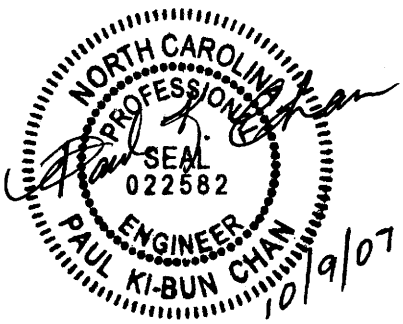

PROJECT SPECIAL PROVISIONS
Rest Area Lighting

1.00 GENERAL

1.10 DESCRIPTION

Provide rest area lighting by installing post top standards with 100 watt metal halide (MH) luminaires, bollard pre-cast concrete light standards with 100 watt MH luminaires, roadway davit style light standard with 250 watt high pressure sodium (HPS) luminaires, underground circuitry in conduit, junction boxes and control systems.

Perform all work 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).

Use Division 14 of the Standard Specifications for materials, construction methods and payment for all work, except as modified or added to by these Special Provisions. Specific sections of the Standard Specifications applicable to the work on this project are listed below:

Section 1405	Standard Foundation
Section 1406	Light Standard Luminaires
Section 1409	Electrical Duct
Section 1410	Feeder Circuits
Section 1411	Electrical Junction Boxes

1.20 ELECTRICAL POWER

Electrical power will be provided through the building electrical service.

2.00 DAVIT STYLE LIGHT STANDARD

2.10 DESCRIPTION

The work covered by this section consists of furnishing and installing light standards complete with davit style arms and 25 or 35 foot mounting height with breakaway bases.

2.20 MATERIALS

Provide a standard that meets the 110-mph design criteria of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." Provide all poles from the same manufacturer.

Provide 25 or 35 foot mounting height, tapered shaft poles with 6-foot davit arms and breakaway base.

The standard shaft shall be one piece round tapered shaft from seamless tubing. The davit arm shall be one piece round tapered that slip fits onto a tapered pole top tenon where it is fastened with stainless steel through bolts. Both shall be designed to support a luminaire with minimum weight, projected area and center of gravity as indicated in the standard specifications for the light standard luminaire.

Provide a protective grommet at the arm-to-pole connection, to protect wiring during installation and maintenance.

Provide a cast aluminum transformer base that complies with AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." Use anchor bolts, washers, nuts and shims which comply with the Specifications and details shown in the plans. Use connecting bolts as recommended by the light standard and transformer base manufacturer(s).

The shaft and the davit arm shall be finished galvanized steel. The finish shall be smooth and shall be free of scratches or dents and shall have suitable protection for handling during erection.

Pole hardware, nuts, bolts, and washers, etc. shall be made from 18-8 stainless steel, or steel conforming to ASTM A307 galvanized in accordance with ASTM A153.

Drawings submitted for approval shall show material specifications for each component and shall have a certification statement concerning conformance with AASHTO design criteria.

2.30 CONSTRUCTION METHODS

Lay out and identify light standards as shown on the plans. Adjust final location as per direction of the engineer to avoid conflicts with other objects. Protect the shaft during storage and installation to ensure against scratches or dents. Use proper blocking and protection to prevent warping or discoloration when laid on the ground, and to prevent damage by other construction work.

Install standards vertically plumb, and use connecting bolts, washers and nuts compatible with the transformer base as recommended by the light standard manufacturer and which comply with the contract. Provide the required luminaire mounting height which is defined as vertical distance from luminaire to pavement surface of traveled lane.

2.40 MEASUREMENT AND PAYMENT

The quantity of light standards to be paid for will be the actual number of light standards with davit style arms and transformer bases that have been installed and accepted.

The quantity of light standards measured as provided above will be paid for at the contract unit price each for " Davit Style Light Standard, _____ " of the appropriate type.

Such price and payment will be full compensation for all work of furnishing and installing the standard with davit style arm and transformer base.

Payment will be made under:

Davit Style Light Standard, MH 25', SA 6'	Each
Davit Style Light Standard, MH 35', SA 6'	Each

3.00 POST TOP LIGHT

3. 10 DESCRIPTION

The work covered by this section consists of furnishing and installing post top light standards with side mounted luminaires and breakaway base.

3.20 MATERIALS

Post

Provide a galvanized steel post top light standard that meets the 110-mph design criteria of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals."

The pole shall be 14 ft in length and a provide nominal luminaire mounting height of 15 ft on a side mount arm when adding transformer base height. The pole shall have a 2" pipe size tenon (2 ⅜" O.D. x 4 ½" minimum length) for mounting the luminaire.

Drawings submitted for approval shall show material specifications, dimensions and shall have a certification statement concerning conformance with AASHTO design criteria.

Luminaire

Provide Kim Lighting, 'The Archetype' Series Luminaire, (1SA/SAR5/100MH208/LG-P/VSF-1SA) w/ Flat Glass Lens, that will produce an IES distribution of Type V cutoff as shown on the plans.

The luminaire shall be rated to operate a 100-watt metal halide lamp at 208 volts AC and shall have a vertical slipfitter mount for attachment to the post.

The finish of the luminaire shall be super TGIC thermoset polyester powder coated in "Light Gray".

The ballast shall be high power factor, constant wattage type suitable to operate metal halide lamps. It shall provide lamp wattage regulation within ±5%, with line voltage variations of ±10%. Ballasts shall be factory wired and tested.

The luminaire shall be UL listed and labeled.

Breakaway Base

Provide a cast aluminum transformer base for each post top light standard that complies with AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." Use anchor bolts, washers, nuts and shims which comply with the Specifications and details shown in the plans. Use connecting bolts as recommended by the post top light standard and transformer base manufacturer(s).

3.30 CONSTRUCTION METHODS

Identify light standards as shown on the plans. Use scaled dimensions to locate light standards. Adjust final location as per direction of the engineer to avoid conflicts with other objects. Protect the shaft during storage and installation to ensure against scratches or dents. Use proper blocking and protection to prevent warping or discoloration when laid on the ground, and to prevent damage by other construction work.

Install all standards vertically plumb, and provide the required luminaire mounting height. The standard should be positioned such that the luminare is pointed in the direction indicated on the plans.

3.40 MEASUREMENT AND PAYMENT

The quantity of post top lights to be paid for will be the actual number that have been installed and accepted.

The quantity of post top standards and luminaires measured as provided above will be paid for at the contract unit price each for "Post Top Light Standard" and "Post Top Luminaire, _____" of the appropriate type. Such price and payment will be full compensation for all work of furnishing and installing the standard, the side mount arm, the luminaire, and the breakaway base.

Payment will be made under:

Post Top Light Standard	Each
Post Top Light Luminaire, _____.....	Each

4.00 LIGHT CONTROL SYSTEM

4.10 DESCRIPTION

The work covered by this section includes the furnishing and installing of all materials necessary to provide a wall mounted lighting control system in a rest area service building as shown on the plans.

4.20 MATERIALS

Provide a 5/8" thick Exterior Grade AD plywood back panel slightly larger than the layout of the control system components.

Provide a 6" x 6" wire trough. The wire trough shall be long enough to accommodate all components and connections. The trough shall be constructed of formed and welded steel that is painted or galvanized, with one removable side plate that is secured in place with corrosion resistant screws, and has only the holes necessary for the conduits shown in the plans. Wire trough with knockouts is not acceptable.

Provide a lighting panel consisting of a surface mount load center, with copper bus, factory installed main breaker, 22,000 Amps short circuit current rating sized as shown in the plans, a minimum of 16 single-pole branch breaker spaces and an equipment ground bar. Use double-pole branch breakers with 10,000 Amps short circuit current rating sized as shown in the plans.

Provide electrically operated, mechanically held contactors with coil clearing contacts. Ensure latching without the use of hooks or semi-permanent magnets. Use contactors rated 208 VAC, 30 amps, with 120 VAC coils and 4 poles each.

Provide a control relay rated 600 VAC, with one normally open contact, one normally closed contact, and "continuous load" rating and "inductive make and break" rating greater than that required by the mechanically held contactors. Install control relay in a NEMA 1 enclosure.

Use a control selector switch rated standard duty, with three positions, and maintained contacts, in a surface mount NEMA 1 enclosure. Provide contacts with an inductive rating of 5 amps continuous, 3600 VA make, and 3600 VA break. Provide a legend plate that indicates "On-Off-Auto".

Use a "dual voltage" photocontrol with surge protection and single pole, single throw, contact with a minimum contact rating of 1000 watts. Provide a normally closed contact that is "daylight energized," with a turn on range of approximately 3 footcandles. Mount the photocontrol in a three-prong locking type receptacle, conforming to NEMA Standard C136.10.

Use number 8 AWG type THHN stranded copper conductors on the line side of the mechanically held contactors, and number 12 AWG stranded copper conductors for the control circuit, conforming to the requirements of Article 1400-2C of the Standard Specifications titled "Wire". Size all other conductors as shown in the plans.

Use rigid galvanized steel conduit in accordance with Article 1400-2B of the Standard Specifications titled "Conduit".

4.30 CONSTRUCTION METHODS

Use the plywood panel for mounting components on all walls other than masonry. Arrange the components as shown on the equipment layout detail in the plans.

Install conductors and conduit in accordance with Articles 1400-4F of the Standard Specifications titled "Wiring Methods" and 1400-4E "Conduit Installation". Clearly identify the phase, neutral, and contact conductors for the photocontrol in the wire trough.

Install flashing around the conduit extended through the roof to the photo control.

Securely fasten each component to the wall or panel with corrosion resistant bolts and inserts. Utilize all mounting holes in each component. Install a galvanized washer between the component and masonry walls to assure a minimum of ¼" air space.

Paint the plywood panel the same color as the wall. After the control system components are installed, clean, prime, and paint all exposed surfaces of enclosures and conduit with a premium quality paint that best matches the color of the adjacent walls. Mask all legend plates, nameplates, etc. while painting.

4.40 MEASUREMENT AND PAYMENT

The quantity of light control systems to be paid for will be the actual number of light control systems that have been installed and accepted.

The quantity of light control systems, measured as provided above, will be paid for at the contract unit price each for "Light Control Equipment _____ " of the appropriate type. Such price and payment will be full compensation for all work of furnishing and installing an entire control system, including mounting panel, control circuit, photocontrol, contactors, breakers, and selector switch.

Payment will be made under:

Light Control Equipment Type RA 120/208V ..... Each

5.00 BOLLARD LIGHT STANDARD

5.10 DESCRIPTION

The work covered by this section consists of furnishing and installing bollard light standards with luminaires. These lights are used as landscape accent lights around the building entrances.

5.20 MATERIALS

Housing and Top Cap

Provide natural precast concrete bollards with a light sandblast finish. Bollard shall be 42" high by 12" wide with a rounded cap. Base plate should be 18" in diameter.

Optical Train

Bollard should have a durable, corrosion resistant cast aluminum louver system providing 30° cutoff. An internal clear acrylic lens shall surround the lamp.

Lamp and Holder

The lamp holder shall be medium base porcelain and shall be equipped with a 100W Metal Halide (MH) lamp.

Ballast

Ballast should be a high power factor, constant wattage autotransformer rated for 208VAC, three-phase power and capable of starting down to -20°F. Electrical components shall be mounted to a removable ballast tray. Ballast shall be equipped with factory installed quick disconnect plug.

5.30 CONSTRUCTION METHODS

Install bollard lights as shown on the plans. Use scaled dimensions to locate lights. Adjust final location as per direction of the engineer to avoid conflicts with other objects. Protect the light during storage and installation to ensure against scratches or dents, and to prevent damage by other construction work.

Install conductors and conduit in accordance with Articles 1400-4F of the Standard Specifications titled "Wiring Methods" and 1400-4E "Conduit Installation", and manufacturer's recommendations.

5.40 MEASUREMENT AND PAYMENT

The quantity of bollard light standards to be paid for will be the actual number of bollards that have been installed and accepted.

The quantity of bollards, measured as provided above, will be paid for at the contract unit price each for "Bollard Light Standard" of the appropriate type. Such price and payment will be full compensation for all work of furnishing and installing the standard.

Payment will be made under:

Bollard Light Standard ..... Each

6.00 STANDARD FOUNDATION TYPE B1

6.10 DESCRIPTION

Work covered by this section shall be in conformance with Section 1405 of the Standard Specifications except as modified below.

6.20 MATERIALS

Same as Standard Specifications Section 1405-2

6.30 CONSTRUCTION METHODS

Light standard foundation type B1 for bollard light standards shall be constructed as shown on the Lighting Details plansheet.

The type B1 foundation shall be 24" diameter by 36" deep.

Anchor bolts supplied by the bollard light manufacturer shall be cast into the concrete base and positioned per the manufacturer's template.

6.40 MEASUREMENT AND PAYMENT

Same as Standard Specifications Section 1405-4

7.00 STANDARD FOUNDATION TYPE R1S

7.10 DESCRIPTION

Work covered by this section shall be in conformance with Section 1405 of the Standard Specifications except as modified below.

7.20 MATERIALS

Same as Standard Specifications Section 1405-2

7.30 CONSTRUCTION METHODS

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Light standard foundation type R1S for post top lights shall be equal to type R1 on standard drawing 1405.01 except as stated below.

The type R1S foundation shall be 24" diameter by 48" deep.

Anchor bolts supplied by the post top light manufacturer shall be cast into the concrete base and positioned per the manufacturer's template.

7.40 MEASUREMENT AND PAYMENT

Same as Standard Specifications Section 1405-4

8.00 FEEDER CIRCUITS

8.10 DESCRIPTION

This work is to provide power service from the southbound rest area main building to the storage building near the truck parking. Grounding electrode shall be installed at the storage building in accordance with NEC article 250.32. Work covered by this section shall be in conformance with Section 1410 of the Standard Specifications except as modified below.

8.20 MATERIALS

Same as Standard Specifications Section 1410-2

8.30 CONSTRUCTION METHODS

Furnish and install two phase conductors, AWG #2, (Black and Red) and one neutral conductor, AWG #2, (White). These feeder circuit conductors will be installed either in a 2" PVC conduit or inside other electrical duct as shown on the plans.

8.40 MEASUREMENT AND PAYMENT

Same as Standard Specifications Section 1410-4

The quantity of feeder circuits, measured as provided above, will be paid for at the contract unit price per linear foot for "2 #2 with Neutral Feeder Circuit" or "2 #2 with Neutral Feeder Circuit in 2" Conduit" of the appropriate size and type.

Payment will be made under the following pay items:

2 #2 with Neutral Feeder Circuit	Linear Foot
2 #2 with Neutral Feeder Circuit in 2" Conduit	Linear Foot