

**S T A T E****O F****T E N N E S S E E**

(Rev. 12-15-21)

(Rev. 12-19-22)

(Rev. 12-26-24)

January 1, 2021

**Supplemental Specifications – 700SS****of the****Standard Specifications for Road and Bridge Construction****January 1, 2021****Subsection 702.02, (pg. 688), 12-19-22; Materials, Revise 4<sup>th</sup> Paragraph:**

The Department will make compressive strength test specimens in accordance with AASHTO R 100.

**Subsection 705.06, (pg. 697-698), 12-19-22; Installation of Posts; Revise 1<sup>st</sup>, 2<sup>nd</sup>, Nos. 1,2,3, & 4 and 4<sup>th</sup> Paragraphs:**

Before beginning any excavation or driving any guardrail post, determine the location of all underground electrical, drainage, and utility lines in the vicinity, and conduct work to avoid damaging these facilities. Dig or drill holes to the depth shown on the Plans and/or the approved Shop Drawings and to a size that will allow proper setting of the posts and sufficient room for backfilling and tamping. Drive posts using approved methods and equipment, provided the posts are erected in the proper position and are free of distortion, burring, or other damage.

If solid rock is encountered while installing guardrail posts to the minimum depth required. The installation of guardrail posts shall meet requirements that are detailed in the Departments Standard Drawings or approved Shop Drawings for drilling post holes.

If solid rock is encountered when installing end terminals using tubes, install posts 1 and 2 to full depth or a minimum of 36 inches into the solid rock. Backfill the holes around the steel tube with the cutting spoils.

See approved shop drawings for additional information concerning post depth and hole size.

Backfill dug holes with selected earth or other suitable materials in layers not to exceed 4 inches in thickness. Thoroughly tamp each layer. After backfilling and tamping is complete, hold the posts or anchors securely in place.

**Subsection 705.06, (pg. 698), 12-15-21; Installation of Posts; Add new 7<sup>th</sup> Paragraph:**

When an underground structure or utility prevents proper post installation for a run of guardrail, posts may be omitted along the run of guardrail only as detailed in the Department's Standard Drawings. A post will not be omitted from any end terminal or transition. If the conditions noted for omitting posts cannot be used, then the use of a guardrail footing or weak post attachment to culvert may be used as detailed in the Department's Standard Drawings

**Subsection 705.10, (pg. 700), 12-15-21; Basis of Payment; Add new 7<sup>th</sup> Paragraph:**

When posts are omitted from a run of guardrail, payment shall be as noted in the Standard Drawings.

- a. For 1 post being omitted, the Department will pay the contract unit price for W Beam Guardrail (Type 2) MASH TL-3.
- b. For 2 or 3 posts being omitted, the Department will pay for the linear feet of nested W Beam rail as detailed in the Standard Drawings at a rate equal of 1.5 times the contract unit price for W Beam Guardrail (Type 2) MASH TL-3.
- c. If a guardrail footing or attachment to culvert was used, the Department will pay for work as noted in the Standard Drawings.

**Subsection 710.06, (pg. 723), 12-19-22; Aggregate Underdrains (with Pipe); Revise 1<sup>st</sup> Paragraph:**

Excavate the trench to receive the pipe at the locations shown on the Plans or as directed by the Engineer. If the Plans do not show dimensions, construct the width of the trench to be not less than 12 inches. Make the trench deep enough to intercept the water-bearing strata and to allow installation of the pipe and cover material. Unless otherwise shown on the Plans, spread a 2-inch layer of aggregate on the bottom of the trench, compact it, and bring to a uniform grade.

**Subsection 712.02, (pg. 731-732), 12-15-21; Materials; Revise List:**

Aluminum.....	916.02
Paint.....	910.02
Cold Rolled Carbon Steel -16 gauge .....	ASTM A1008
Non-metallic Drums and Barricades .....	QPL
Reflective Sheeting.....	916.06

**Subsection 712.02.B, (pg. 732), 12-15-21; Temporary Pavement Marking Material; Revise 1<sup>st</sup> Paragraph:**

Unless otherwise specified, the material for pavement marking shall be either temporary pavement marking tape listed on the Department's QPL, or reflectorized paint with raised reflective pavement markers placed as shown on the Plans

**Subsection 712.02.E, (pg. 733), 12-15-21; Portable Impact Attenuators; Revise Heading & 1<sup>st</sup> Paragraph:****E. Temporary Work Zone Crash Cushions**

Temporary work zone crash cushions shall be in accordance with the Plans and Specifications, meet the requirements for the appropriate test level, and meet the requirements of and be listed on the Department's QPL or Standard Drawings.

**Subsection 712.04 & D, (pg. 734 & 737), 12-26-24; General, Signs; Revise 4<sup>th</sup> Paragraph, & D; 5<sup>th</sup> Paragraph:**

During periods of non-use, remove warning signs and other devices from the work area, and cover or otherwise position them so they do not convey their message to the traveling public and do not present a safety hazard to drivers. If covered, maintain the covering material in a neat and workmanlike manner during its use. The method of covering the sign face shall not deface or damage the retroreflective sheeting of the sign. Plastic bags shall not be allowed to cover signs.

**D. Signs**

Cover all existing signs or portions of a sign(s) that are not applicable to the Traffic Control Plan so as not to be visible to traffic, or remove such sign(s) from the roadway when not in use. Signs shall be covered with an opaque, form fitting, tear resistant material that fully obscures the sign text and shall not deface or damage the retroreflective sheeting of the sign. Plastic bags shall not be allowed to cover signs.

**Subsection 712.04.B, (pg. 735-736), 12-15-21; THP Troopers and Uniformed Law Enforcement Officers; Revise 2<sup>nd</sup> Paragraph:**

When a THP Trooper is not available, the Contractor may provide a Uniformed Law Enforcement Officer if approved by the Engineer and the Regional Safety Coordinator or Regional Operations Office. All Uniformed Law Enforcement Officers shall provide a marked Federal, State, County, City, or Metropolitan government law enforcement vehicle equipped with blue lights and have the authority to write traffic tickets and make arrests within the project site. The Uniformed Law Enforcement Officer shall maintain a detailed written log of enforcement activities and shall submit the log to the Engineer for verification each month.

**Subsection 712.06, (pg. 743), 12-15-21; Temporary Marking; Revise Heading, Add No. 2, & Revise No. 1 & 3:**

**712.06 Temporary Pavement Marking**

Unless otherwise specified, install temporary pavement marking as follows:

1. Provide 4-inch wide pavement marking (line) for center, edge, lane and barrier lines as shown on the Plans for projects that will have traffic maintained overnight. For temporary pavement markings (line) on intermediate layers of pavement, use reflective tape, reflectorized paint, and raised pavement markers, or a combination thereof as shown on the Plans or as required by the Engineer, and install meeting **716, 910.02, 919.04**, or Department's QPL at the end of each day's work. Short, unmarked sections will not be allowed. Preserve established no-passing zones, if any, on the existing pavement; if no-passing zones have not previously been established, establish them before beginning the work. Mark two-lane, two-way highways with 10-foot long center lines applied on 40-foot centers and appropriate no-passing barrier lines.
2. When required, provide temporary pavement markings at intersections for temporary pavement markings on intermediate layers of pavement. The Department will require temporary intersection pavement markings to be reflectorized paint, or removable pavement marking meeting **716, 910.02, 919.04**, and or Department's QPL.
3. Where required on the completed permanent pavement surface, meet **716.03**.

**Subsection 712.09, (pg. 744, 745), 12-15-21; Method of Measurement; Revise No. 5, 7, 8 & Add 9:**

5. Warning Lights and Flashing Arrow Boards by the unit, Changeable Message Signs per each for the type designated. Payment will be based on the maximum number in place at one time.
7. Temporary Work Zone Crash Cushion based on the initial installation of each. No additional payment will be made for removal, moving, and reinstalling at other locations on the Project as directed by the Engineer. Payment will be based on the maximum number in place at one time.
8. Temporary pavement marking (line) for edge, center, lane and barrier lines will be measured as listed in the plans, complete in place and accepted, as Painted Pavement Marking (Line) regardless of whether the lines are painted, taped markings, or raised pavement markers, or a combination of the above as shown on the Plans or as required by the Engineer. Only the marked line will be measured for payment.
9. Temporary pavement markings at intersections will be measured as listed in the plans complete in place and accepted as Painted Pavement Marking (Description) or Removable Pavement Marking (Description)

**Subsection 712.10**, (pg. 746, 747), 12-15-21; **Basis of Payment; Revise Item List & Paragraphs 4, 5, 9, Remove Paragraph 8:**

<i>Item</i>	<i>Pay Unit</i>
Traffic Control	Lump Sum
Portable Barrier Rail	Linear Feet
Temporary Work Zone Crash Cushion	Each
Signs	Square Feet
Flexible Drums	Each
Temporary Barricades (Type)	Linear Feet
Removable Pavement Marking (Description)	Linear Feet
Changeable Message Sign Unit	Each
Arrow Board (Type C)	Each
Barrier Rail Delineator	Each
Temporary Flexible Tubular Delineator	Each

Payment for Temporary Work Zone Crash Cushion will be made at the contract price, complete in place, with total payment based on the maximum number in place at one time as specified in **712.09**.

Payment for Signs (Construction) is full compensation for providing sign panels with proper sheeting and legend, erecting on proper supports, furnishing all mounting hardware, covering when not in use, relocating, handling, and maintaining until Project completion. Vertical Panels will be paid as Signs (Construction).

Payment for Removable Pavement Marking items shall be full compensation for the installation, maintenance, and removal of the marking line when it is no longer required.

**Subsection 714.02**, (pg. 757-758); **12-26-24, Materials**; Revise subsection:

Provide materials as specified in **917** and as follows:

Portland Cement Concrete, Class A.....	<b>604</b>
Crushed Stone Grading D.....	<b>903.05</b>
Steel Bar Reinforcement for Concrete Structures.....	<b>907.01</b>
Welded Steel Wire Fabric.....	<b>907.03</b>
Gray Iron Castings.....	<b>908.07</b>
Inorganic Zinc Paint.....	<b>910.03</b>
Cement Concrete Curing Materials.....	<b>913</b>
Conduit.....	<b>917.05 or 917.07</b>

Within 30 days after the issuance of the work order, submit to the Engineer ~~four collated~~ one digital sets of the manufacturer's descriptive literature and technical data, fully describing the types of lighting equipment proposed for use. In the descriptive literature, identify the manufacturer and model, and include sufficient information for the Engineer to determine if the equipment or material meets the requirements of the Plans and these Specifications. Include with ~~these sets~~ of submittal data a list of the materials submitted along with descriptive material for, but not limited to, the following items when applicable.

1. Complete photometric data of luminaires as published by the manufacturer with independent testing laboratory results.

~~2. Computer printouts showing illumination levels throughout each interchange area where high mast luminaires are to be installed.~~

23. General details of light standards, breakaway bases, and bracket arms. For light standards ~~taller than~~with a mounting height from 30 feet to 50 feet, submit one set of design calculations and ~~six~~one digital prints of “Design” or “Shop” drawings to the Traffic Design Division ~~of Structures~~ for approval purposes. The Department will review these drawings at the earliest possible date and will return ~~two~~ digital prints marked “Approved for Fabrication,” or “Returned for Revisions as Noted.” Respond by taking appropriate action to ensure the earliest possible correction of these items so as not to delay the installation.

34. Highmast tower details with a set of design calculations for each height including access hole, base, anchorage, head frame, and lowering device. Include specification references for materials and location, type, size, and extent of welds. In addition to the set of design calculations, submit ~~six~~one digital prints of “Design” or “Shop” drawings for each highmast tower height to the Traffic Design Division ~~of Structures~~ for approval purposes, in a manner similar to that specified in Item 23 above for light standards ~~taller than~~with a mounting height from 30 feet to 50 feet.

45. Dimension sheets and performance data on all related equipment.

The Engineer will retain one copy and forward one copy each to the local entity (city or county engineer) and the Traffic Design Operations Division for their review.

Also include with the submittal sets ~~six~~ detailed scale drawings of all non-standard or special equipment and of all proposed deviations from the Plans. Deviations from the Plans or Specifications require approval from the Traffic Design Operations Division. Include a letter requesting deviations or alternate materials in the submittal for Traffic Design Operations Division approval. Upon request, submit for approval sample articles of materials proposed for use. The Department will not be liable for any materials purchased, labor performed, or delay to the Work prior to such approval.

In addition to the above, include with each submittal a notarized letter certifying that all lighting system materials listed in the submittal conform to the Plans and Specifications. Also submit to the Engineer a statement from the Maintaining Agency that all lighting system materials listed in the submittal are acceptable to the Agency.

**Subsection 714.03**, (pg. 758); **12-26-24, Codes**; Revise subsection:

Furnish material and perform all work in strict accordance with the latest revision of the National Electrical Code (NEC), the National Electrical Safety Code (NESC), the Illuminating Engineering Society (IES) publications, ANSI standards, and the codes, regulations, and rules prevailing in the area in which the Work is being performed, as applicable.

**Subsection 714.05.A.1**, (pg. 759-761); **12-26-24, Underground Conduit, General**; Revise 1<sup>st</sup>, 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> Paragraphs, Add new **1.c**:

Underground conduit shall ~~consist of~~be placed as: encased, ~~or~~ direct burial conduit, or by direction boring method. Install conduit in a trench excavated to the dimensions and lines specified.

Obstructions encountered when excavating trenches for underground conduit may require minor changes, such as in locations of conduit runs and pull boxes. Obtain the Engineer's approval before making such changes. Where possible, contact the utility companies to have clear distance required by the specific utility company's standards and specifications to keep electric conduits and pullboxes away from provide a minimum of 12 inches between the finished lines of conduit runs and utility facilities, such as gas lines, water mains, and other underground facilities not associated with the electrical system. Where the conduit run is adjacent to concrete walls, piers, footings, and similar structures, maintain a minimum of 4 inches of undisturbed earth or firmly compacted soil between the conduit and the adjacent concrete or, when the conduit is encased, between the encasement and the adjacent concrete.

Unless shown on the Plans, do not excavate trenches in existing pavement or surfaced shoulders to install conduit. If it is necessary to place a conduit under an existing pavement, install the conduit by jackingdirectional boring -or other approved means with galvanized rigid steel conduit or schedule 80 PVC conduit.

Keep ~~jacking and~~ drilling pits at least 10 feet from the edge of the paved shoulder or sidewalk unless otherwise directed by the Engineer. When the Plans specifically allow excavation of a trench through an existing pavement or surfaced shoulder, restore the pavement and/or surface and base to their original condition. Do not leave boring pits open for extended periods of time.

c. Directional Boring Conduit. To be used under existing: roads, sidewalks, and business drive.

**Subsection 714.05.B**, (pg. 762); **12-26-24, Conduit On Structures**; Revise 1<sup>st</sup>, & Add New Last Paragraph:

Existing bridges install conduits, conduit fittings, hangers, expansion fittings, and accessories as shown on the Plans and, unless otherwise specified, in accordance with the following:...

Proposed bridges provide structural lighting item materials for the bridge designer to include in the proposed bridge superstructure and substructure when lighting is required.

**Subsection 714.08.A.3**, (pg. 766); **12-26-24, Wood Poles**; Revise Paragraph:

**3. Wood Poles (For Utility Use Only).** Excavate for wood poles as specified for prestressed concrete butt base pole foundations in **714.08.A.2**. Dig or drill the holes to the depth shown on the Plans and in such diameter to allow satisfactory use of mechanical tamping equipment.

**Subsection 714.10, A & B,** (pg. 767-769); **12-26-24, Luminaires, A. High Intensity Discharge (HID), B. Light Emitting Diode (LED);** Revise 1<sup>st</sup> Paragraph, Remove A., B; Revise 1<sup>st</sup> Paragraph & No. 3:

~~The Department only Uses Light Emitting Diode (LED) the following luminaires types on the for roads and bridges: High Intensity Discharge (HID) which includes High Pressure Sodium (HPS) and Metal Halide (MH); Fluorescent and Induction lamps; and Light Emitting Diode (LED).~~

~~A. High Intensity Discharge (HID)~~

~~High Intensity Discharge (HID) luminaires shall meet IES standards from LM 51-00 to LM 35-02. The HID luminaire shall be covered by a one year written warranty starting from the system acceptance date. All the other electrical and mechanical component parts of the HID shall be covered by a five year written warranty starting from the system acceptance date. The signed warranty certificate shall be submitted prior to final payment.~~

**B. Light Emitting Diode (LED)**

Light Emitting Diode (LED) luminaires shall be manufactured in accordance with ANSI C136.37-2011 (or recent version). All testing and data sheets for proposed LEDs shall be included in the submittal package and shall include, but not limited to, the following: Illuminating Engineering Society of North America (IESNA): LM-79-08, LM-80-08, RP-8-14, TM-3-95, and TM-15-07 (all should be up-to-date versions). In addition to these requirements, the LEDs shall meet the following requirements:

3. **Optical Assembly.** The LED optical assembly package shall have a minimum Ingress Protection rating of IP 66 according to ANSI/IEC 60529. The luminaire shall have a standardized refractor/reflector to meet the required optical distribution as required by the plans. The optical assembly shall utilize high brightness, long life, minimum 70 color rendering index (CRI), (3000 K-5700 K) color temperature ~~(+/- 300 K)~~ LEDs binned according to ANSI C78.377. Lenses shall be UV-stabilized acrylic or glass. Provisions for house-side shielding shall be provided when specified.

**Subsection 714.14,** (pg. 770-771); **12-26-24, Control Center;** Revise subsection:

Furnish and install a service pole or poles of the design, type, size, and class, and at the locations shown on the Plans, for the electric connection use. Install the service pole(s) as specified in **714.08** and as shown on the Plans. Set the service pole(s) plumb.

Notify the power company, at least 30 days before connection, of the need to furnish power to operate the lighting system.

Unless otherwise specified, furnish and install all the control center equipment and electrical supply facilities. The electrical supply facilities shall include the necessary service conduit from the control cabinet to the ~~delivery point~~ proposed light poles designated on the Plans.

Construct a concrete slab for all proposed light control centers, unless the utility company wants to place the proposed light control center on a pole, of the dimensions and thickness indicated, around the



service pole foundation. Construct the slab of Class A concrete meeting the requirements of **604**, and reinforce the slab, if specified, as shown on the Plans.

Construct a 6-foot chain-link fence and gate, if the utility company requests, of the size specified around the control center as shown on the Plans and as specified in **707**.

**Subsection 714.20.F**, (pg. 774); **12-26-24, Luminaires**; Revise Paragraph:

The Department will measure Luminaires of the size, type, and design specified by the unit, per each, ~~regardless of their classifications (i.e. LED, HID).~~

**Subsection 714.21.E, & F**, (pg. 777-778); **12-26-24, Light Standards & Luminaires**; Revise Paragraphs:

#### **E. Light Standards**

The Department will pay for Light Standards of the type specified at the contract unit price per each, complete in place. Such payment is full compensation for furnishing and installing the complete light standards, including the ~~foundation~~, standard, bracket arm or arms, associated hardware and wiring, grounding materials, excavation, backfilling materials, and backfilling. The Department will measure foundations for typical light standard (30 feet to 50 feet) and high mast towers separately.

#### **F. Luminaires**

The Department will pay for Luminaires of the size and type specified at the contract unit price per each, ~~regardless of their classifications (i.e. LED, HID)~~, complete in place. Such payment is full compensation for furnishing and installing the complete luminaire, including the ballast(s) or driver(s), lamp(s), glare shields where required, and associated hardware and wiring.

**Subsection 716.03.B**, (pg. 790), 12-15-21; **Application; Revise No. 3 & Add No. 4:**

3. **Temporary Pavement Marking (Line).** When thermoplastic is used on the final pavement surface, the Contractor may use reflectorized paint for the center, edge, lane and barrier lines installed meeting **716.07** and **910** at the end of each day's work and then install the permanent pavement marking after the paving operation is completed. Short, unmarked sections are not allowed. The Department will not directly measure and pay for temporary markings for the final surface and will consider the costs thereof to be incidental to the item for the permanent thermoplastic pavement markings (line).
4. **Temporary Pavement Markings at Intersections.** When required, temporary pavement markings at intersections are to be installed with reflectorized paint meeting **716.07** and **910**. The Department will measure and pay as noted in **712.09** and **712.10**,

**Subsection 716.07.A**, (pg. 793), 12-15-21; **Application; Revise 11<sup>th</sup> Paragraph:**

When reflectorized paint is required for temporary or final marking, install the paint meeting **910.02** at the end of each day's work. Do not leave any short, unmarked sections.

**Subsection 717.03**, (pg. 799-800), 12-19-22; **Basis of Payment; Revise Subsection:**

The Department will pay for Mobilization on a lump sum basis.

The Department will make partial payments for Mobilization based on the amount bid for mobilization and the total original contract amount for all items of work. If the amount bid for the item of Mobilization exceeds 10% of the total amount bid for the Contract, the Department will pay that portion exceeding 10% on the last partial pay estimate. Payments will be made according to Table 717.03-1.

**Table 717.03-1: Payment Schedule for Mobilization**

<b>Payment Estimate Number or Completion of Contract</b>	<b>Payment Amount whichever is least</b>	<b>Accumulated Payment whichever is least</b>
Estimate # 1	25% Lump Sum Item or 2.5% Contract Price	25% Lump Sum Item or 2.5% Contract Price
5% of Contract (Excluding previous mobilization payments and stockpile payments per 109.09)	25% Lump Sum Item or 2.5% Contract Price	50% Lump Sum Item or 5.0% Contract Price
10% of Contract (Excluding previous mobilization payments and stockpile payments per 109.09)	25% Lump Sum Item or 2.5% Contract Price	75% Lump Sum Item or 7.5% Contract Price
50% of Contract (Including previous mobilization payments and stockpile payments per 109.09)	25% Lump Sum Item or 2.5% Contract Price	100% Lump Sum Item or 10.0% Contract Price
Last Partial Pay Estimate	Portion Exceeding 10%	Portion Exceeding 10%

If 50% or more of the total original contract amount is completed by the payment of Estimate #1, a payment of 75% of the price bid for Mobilization will be made on Estimate #1. The remainder of the price bid for Mobilization will be paid on the following estimate.

**Subsection 722.06.E**, (pg. 803), 12-19-22; **Interior Utility Services; Revise Subsection E:**

**E. Telephone and Internet**

Provide telephone service with voicemail and two incoming phone lines. Provide internet service with wifi and two data ports for wired connections.

**Subsection 722.09**, (pg. 805), 12-19-22; **Concrete Cylinder Storage; Revise 1<sup>st</sup> Paragraph:**

Provide a storage facility (shed/building) for temporary storage of concrete acceptance cylinders. The storage facility shall be of sufficient size and construction to protect the concrete cylinders from the elements and damage. Obtain the Engineer's approval of the storage facility location. Department personnel shall have access to the storage facility. Equip the storage facility with a concrete curing environment consisting of a box or water curing tank with a heating/circulating system of sufficient size to properly cure all acceptance cylinders before transferring for final storage and testing. Provide a temperature measuring device capable of recording the conditions inside the curing environment. The curing environment shall comply with AASHTO M 201, and proper curing of the cylinders shall be in accordance with AASHTO R 100. Temperature data for the curing environment shall be kept for the duration of the projects and made available to the Department upon request. The Department will not accept any concrete without the Engineers approval of the storage facility.