, foundation, anchor bolts, or anchor bolt nuts, except for the visual inspections required above, unless those items are damaged by the Contractor's personnel. The essential parts (winch, power cable, wire rope, etc.) which are found to be damaged or which failed prior to inspection shall not be raised back into position until repaired and/or raised with the approval of the Engineer.
- 4.12.4. **Maintain Electrical Service.** Replace the photo electric control, breakers, fuses, contactor, hand-auto switch, breaker panels, and all other electrical components of the electrical service, when required, in accordance with the Electrical Details (ED) Standard Sheets.
- 4.13. **Emergency Call.** The Department will notify the Contractor if a situation requires an emergency call out. Respond within 6 hours after notification of emergency situation.

5. MEASUREMENT

This Item will be measured as follows:

- 5.1. **Foundations.** By the foot to the bottom of the shaft.
- 5.2. **Roadway Illumination Assemblies.** By the each roadway illumination assembly installed, relocated, or removed.

- 5.3. **High Mast Illumination Assemblies.** By each assembly.
- 5.4. **Conduit.** By the foot of conduit.
- 5.5. **Electrical Conductors.** By the foot of each single conductor.
- 5.6. **Tray Cable.** By the foot of tray cable.
- 5.7. **Duct Cable.** By the foot of duct cable.
- 5.8. **Ground Boxes.** By each ground box complete in place.
- 5.9. **Electrical Services.** By each electrical service installed or removed.
- 5.10. **Breakaway Base Inspection and Repair.** By the lump sum for the inspection of all transformer bases and the replacement of all damaged or missing transformer base doors.
- 5.11. **Maintain Illumination Systems.** By the month at the pay factor determined by operation level.
- 5.12. **Emergency Call.** By each response to an emergency call.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the various designations. This price is full compensation for furnishing material, equipment, labor, fines, tools, and incidentals. The Department will pay for electrical energy consumed by the lighting systems, for electrical repair, concrete, and for labor, tools, equipment and incidentals necessary to complete the work.