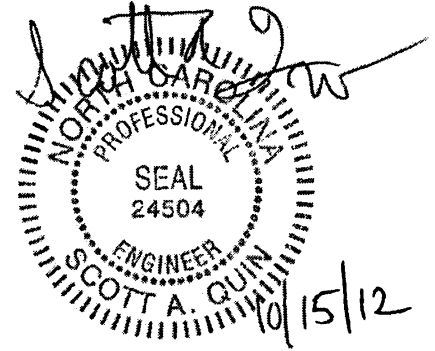


PROJECT SPECIAL PROVISIONS
TUNNEL AND WINGWALL LIGHTING



1.00 DESCRIPTION

The work covered by this section consists of furnishing, installing, connecting, and placing into satisfactory operating condition tunnel and wingwall lighting at locations shown on the plans. The work involves furnishing, installing, connecting, and placing into satisfactory operating condition circuitry and control system.

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)

All work shall be in conformance with Division 14 of the Standard Specifications except as modified or added to by these Special Provisions.

2.00 EXISTING UTILITIES

Locate utilities owned by others as required to complete the work and prevent conflict with construction. Refer to Standard Specification section 1400-4(C). Progress Energy contact information is listed below.

Progress Energy: Robert Metcalf (828-271-3596, office)

3.00 SELECTIVE VEGETATION REMOVAL

3.10 DESCRIPTION

Area surrounding the proposed lighting control system panel requires selective clearing or tree removal before conduits can be routed to the tunnel. Refer to Section 1651 of the Standard Specifications for other details.

3.20 MATERIALS

Refer to Section 1651-2, and as directed by the Engineer.

3.30 CONSTRUCTION METHODS

Amend Section 1651-3 to include limbs and branches, and as directed by the Engineer. Consult with Engineer before beginning any removal operations.

3.40 MEASUREMENT AND PAYMENT

Refer to Section 1651-5 of the Standard Specifications for measurement and payment. Selective Undergrowth to include limbs and branches.

4.00 LIGHT CONTROL SYSTEM

4.10 DESCRIPTION

Work covered in this section shall be in conformance with Section 1408 of the Standard Specification except as modified below.

4.20 MATERIALS

All materials for the Control System, which is rated 120/240 Volts, shall be in conformance with Section 1408-2 and Standard Drawings 1408.01 except as modified below and noted on the plans.

The control relay shall be 120 Volts and shall have an amperage rating of 10 A. The electrically operated, mechanically held contactors shall be 4 pole, 240 Volts with a current rating of 60 A. Both the control relay and the electrically operated, mechanically held contactors shall have 120 VAC coils in lieu of 240 VAC coils. The feeder circuit breakers shall be 1 pole, 120 Volts and have an amperage rating for 20 A. The service circuit breaker shall be 2 pole, 240 Volts and have an amperage rating of 100 A. The control circuit breaker shall be 1 pole, 120 Volts and have an amperage rating of 20 A.

4.30 MEASUREMENT AND PAYMENT

The measurement and payment for each lighting control system installed shall be in accordance with Section 1408-4 of the Standard Specifications.

5.00 TUNNEL AND WINGWALL LIGHTS

5.10 DESCRIPTION

Amend Section 1412-1 of the Standard Specifications to read the following. The work covered by this section consists of installation of tunnel and wingwall luminaires at locations shown in the plans. The work includes attachment of rigid galvanized conduit and galvanized cast junction boxes to the tunnel and wingwalls required to install a complete conduit system for installing conductors to the luminaires. It also includes the use of liquid tight flexible metal conduit for final connection of the circuitry to the luminaires.

5.20 MATERIALS

Amend Section 1412-2 of the Standard Specifications to include the following.

Conduit in exposed areas and buried in earth is rigid galvanized steel in accordance with Section 1091-3 of the Standard Specifications. Use 1" conduit as shown in the plans. Conduit used for final connection of circuitry to luminaire is ¾" liquid tight flexible metal conduit. Use ¾" flex as shown in the plans. Conduit concealed behind the new

wingwall and portal face veneer is ½" rigid galvanized steel conduit. Use ½" conduit as shown in the plans.

Junction boxes are 4" square, 2" deep, galvanized cast boxes. Junction box cover is galvanized and mounted with a gasket and stainless steel screws. Conduits are connected to the junction boxes with galvanized raintight threaded conduit hubs.

Expansion fittings in exposed areas are weatherproof designed for rigid galvanized conduit, with a minimum of four inches of conduit movement, insulating bushings, an internal grounding bonding jumper and a hot dip galvanized finish. For coordination with the veneer, use ½" conduit expansion fittings with the following dimensions: 1.75" diameter, 6.75" long.

Conduit clamps and conduit spacers in exposed areas are mechanically galvanized malleable iron designed for rigid galvanized conduit.

Adhesively anchored threaded rods shall be installed in accordance with Section 420-13 of the Standard Specifications.

Adhesively anchored threaded rods used with luminaire supports are 3/8" in diameter and 3 ½" minimum in length and shall meet the requirements of ASTM F593 alloy 304 stainless steel with minimum 75,000 psi ultimate strength. Nuts shall meet the requirements of ASTM F594 alloy 304 stainless steel and washers shall meet the requirements of ASTM F844 except they shall be made from alloy 304 stainless steel.

Level two field testing is required for adhesively anchored threaded rods used with luminaire supports, per Section 420-13 of the Standard Specifications. The yield load of the 3/8" diameter rods is 2.5 kips.

Adhesively anchored threaded rods used with rigid galvanized conduit and with cast galvanized junction boxes are 1/4" in diameter and 3 ½" minimum in length and shall meet the requirements of ASTM F593 alloy 304 stainless steel with minimum 75,000 psi ultimate strength. Nuts shall meet the requirements of ASTM F594 alloy 304 stainless steel and washers shall meet the requirements of ASTM F844 except they shall be made from alloy 304 stainless steel.

Field testing for adhesively anchored threaded rods used with rigid galvanized conduit and with cast galvanized junction boxes is not required.

Grounding bushings used with rigid galvanized conduit are zinc plated malleable iron, insulated, with tin plated aluminum lugs, steel clamping screws, nylon plastic liners and steel set screws.

Use type THHN/THWN wire for circuitry to luminaires.

Luminaire supports are custom brackets, fabricated from ¼" plate steel and 4" square straight steel pole sections that have a wall thickness of 0.188". Bracket components are

welded together and hot dip galvanized after fabrication. Each bracket will have a ground lug near the removable endcap.

Spare items to be turned over to NCDOT are called out on Sheet E1 of the drawings. Spare mounting brackets, spare optical assemblies with associated LED driver, and spare luminaires are to be turned over to the Division Traffic Service Engineer, Anna Henderson, PE, phone number 828-251-6171.

5.30 CONSTRUCTION METHODS

Amend Section 1412-3 of the Standard Specifications to include the following.

Install luminaire mounting brackets with 3/8" diameter adhesively anchored threaded rods at 2 1/2" minimum embedment.

Install rigid galvanized conduit in exposed areas using clamps and spacers secured with 1/4" diameter adhesively anchored threaded rods at 2 1/2" minimum embedment. Use standard conduit sweeps or field bends as required to install conduit as shown in the plans. Offset conduit at expansion fittings to ensure proper operation and prevent contact with the concrete. Install number and size of conduits as shown in the plans for connection to tunnel and wingwall lights.

Install bonding jumpers at all rigid galvanized expansion fittings.

5.40 MEASUREMENT AND PAYMENT

Payment is for the installation of luminaires, including the luminaire supports. Such price and payment will be considered full compensation for the materials, equipment and labor required for installing luminaires with lamps.

Circuitry will be paid for at the contract lump sum. Such price and payment will be considered full compensation for the materials, equipment and labor required for installing conductors in a continuous conduit system to the luminaires that includes rigid galvanized conduit, galvanized cast junction boxes and liquid tight flexible metal conduit.

Payment will be made under:

Tunnel/Wingwall Luminaire.....	Each
Luminaire Mounting Bracket.....	Each
Circuitry.....	Lump Sum