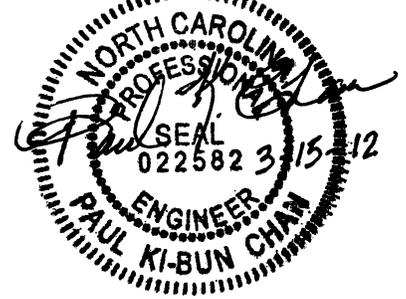


PROJECT SPECIAL PROVISIONS
LIGHTING

1.00 DESCRIPTION

The work covered by this section consists of furnishing, installing, connecting, and placing into satisfactory operating condition roadway lighting at locations shown on the plans. The work involves removing, and/or relocating existing lighting equipment and replacing circuitry. All removed material shall be coordinated with the City of Lumberton Director of Electric Utilities, Lamar Brayboy (910-671-3865), and delivered to the Lumberton Electric Utilities depot at the address below:

Lumberton Electric Utilities
420 Halsey Street
Lumberton, NC 28358

All work shall be performed in accordance with these Special Provisions, the Plans, the National Electrical Code, and North Carolina Department of Transportation "Standard Specifications for Roads and Structures" (Standard Specifications).

Perform all work in conformance with Division 14 of the Standard Specifications except as modified or added to by these Special Provisions. Install all bore pits outside the clear zone, as defined in the AASHTO Roadside Design Guide or as directed by the Engineer.

2.00 HIGH MOUNT FOUNDATIONS

2.10 DESCRIPTION

High mount foundations for high mount standards consist of drilled piers or footings with pedestals, conduit and anchor rod assemblies. Construct high mount foundations in accordance with the contract and either *Roadway Standard Drawings* No. 1402.01 or the accepted submittals. Define "high mount standard foundation" as a drilled pier including the conduit and anchor rod assembly that meets Standard Drawing No. 1402.01.

2.20 MATERIALS

Use high mount foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* provision found in the Roadway Project Special Provisions.

2.30 HIGH MOUNT STANDARD FOUNDATIONS

Construct high mount standard foundations for the wind zone and high mount heights shown in the plans unless the following assumed site conditions are not applicable to high mount locations:

- A. Soil with unit weight (γ) \geq 120 lb/cf and friction angle (ϕ) \geq 30°,
- B. Groundwater at least 7 ft below finished grade and
- C. Slope of finished grade 6:1 (H:V) or flatter.

A subsurface investigation and high mount foundation design are required if the Engineer determines these assumed site conditions do not apply to a high mount location and the high mount cannot be moved. Subsurface conditions requiring a high mount foundation design include but are not limited to weathered or hard rock, boulders, very soft or loose soil, muck or shallow groundwater. No extension of completion date or time will be allowed for subsurface investigations or high mount foundation designs.

2.40 SUBSUFACE INVESTIGATIONS

Use a prequalified geotechnical consultant to perform one standard penetration test (SPT) boring in accordance with ASTM D1586 at each high mount location requiring a subsurface investigation. Rough grade high mount locations to within 2 ft of finished grade before beginning drilling. Drill borings to 2 drilled pier diameters below anticipated pier tip elevations or refusal, whichever is higher.

Use the computer software gINT version 8.0 or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

2.50 HIGH MOUNT FOUNDATION DESIGNS

Design high mount foundations for the wind zone and high mount heights shown in the plans and the slope of finished grade and subsurface conditions at each high mount location. Design drilled piers, footings and pedestals in accordance with the 4th Edition of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

Design drilled piers for side resistance only in accordance with Section 4.6 of the *AASHTO Standard Specifications for Highway Bridges*. Use the computer software LPILE version 5.0 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than 0.5" at top of piers.

Design footings in accordance with Section 4.4 of the *AASHTO Standard Specifications for Highway Bridges*. Do not use an allowable bearing pressure of more than 3,000 lb/sf for footings.

Submit boring logs, working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, required foundation dimensions and elevations and typical sections with reinforcement, conduit and anchor rod assembly details. Include all boring logs, design calculations and LPILE output for high mount foundation design submittals. Have high mount foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

2.60 CONSTRUCTION METHODS

Grade a 3 ft diameter level work area around high mount locations with cut and fill slopes as shown on Standard Drawing No. 1402.01. Construct drilled piers, footings and pedestals and install anchor rod assemblies for high mount foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* provision.

2.70 MEASUREMENT AND PAYMENT

High Mount Foundations will be measured and paid in cubic yards. High mount standard foundations will be measured as the cubic yards of concrete shown on Standard Drawing No. 1402.01 for the high mount height and wind zone shown in the plans. All other high mount foundations will be measured as the cubic yards of foundation concrete for drilled piers, footings and pedestals shown on the accepted submittals. The contract unit price for *High Mount Foundations* will be full compensation for providing labor, tools, equipment and foundation materials, stabilizing or shoring excavations and supplying concrete, reinforcing steel, conduit, anchor rod assemblies and any incidentals necessary to construct high mount foundations. Subsurface investigations and high mount foundation designs required by the Engineer will be paid as extra work in accordance with Article 104-7 of the *Standard Specifications*.

Payment will be made under:

High Mount Foundations.....Cubic Yard

3.00 REMOVE LIGHT STANDARDS

3.10 DESCRIPTION

The work covered by this section consists of the removal of existing metal single arm, twin arm and high mast light standards with concrete foundations at locations shown on the plans. The single arm and twin arm standards are 45' mounting height and high mast standards are 100' mounting height. Single arm and high mast standards are attached to in ground concrete foundations with anchor bolts. Twin arm standards are attached to median barrier concrete foundations with anchor bolts.

Removed high mast light standards will become the property of the Contractor and disposed of in a manner acceptable to the Engineer. Any selected salvaged components of the high mast standards are to be delivered to the Lumberton Electric Utilities depot. Salvage value for the high mast standards shall be reflected as a reduction in the bid price.

Removed single arm light standards to be relocated shall be stored until such time that they are to be relocated in new locations. Removed single arm and twin arm light standards to be turned over to the City of Lumberton shall be delivered to the Lumberton Electric Utilities depot after being removed from foundation. Refer to the plans and the section of these provisions titled "Relocate Light Standard" for more information.

Concrete foundations to be removed or abandoned may be located in areas where, due to knockdowns, there are no light standards to be removed.

The Contractor is responsible for the storage and protection of the materials to be reused against loss or damage.

3.20 MATERIALS

No materials are required for this work except such miscellaneous items as tape and terminal devices to dead-end circuits serving the light standards.

3.30 CONSTRUCTION METHODS

The existing light system shall be left in operation until such time that it becomes in conflict with the actual construction work or it becomes a hazard to traffic as determined by the Engineer.

Coordinate work with the NC DOT Traffic Services Supervisor and the City of Lumberton Director of Electric Utilities to assure that circuits can be de-energized where and when necessary.

In single arm and twin arm standards breakaway fuse holders shall be disconnected from the circuitry. If circuitry connections to the fuse holders are by compression connectors, the connector shall be left intact, and the conductors shall be cut leaving a 12" lead to the connector. Fuse holders shall be delivered in good condition to the Lumberton Electric Utilities depot.

Remove single arm twin arm and high mast luminaires from pole-arms or tenons and deliver the luminaires in good condition to the Lumberton Electric Utilities depot. Coordinate luminaire removal with the Engineer and with the City of Lumberton Director of Electric Utilities.

Remove single arm and twin arm light standard and arms, couplings, anchor nuts, washers, transformer bases with doors and connecting bolts and fuse holders. Use rope or web slings when hoisting or lifting the light standard, to prevent damage or marking. If the single arm light standards are to be stored between dismantling and reinstalling, provide proper transportation and supports to prevent warping. Provide protection against the elements. Removed items to be relocated shall be stored by the Contractor. Removed items not to be relocated shall be delivered to the Lumberton Electric Utilities depot. See plansheet E2 for schedule of relocated single arm and twin arm light standards. The Contractor shall furnish cranes, labor, blocking materials and transportation to unload all salvaged materials at the Lumberton Electric Utilities depot.

Remove high mast light standards and dispose of or recycle in a manner acceptable to the Engineer. The Contractor shall furnish cranes, labor, blocking materials and transportation required to safely lower, dismantle and dispose of the existing high mast standards.

Remove or abandon existing concrete single arm and high mast foundations as defined in Standard Specifications Section 1400-10. Dispose of the removed concrete, reinforcing steel and anchor bolts in a manner acceptable to the Engineer. Backfill the holes with suitable material and compact backfill as required.

Abandon or remove the conductors and the conduit for the removed light standards as shown on the plans. Refer to Standard Specifications Section 1400-10.

Remove all existing circuitry in the median barrier conduit. Removed circuitry shall become the property of the Contractor and shall be disposed of in a means acceptable to the Engineer.

3.40 MEASUREMENT AND PAYMENT

The quantity of removed light standards to be paid for will be the actual number which have been dismantled from existing foundations and accepted or delivered in good condition to the Lumberton Electric Utilities depot.

The quantity of removed foundations to be paid for will be the actual number which have been removed or abandoned and accepted.

The removed light standards measured as provided above will be paid for at the contract unit price per each "Remove Single Arm Light Standard" "Remove Twin Arm Light Standard" or "Remove High Mast Light Standard". Such price and payment will be considered full compensation for disconnecting circuitry, disassembly, storage of the shaft, arm, luminaire, fuseholders, transformer base and hardware or delivery of the shaft, arm, luminaire, fuseholders, transformer base and hardware to in good condition to the Lumberton Electric Utilities depot.

The removed foundations measured as provided above will be paid for at the contract unit price per each "Remove Light Standard Foundation" or "Remove High Mast Light Standard Foundation" that have been removed and accepted. Such price and payment will be considered full compensation for removing or abandoning foundation concrete, reinforcing steel, transformer bases and anchor bolts. It also includes backfilling the holes with suitable material and compacting the backfill material as required.

Payment will be made under:

- Remove Single Arm Light Standard.....Each
- Remove Twin Arm Light Standard..... Each
- Remove High Mast Light Standard Each
- Remove Light Standard Foundation.....Each
- Remove High Mast Standard Foundation.....Each

4.00 RELOCATE LIGHT STANDARDS

4.10 DESCRIPTION

The work covered by this section consists of providing all equipment, labor and materials necessary to move an existing single arm light standard to a new foundation at locations shown on the plans. The standard to be relocated may be near the proposed final location, or may be one removed from another location. Refer to the plans and the section of these provisions titled "Remove Light Standards" for more information. Construction of a new foundation is not included in this section.

4.20 MATERIALS

Reuse existing materials, including the light standard, breakaway base and arm. Shims and washers may be reused, but new connecting bolts are required. Any materials to be reused which are damaged during relocation will be replaced with new materials, at no additional cost to the Department.

If existing transformer bases for relocated single arm standards are damaged prior to the date of availability, the Contractor shall install an acceptable transformer base from one of the three removed light standards at this location. Refer to the plans for these locations, and to Special Provisions titled "Remove Light Standards."

4.30 CONSTRUCTION METHODS

Reassemble and reinstall removed single arm light standards on a new foundation, and reuse the existing breakaway base. Replace the connecting bolts joining the standard to the breakaway base and attachment hardware for the standard-to-arm connection. Install new feeder circuitry as shown on the plans.

Use rope or web slings when hoisting or lifting the light standard to prevent damage or marking. If the light standards were stored between dismantling and reinstalling, provide proper transportation and supports to prevent warping.

Install new luminaire and new conductors inside the standard as detailed in the section of these Special Provisions titled "Replace Luminaires".

4.40 MEASUREMENT AND PAYMENT

The quantity of relocated light standards to be paid for will be the actual number, which have been installed at proposed locations in a satisfactory manner and have been accepted by the Engineer.

Relocated light standards measured as provided above will be paid for at the contract unit bid price per each "Relocate Light Standard". Such price and payment will be considered full

compensation for transportation, reassembly, installation of new connecting bolts, connection of new circuitry and all incidentals necessary to complete the work.

Payment will be made under:

Relocate Light Standard Each

5.00 RELOCATE CONTROL SYSTEM

5.10 DESCRIPTION

The work covered by this section consists of providing all equipment, labor and materials necessary to move an existing control system to a new foundation at the location shown on the plans. It also includes storage of materials to be reused, removal of the existing foundation, construction of a new foundation and replacement of the existing breakers and contactors.

5.20 MATERIALS

Reuse existing materials, including control system enclosure and internal components except as detailed below. Replace materials that are to be reused if they are damaged during relocation. Materials damaged during relocation will be replaced with new materials at no additional cost to the Department.

The Contractor is responsible for the storage and protection of the reused materials against loss or damage.

The Contractor shall provide and install new feeder circuit breakers and contactors.

The existing lightning arrestor installed inside the cabinet shall be removed and reinstalled outside of the cabinet assembly.

5.30 CONSTRUCTION METHODS

The existing light system shall be left in operation until such time that it becomes in conflict with the actual construction work or it becomes a hazard to traffic as determined by the Engineer.

Coordinate work with the NC DOT Traffic Services Supervisor the City of Lumberton Director of Electric Utilities to assure that circuits can be de-energized where and when necessary.

Disconnect circuitry and remove control system enclosure from conduit and support structure, leaving all internal components intact. Abandon or remove underground circuitry, concrete pad and support structure.

All hoisting and lifting shall be with rope or web slings fastened in such a manner as to prevent damaging or marking any of the salvaged materials. The Contractor shall provide proper transportation, protection and supports so that rain, etc. will not damage equipment. The

Contractor shall furnish labor, blocking materials and equipment to unload and properly store all salvaged materials.

Dispose of the removed concrete, reinforcing steel, support structure and conduit in waste areas furnished by the Contractor.

Abandon or remove the conductors and conduit as required by construction. Refer to Standard Specifications Section 1400-10. Install new rigid galvanized conduit above ground and new feeder circuitry as shown on the plans.

See Section 1408 of the Standard Specifications and Standard Drawings for installation of relocated control system and foundation.

Prior to energizing relocated control system, Contractor shall remove existing feeder circuit breakers and mechanically held contactors. New feeder circuit breakers sized as shown on the plans and new mechanically held contactors shall be installed. Removed feeder circuit breakers and contactors shall be delivered to the Lumberton Electric Utilities depot.

The existing lightning arrestor installed inside the cabinet shall be removed and reinstalled outside and on the bottom of the cabinet assembly. Contractor shall tap a hole sized for the lightning arrestor mounting stub and attach arrestor to cabinet using existing lock nuts.

5.40 MEASUREMENT AND PAYMENT

The relocated control system measured as provided above will be paid for at the contract unit price per each "Relocate Control System". Such price and payment will be considered full compensation for disconnecting circuitry, disassembly, transportation, storage, reassembly, installing new connecting hardware and conduit, connection of new circuitry, removal of existing foundation and support structure, disposing of concrete, backfilling, compaction, construction of new foundation and support structure, installation of new feeder circuit breakers and contactors and all incidentals necessary to complete the work.

The quantity of relocated control systems to be paid for will be the actual number which have been dismantled and relocated to new proposed location.

Payment will be made under:

Relocate Control System.....Each

6.00 REPLACE LUMINAIRES

6.10 DESCRIPTION

The work covered in this section involves removing existing luminaires on 100' high mast standards and 45' single arm and twin arm standards and installing new luminaires on all

standards and circuitry inside the single arm and twin arm standards. It also includes numbering the poles with numbers shown in the plans.

6.20 MATERIALS

Provide materials as described in Sections 1400-2 (C), 1403-2 and 1406-2 of the Standard Specifications. Amend the third paragraph of Section 1406-2 to read as follows:

Provide a heat resistant drop-glass prismatic refractor and a reflector with a hard glasslike highly reflective corrosion resistant finish. Use luminaires with IES light distribution of MSC II.

6.30 CONSTRUCTION METHODS

Leave twin arm light standards not removed as part of this contract in tact on the foundations. For all relocated single arm standards and all twin arm standards not removed as part of this contract, remove existing luminaires, fuseholders and circuitry inside the standard. Deliver the luminaires and fuseholders, in good condition, to the Lumberton Electric Utilities depot. Replace single arm and twin arm luminaires with the appropriate luminaires shown in the plans and detailed in the Standard Specification and Standard Drawings. Replace the circuitry inside the standard with type SO cable from the luminaire to feeder circuitry at the base, and replace the breakaway fuseholders.

To lower the carrier ring of the high mast standards, the portable drive unit may be obtained from the City of Lumberton, Director of Electric Utilities. Remove existing high mast luminaires and circuitry inside the high mast standard. Deliver the high mast luminaires, in good condition, to the Lumberton Electric Utilities depot. Replace high mast luminaires with the appropriate luminaires shown in the plans and detailed in the Standard Specification and Standard Drawings. Replace the conductor cable inside the high mast standard from the breaker to the carrier ring and replace conductor cable from carrier ring junction box to high mast luminaires.

Install identifying numbers on each light standard, as shown on Standard Drawing 1404.01, sheet 1 of 3.

6.40 MEASUREMENT AND PAYMENT

The quantity of replaced luminaires to be paid for will be the actual number and type which have been removed from remaining light standards and delivered to the Lumberton Electric Utilities depot, in good condition, and accepted, and have been replaced and accepted with like kind.

Such price and payment will be considered full compensation for disassembly and delivery of the existing luminaires and fuseholders (where fuseholders were used), installation of the new luminaires, new circuitry inside the light standard and carrier ring and new breakaway fuseholders at the base of each single arm and twin arm standard. Numbering each light standard as shown on the plans is also included.

Payment will be made under:

Replace Luminaire (type).....Each

7.00 FOUNDATION COVER

7.10 DESCRIPTION

The work described in this section consists of providing and installing foundation covers on concrete median barrier at specified location as covers for light standard foundation cutouts where twin arm light standards are to be removed.

7.20 MATERIALS

The foundation cover shall be constructed of AISI #304 stainless steel sheet with a minimum thickness of 0.11” (Gauge #11). The Contractor shall field verify the design dimension of the foundation cover to ensure the cover will adequately cover the light standard foundation cutout. The Contractor will adjust the dimension as necessary after field verification and before fabrication.

The grounding lug shall be of the appropriate type and size for the connection of the #8 copper conductor.

Nuts, bolts and washers shall be made from 18-8 stainless steel.

7.30 CONSTRUCTION METHODS

The foundation cover shall be machined fabricated from AISI #304 gauge #11 stainless steel sheet. Dimension of the cover shall be finalized after field verification of the light standard foundation cutout. Dimension for the proposed foundation covers are based on the Light Standard Foundation Type M1 and M2, show in the Standard Specifications and the Standard Drawings Section 1405.

Mount a grounding lug on the inside of the foundation cover with a ¼” stainless steel bolt and nut. The bolt head shall be installed on the outside of the foundation cover while the nut and lock washer are at the inside. The grounding conductor shall be #8, stranded copper and shall have enough lead wire for the foundation cover to be removed and placed on the ground without disconnecting at the grounding lug.

Install two 3/8” stainless steel expansion anchors on top of the concrete median barrier, at an equal distance from the center of the foundation cutout. The maximum protrusion length of these two 3/8” anchor bolts shall be less than 1”. The foundation cover shall be installed on top of the concrete median barrier through the two 3/8 anchor bolts and be fastened down on the anchor bolts with stainless steel nylon lock nut.

7.40 MEASUREMENT AND PAYMENT

The quantity of foundation covers to be paid for will be the actual number fabricated and installed in a satisfactory manner. Such price and payment will be considered full compensation for fabricating and installing the foundation cover, connection of the grounding lead wire, nut, bolts and other incidentals required for installation.

Payment will be made under:

Foundation Cover.....Each

104

**THIS
PAGE
INTENTIONALLY
BLANK**