



# 2024 Standard Specification Training Seminar



# 600 Items

2024 Spec Book update

February 16, 2024



## Item 610 – Roadway Illumination Assemblies

- Removed field sampling and testing of luminaires according to Tex-1110-T
- Relocation – added instruction to clean optical assembly when reusing
- Replace Luminaires – added replacement of conductors and breakaway fuseholders when necessary.





## Item 613 – High Mast Illumination Poles

- Fabrication - Added ultrasonic testing of seam welds
- Added specification for mechanically-guided thermal-cut holes
- Added ultrasonic testing of base plate weld for toe cracks after galvanizing
- Updated Fabrication Tolerances table





## Item 614 – High Mast Illumination Assemblies

- Description – added new item for Replace Luminaires
- Installation – added support assembly to fabrication instructions
- Replace Luminaires – added instructions to Construction, Measurement, and Payment for replacement of high mast luminaires.





## Item 616 – Performance Testing of Lighting Systems

- Removed acceptance of the Contract as a requirement to relieve Contractor of maintenance responsibilities. Contractor only has to pass 14 day performance test before turning maintenance over to Department.





## Item 617 – Temporary Roadway Illumination

- Changed Description, Measurement, and Payment to two items: Setup and Removal, and Maintain Roadway Illumination.
- Setup and Removal is measured by each Roadway Illumination Assembly installed and removed. A relocation is considered an instance of Setup and Removal.
- Maintain Roadway Illumination is measured by the Month and covers maintenance of the complete illumination system.
- Electrical service responsibilities were changed to match that for Item 681 Temporary Traffic Signals.





## Item 618 – Conduit

- Added Prepare Existing Conduit spec from SS6027 to Item 618
- Minor clarifications of wording to other sections





## Item 619 – Intelligent Transportation System (ITS) Multi-Duct Conduit

- Special Spec 6016 was converted into the new Standard Spec item 619
- Differentiates between conduit for communication or electrical with ITS multi-duct conduit

**Special Specification 6016**



**Intelligent Transportation System (ITS) Multi-Duct Conduit**

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**1. DESCRIPTION**

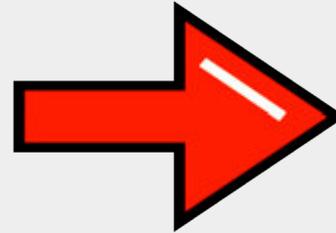
Furnish and install Intelligent Transportation System (ITS) multi-duct conduit identified for fiber optic communication use of the type and size specified. Provide conduit suitable for installation in an outdoor underground environment including constant immersion in water, mounted to retaining walls, and mounted above ground on the underside of a bridge without any degradation to the conduit.

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**2. MATERIALS**

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the requirements of the following Items:

- Item 400, "Excavation and Backfill for Structures,"
- Item 401, "Flowable Fill,"
- Item 402, "Trench Excavation Protection,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 445, "Galvanizing,"
- Item 476, "Jacking, Boring, or Tunneling Pipe or Box,"
- Item 618, "Conduit," and
- Item 620, "Electrical Conductors".



**Item 619**



**Intelligent Transportation System (ITS) Multi-Duct Conduit**

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**1. DESCRIPTION**

Furnish and install intelligent transportation system (ITS) multi-duct conduit identified for fiber optic communication use of the type and size specified. Provide conduit suitable for installation in an outdoor underground environment, including constant immersion in water, mounted to retaining walls, and mounted above ground on the underside of a bridge without any degradation to the conduit.

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**2. MATERIALS**

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the requirements of the following Items.

- Item 400, "Excavation and Backfill for Structures"
- Item 401, "Flowable Backfill"
- Item 402, "Trench Excavation Protection"
- Item 421, "Hydraulic Cement Concrete"
- Item 445, "Galvanizing"
- Item 476, "Jacking, Boring, or Tunneling Pipe or Box"
- Item 618, "Conduit"
- Item 620, "Electrical Conductors"



## Item 619 – Intelligent Transportation System (ITS) Multi-Duct Conduit (Cont'd)

- Materials and Equipment sections were moved from SS 6016 to a new DMS-110XX, referenced by Item 619. This will allow new materials to be specified in the DMS rather than in the standard spec Item.
- Item 619 has 2 additional paragraphs at end of 1st section of CONSTRUCTION 3.1

Ensure a watertight seal of conduit to structure wall when terminating conduit.

Install markers using a method that firmly and securely anchors the marker a minimum of 1 ft. into the ground to prohibit twisting and easy removal. When located at an ITS ground box, marker may be placed within the concrete riprap apron avoiding rebar reinforcement. Spacing between markers should not exceed 1,000 ft. or as shown on the plans, and markers should be placed at significant changes in direction, such as a 90° turn. Do not place markers in any roadway paved surface.



## Item 620 – Electrical Conductors

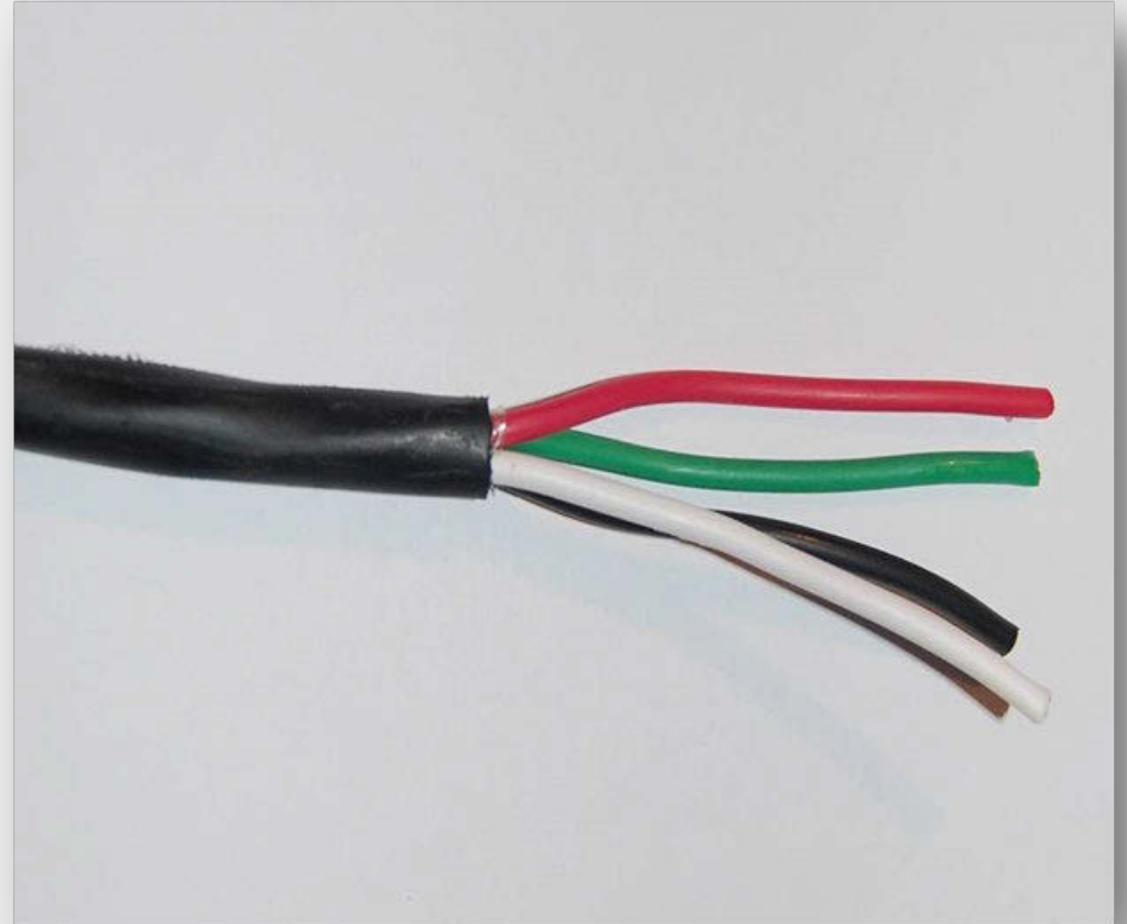
- Minor clarifications of wording





## Item 621 – Tray Cable

- Minor clarifications of wording





## Item 622 – Duct Cable

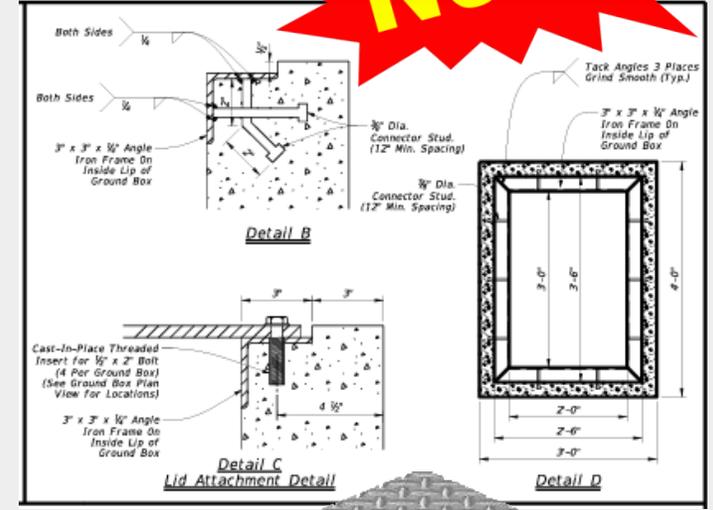
- Removed Item 622 Duct Cable as standard item due to low usage on projects.
- Converted to Statewide Special Specification



# Item 600 Series – 2024 Specification Book Rewrite

## Item 623 – ITS Ground Box

- Special Spec 6186 converted to Standard Spec 623



Type 1 TxDOT Ground Box - 12"x24"x24" - Concrete

### Special Specification 6186

#### Intelligent Transportation System (ITS) Ground Box



#### 1. DESCRIPTION

Construct, furnish, install or remove Intelligent Transportation System (ITS) ground boxes for fiber optic communication infrastructure complete with lids.

#### 2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the requirements of the following items:

- Item 420, "Concrete Substructures,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 432, "Riprap,"
- Item 440, "Reinforcement for Concrete,"
- Item 471, "Frames, Grates, Rings, and Covers,"
- Item 618, "Conduit", and
- Item 620, "Electrical Conductors."

Provide new ITS ground boxes constructed of precast concrete or polymer concrete in accordance with the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards, most current version. Faulty fabrication or poor workmanship in materials, equipment, or installation will be justification for rejection. Provide manufacturer's warranties or guarantees when offered as a customary trade practice.

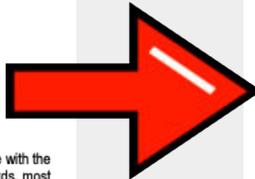
2.1. **Precast Concrete.** Provide precast concrete ground boxes and aprons that comply with the details shown on the plans, the requirements of this Item, and in accordance with the following:

- construct ground boxes with Class A concrete in accordance with Item 421, "Hydraulic Cement Concrete," unless otherwise directed,
- provide American Society for Testing and Materials (ASTM) A 615 Grade 60 reinforcement steel in accordance with Item 440, "Reinforcing Steel," and
- provide steel for the frames and covers in accordance with Item 471, "Frames, Grates, Rings, and Covers," unless otherwise approved by the Engineer.

2.1.1. **Loading Requirements.** Designed to withstand American Association of State Highway and Transportation Officials (AASHTO) H-20 loading. Manufacturer must furnish certification of conformance with H-20 loading.

2.2. **Polymer Concrete.** Manufacture ground box and ground box cover from polymer concrete reinforced with 2 continuous layers of fiberglass fabric. Provide fabricated precast polymer concrete ground boxes and aprons that comply with the details shown on the plans, the requirements of this Item, and in accordance with American Standards Institute (ANSI)/Society of Cable Telecommunications Engineers (SCTE) - ANSI/SCTE 77, most current version.

- **Polymer Concrete.** Construct polymer concrete from catalyzed polyester resin, sand, and aggregate. Polymer concrete containing chopped fiberglass or fiberglass-reinforced plastic is prohibited. Ensure a minimum compressive strength of 11,000 psi.



### Item 623

#### Intelligent Transportation System (ITS) Ground Boxes



#### 1. DESCRIPTION

Construct, furnish, install, or remove Intelligent Transportation System (ITS) ground boxes for fiber optic communication infrastructure complete with lids.

#### 2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the requirements of the following items.

- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 432, "Riprap"
- Item 440, "Reinforcement for Concrete"
- Item 471, "Frames, Grates, Rings, and Covers"
- Item 618, "Conduit"
- Item 620, "Electrical Conductors"

2.1. **Precast Concrete.** Provide precast concrete ground boxes and aprons as shown on the plans and in accordance with the following.

- Construct ground boxes with Class A concrete in accordance with Item 421, unless otherwise directed.
- Provide ASTM A615 Grade 60 reinforcement steel in accordance with Item 440.
- Provide steel for the frames and covers in accordance with Item 471, unless otherwise approved.

2.1.1. **Loading Requirements.** Designed to withstand AASHTO H-20 loading. Manufacturer must furnish certification of conformance with H-20 loading.

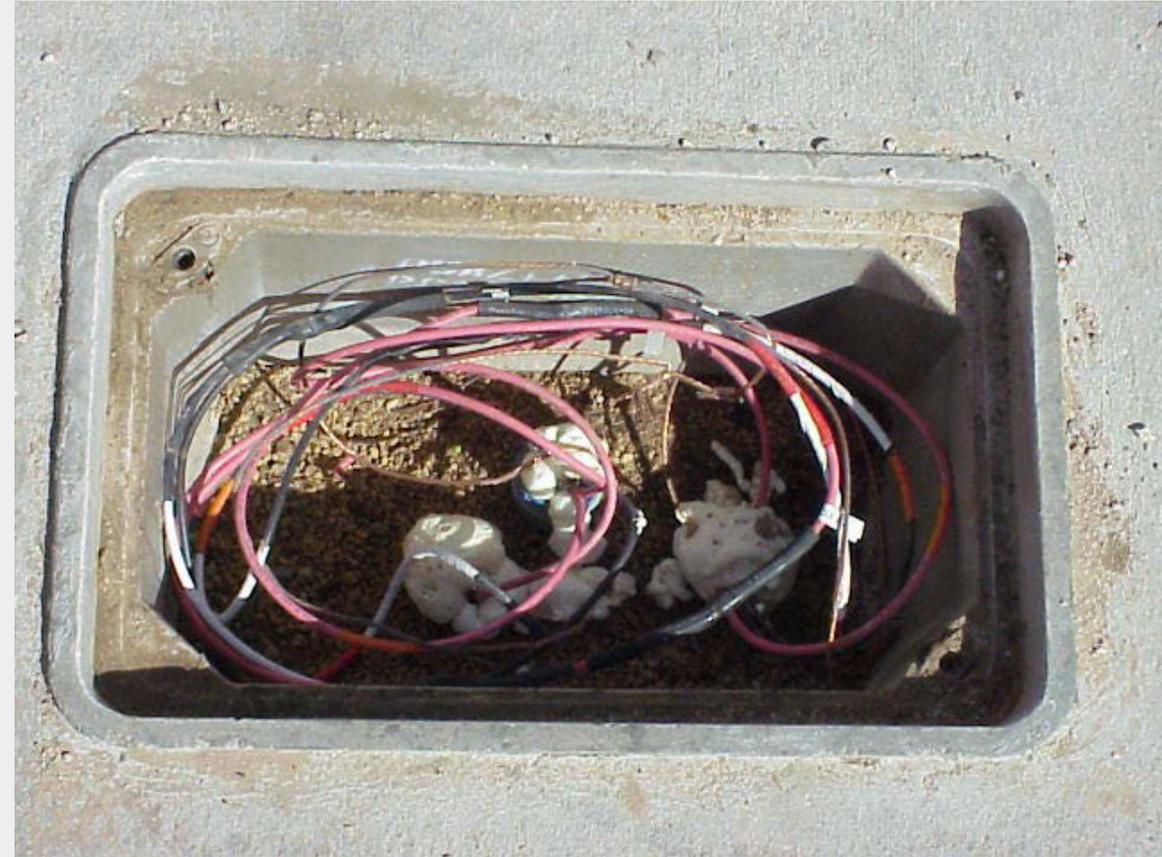
2.2. **Polymer Concrete.** Manufacture ground box and ground box cover from polymer concrete reinforced with two continuous layers of fiberglass fabric. Provide fabricated precast polymer concrete ground boxes and aprons as shown on the plans and in accordance with ANSI/Society of Cable Telecommunications Engineers (SCTE) 77.

- **Polymer Concrete.** Construct polymer concrete from catalyzed polyester resin, sand, and aggregate. Polymer concrete containing chopped fiberglass or fiberglass-reinforced plastic is prohibited. Ensure a minimum compressive strength of 11,000 psi.
- **Fiberglass Fabric.** The base glass on the fiberglass fabric must be alumina-lime borosilicate Type E glass. The reinforcing fabric must line the entire inner and outer surfaces. Obtain approval for the fabric before production.



## Item 624 – Ground Boxes

- Added aggregate to Payment
  - This price is full compensation for excavating, backfilling, and **aggregate** ...
- Minor clarifications of wording





## Item 625 – Zinc-Coated Steel Wire Strand

- Minor changes



### MATERIALS

Provide new materials in accordance with ASTM A475, ~~Utilities-Grade~~utilities grade or better, Class A coating. These requirements include, but are not limited to, the properties ~~given~~shown in Table 1. Furnish ~~7~~seven wires per strand.

Table 1  
Dimensions and Properties

Nominal Diameter of Strand (in.)	Nominal Diameter of Coated Wires (in.)	<del>Approx.</del> <u>Approximate</u> Weight per 1,000 ft. (lb.)	Minimum Breaking Strength (lb.)	Minimum Zinc Coating <del>Wt.</del> <u>Weight</u> Class A (oz./sq. ft.)
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# Item 600 Series – 2024 Specification Book Rewrite

## Item 627 – Treated Timber Poles

- Minor changes: Wording/punctuation for clarification.
- Updated table 1 to refer to AWPA



~~Butt slivering due to felling is permitted if the distance from the outside circumference is at least 1/4 of the butt diameter and the height is not more than 1 ft. Use preservative treatment in accordance with AWPA U1, Commodity Specification D.~~ Furnish poles with a minimum net retention of preservative treatment in accordance with Table 1.

Mark all poles by branding in accordance with Table 2.

**Table 1**  
Retention of Preservative Treatment

Treatment	Minimum Retention
Creosote	9.0 lb./ft. <sup>3</sup>
Pentachlorophenol	0.45 lb./ft. <sup>3</sup>
CCA	0.6 lb./ft. <sup>3</sup>

**Table 2**  
Timber Pole Markings

Marking	Description of Marking
PTC	Supplier's code or trademark (for example, Pole Treating Company).
F-01	Plant location and year of treatment (for example, Forestville, 2001).
SPC	Species and preservative code (for example, southern pine, creosote).
5-35	Class-length (for example, Class 5, 35-ft. pole).

Place the bottom of the brand squarely on the face of the pole 10 ft. (plus or minus 2 in.) from the butt.

Furnish treated poles in accordance with AWPA to the minimum net retention and penetration of preservative treatment in accordance with Table 1.

**Table 1**  
AWPA Commodity Specification and Use Category for Poles

Product	AWPA Commodity Specification <sup>1</sup>	AWPA Use Category <sup>2</sup>
Poles (southern pine)	D	UC4C

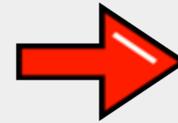
- For minimum preservative retention requirements, refer to AWPA Use Category System Standard U1, Commodity Specification D, for the preservative provided for the southern pine poles. For preservative penetration and assay zone requirements, refer to AWPA Use Category System Standard T1, Commodity Specification D.
- Refer to this designated Use Category when locating the minimum required retention for the provided preservative in AWPA Use Category System Standard U1, Commodity Specification D.

Mark all poles by branding in accordance with Table 2.

**Table 2**  
Timber Pole Markings

Marking	Description of Marking
PTC	Supplier's code or trademark (e.g., Pole Treating Company)
F-20	Plant location and year of treatment (e.g., Forestville, 2020)
SPC	Species and preservative code (e.g., southern pine, creosote)
5-35	Class length (e.g., Class 5, 35-ft. pole)

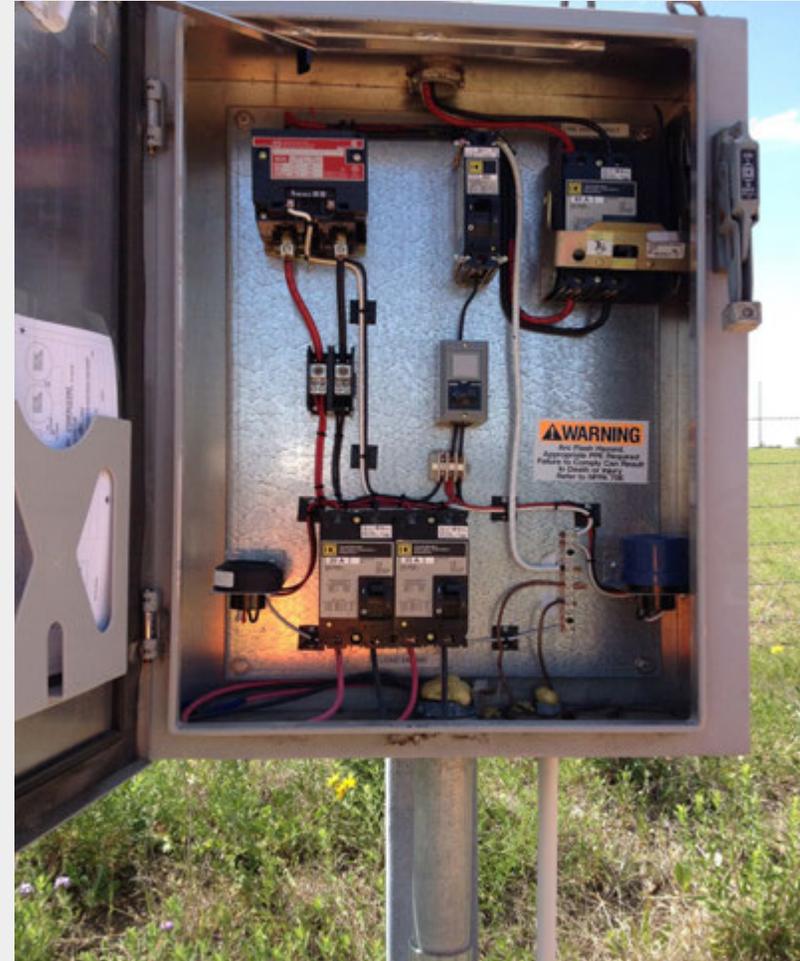
Place the bottom of the brand squarely on the face of the pole 10 ft. (±2 in.) from the butt.





## Item 628 – Electrical Services

- Payment – Added note that permanent service be put in Department's name after construction unless otherwise shown.
- Minor wording changes





## Item 636 – Signs

- Added wording to allow for "replaced" sign supports
- Removed description of "Refurbishing"
- Removed "Sign Blanks", "Sign Face Retroreflectorization", and "Sign Messages" sections and replaced with new section "Signs". New section references DMS-8301 "Highway Sign Fabrication"
- Hardware – Changed wording from "to avoid tearing" to "when in direct contact with"
- Added section for "Sign Identification Decals" referencing DMS-8315, previously shown under Item 643





## Item 636 – Signs, (Cont'd)

- 3.1 - Removed information about "Fabrication" and replaced with "Decals"
- Removed "Refurbishing" section
- Documentation - Consolidated wording about required documentation
- Removed measurement for refurbishing signs
- 5.2 "Replacement" - Added wording to allow existing hardware to be reused (when applicable)
- Removed section 5.3 - "Refurbishing"



## Item 643 – Sign Identification Decals

- This section has been relocated within Item 636

Texas Department of Transportation												
C	Fabrication Date										T	1
J	F	M	A	M	J	J	A	S	O	N	D	2
	201		202		203		204		205			3
	0	1	2	3	4	5	6	7	8	9		4
Sheeting MFR - Substrate												
A	B	C	D	E	F	G	H	J	K	L	M	5
Film MFR												
A	B	C	D	E	F	G	H	J	K	L	M	6
Sheeting MFR - Legend												
A	B	C	D	E	F	G	H	J	K	L	M	7
Installation Date												
				0	1	2	3					8
	0	1	2	3	4	5	6	7	8	9		9
J	F	M	A	M	J	J	A	S	O	N	D	10
	201		202		203		204		205			11
	0	1	2	3	4	5	6	7	8	9		12



## Item 644 – Small Roadside Sign Assemblies

- Added requirement under Item 3.5 Store all signs to be reused off the ground and in a vertical position until erected.





## Item 647 – Large Roadside Sign Supports and Assemblies

- Added Description
  - 1.4 Replacement. Replace existing large roadside sign assemblies.
- Deleted text within 3.2 Installation.
  - "At the Contractor's option, sign supports may be cast in the concrete foundation as a unit. However, if installation is made with the upper post section attached, do not expose the support to traffic until the sign panel is properly affixed, unless otherwise approved."
- Deleted text with 3.3 Relocation.
  - Or lengthen – "Reuse the existing supports and shorten *or lengthen* them as ..."



## Item 650 – Overhead Sign Supports

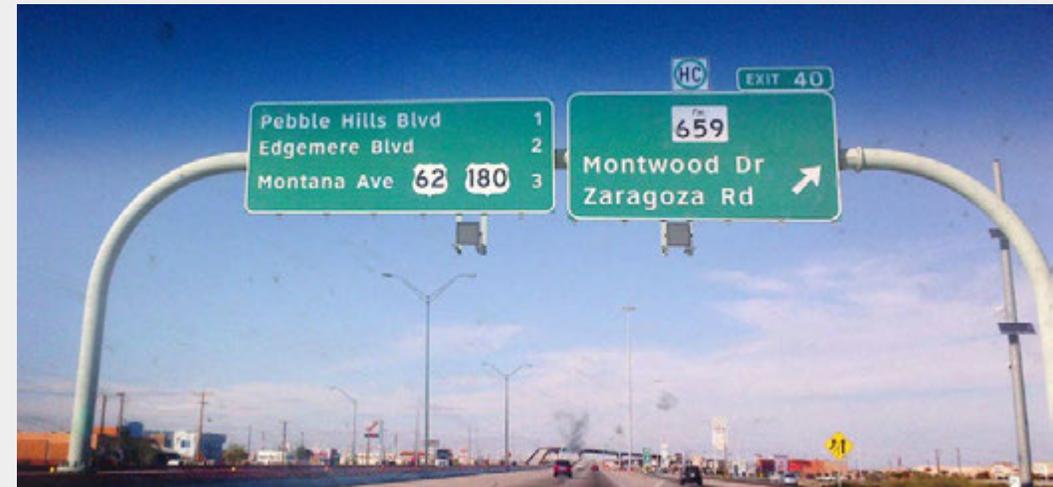
- Added Item 420, "Concrete Sub Structures"
- Added wording to require COSS plan and elevation sheets, COSS & OSB-SZ table sheets, and any other sheets needed to support design calculations
- Changed all instances of "size of pipe" to "pipe diameter and wall thickness"





## Item 650 – Overhead Sign Supports, (Cont'd)

- Added "Tapered columns are permitted if the provided calculations demonstrate that the column is adequate at the level of the truss-to-column connection"
- Added details for monotube-type overhead sign supports
- Added text about Ultrasonic Testing (UT) and measuring required dimensions
- Added text for "mechanically guided thermal cut-holes"





## Item 654 – Sign Walkways

- 3.2 Fabrication (new text in bold)
  - Fabricate and weld sign walkways in accordance with Item 441, the requirements of this Item; and AWS D1.1. **Fabrication plants that produce sign walkways must be approved in accordance with DMS-7380, “Steel Non-Bridge Member Fabrication Plant Qualification.” The Materials and Tests Division maintains a list of approved sign walkway fabrication plants on the Department’s MPL.**



## Item 656 – Foundations for Traffic Control Devices

- No major changes



## Item 658 – Delineator and Object Marker Assemblies

- Added description of "Replacement"
- Simplified phrasing - Changed "in accordance with details" to "as"
- Consolidated paragraphs 1 and 2 under section 3.1 "Installation"
- Removed "Install surface-mount and other types of delineators and object markers in accordance with details shown on the plans"
- Added section 3.3 "Replacement"



## Item 658 – Delineator and Object Marker Assemblies, (Cont'd)

- Consolidated wording into one sentence. Added wording for replacement.
- Clarified wording about plans quantity measurements
- Added "Install High Speed/High Impact Assemblies", "Replace Delineator Assemblies", and "Replace Object Marker Assemblies"
- 5.2 "Removal" – Removed sentence stating that removal is subsidiary to bid items.
- Added section 5.3 "Replacement"



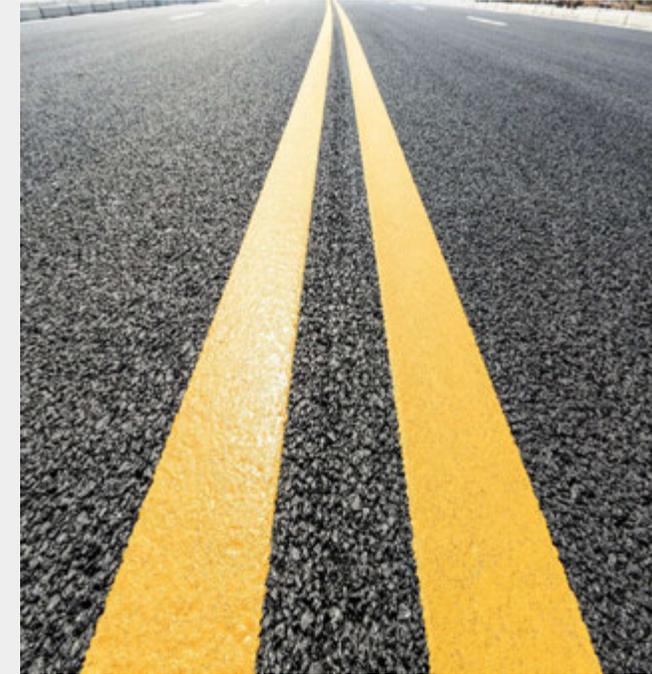
## Item 662 – Work Zone Pavement Markings

- Minor changes
  - 2.1 Nonremovable Markings: Added "paint and beads"
  - 2.2 Removable and Short-term Markings: Added "traffic buttons", also removed "multipolymer pavement markings" to do not use list
  - 3.3 Performance Requirements: Updated visible distance from 300' to 320' (8 skiplines) for daylight conditions



## Item 666 – Reflectorized Pavement Markings

- New guidance on the use of Multipolymer Pavement Markings (MPM)
- Expanded mobile retro-reflectometer specification and TTI Certification requirements
- New 6-inch width requirement for stripping compared to the old 4-inch requirement
- New Type 1, thermoplastic heating requirements
- Expanded direction on when inadequate markings should be replaced, more than 5% of the markings





## Item 666 – Reflectorized Pavement Markings, (Cont'd)

- Expanded surface cleaning, preparation and payment definitions
- Expanded definitions of raised profile markings
- New durability requirements
- New retroreflectivity requirements for each type of pavement markings
- New specifications for High Performance and All-Weather Markings
- Expanded payment definitions for marker types and surface preparation

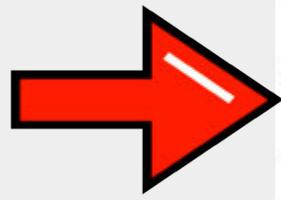
# Item 600 Series – 2024 Specification Book Rewrite



## Item 667 – Mobile Retroreflectivity Data Collection for Pavement Markings

- Special Spec 6438 governs mobile retro data collection and is required for all Item 666 projects
- SS 6438 converted to Item 667

Special Specification 6438	
Mobile Retroreflectivity Data Collection for Pavement Markings	
1.	<b>DESCRIPTION</b> Furnish mobile retroreflectivity data collection (MRDC) for pavement markings on roadways as shown on the plans or as designated by the Engineer. Conduct MRDC on dry pavement only. Provider is defined as the Contractor or Subcontractor who collects the MRDC data.
2.	<b>EQUIPMENT AND PERSONNEL</b>
2.1.	Mobile Retroreflectometer. Provide a self-propelled, mobile retroreflectometer certified by the Texas A&M Transportation Institute (TTI) Mobile Retroreflectometer Certification Program.
2.2.	Portable Retroreflectometer. Provide a portable retroreflectometer that uses 30-meter geometry meeting the requirements described in ASTM E 1710. Maintain, service, and calibrate all portable retroreflectometers according to the manufacturer's instructions.
2.3.	Operating Personnel for Mobile Retroreflectometer. Provide all personnel required to operate the mobile retroreflectometer and portable retroreflectometer. Ensure MRDC system operator has a current certification from the TTI Mobile Retroreflectometer Certification Program to conduct MRDC with the certified mobile retroreflectometer provided.
2.4.	Additional Personnel. Provide any other personnel necessary to compile, evaluate, and submit MRDC.
2.5.	Safety Equipment. Supply and operate all required safety equipment to perform this service.
3.	<b>MRDC DOCUMENTATION AND TESTING</b>
	Document all MRDC by county and roadway or as directed by the Engineer. Submit all data to the Department and to the TTI Mobile Retroreflectometer Certification Program no later than three working days after the day the data is collected. Submit all raw data collected in addition to all other data submitted. Provide data files in Microsoft Excel format or a format approved by the Engineer. Provide measurement notification and field tests as specified. Verification and referee testing may be conducted at the Department's discretion.
3.1.	Preliminary Documentation Sample. Submit a sample data file, video, and map of MRDC data in the required format 10 working days before beginning any work. The format must meet specification and be approved by the Engineer before any work may begin.
3.2.	Initial Documentation Review and Approval. The Department will review documentation submitted for the first day of MRDC, and if it does not meet specification requirements, will not allow further MRDC until deficiencies are corrected. The Department will inform the Provider no later than three working days after submittal if the first day of MRDC does not meet specification requirements. Time charges will continue unless otherwise directed by the Engineer.



Item 667	
Mobile Retroreflectivity Data Collection for Pavement Markings	
1.	<b>DESCRIPTION</b> Furnish mobile retroreflectivity data collection (MRDC) for pavement markings on roadways as shown on the plans or as designated by the Engineer. Conduct MRDC on dry pavement only. Provider is defined as the Contractor or subcontractor that collects the MRDC data.
2.	<b>EQUIPMENT AND PERSONNEL</b>
2.1.	Mobile Retroreflectometer. Provide a self-propelled, mobile retroreflectometer certified by the Texas A&M Transportation Institute (TTI) Mobile Retroreflectometer Certification Program.
2.2.	Portable Retroreflectometer. Provide a portable retroreflectometer that uses 30-meter geometry meeting the requirements described in ASTM E1710. Maintain, service, and calibrate all portable retroreflectometers in conformance with the manufacturer's instructions.
2.3.	Operating Personnel for Retroreflectometer. Provide all personnel required to operate the mobile retroreflectometer and portable retroreflectometer. Ensure MRDC system operator has a current certification from the TTI Mobile Retroreflectometer Certification Program to conduct MRDC using the certified mobile retroreflectometer.
2.4.	Additional Personnel. Provide any other personnel necessary to compile, evaluate, and submit the data obtained from MRDC.
2.5.	Safety Equipment. Supply and operate all required safety equipment to perform this service.
3.	<b>MRDC DOCUMENTATION AND TESTING</b>
	Document all MRDC by county and roadway or as directed by the Engineer. Submit all data to the Department and to the TTI Mobile Retroreflectometer Certification Program no later than 3 working days after the day the data are collected. Submit all raw unmodified data collected in addition to all other data. Provide data files in Microsoft Excel or another approved format. Provide measurement notification and field tests as specified. Verification and referee testing may be conducted at the Department's discretion.
3.1.	Preliminary Documentation Sample. Submit a sample data file, video, and map of MRDC data in the required format at least 10 working days before beginning any work. The format must meet specification and be approved before any work may begin.
3.2.	Initial Documentation Review and Approval. The Department will review documentation submitted for the first day of MRDC, and if it does not meet specification requirements, will not allow further MRDC until deficiencies are corrected. The Department will inform the Provider no later than 3 working days after submittal if the first day of MRDC does not meet specification requirements. Time charges will continue unless otherwise directed by the Engineer.





## Item 668 – Prefabricated Pavement Markings and Rumble Strips

- Expanded definitions of type B & C markings
- Expanded Measurement and Payment definitions
- 3.2 Placement Limitations removed





## Item 668 – Prefabricated Pavement Markings and Rumble Strips, (Cont'd)

- Newly included Rumble Stripe Markings
- Newly included Durability Requirements
- **3.6.1 Durability (new):** Provide materials that do not lose more than 5% of the material in any 1-ft section. Measure the durability with ASTM D913.
- **3.7 Performance Period:** replaced "markings" with "materials"
- **5. Payment:** added "or Prefabricated Rumble Strips of the type, color, and width specified as applicable"



## Item 672 – Raised Pavement Markers

- Minor changes to **2. Materials** section:

- remove hyphen from retro-reflect
- Add II-C-C
- 2 is now "two"

- Changes to **3. Construction** section:

- Added the words "If necessary, remove and replace" and "in accordance to this Item" in paragraph 4.
- Changed "accordance" to "conformance" 12th paragraph
- Added "All RPMs must meet performance requirements for at least 30 calendar days after installation."



**II-C-C**

## Item 600 Series – 2024 Specification Book Rewrite

### Item 677 – Eliminate Existing Pavement Markings and Markers

- **2. Materials** added Item 315, "Fog Seal"
- **4. Construction:** added reference to "Pavement Markings Handbook" for additional information
- **4.1 Surface Treatment Method:** minor rewording for clarification
- **4.2 Burn Method:** added "Ensure the burning heads are not left in one place too long to prevent pavement damage."





## Item 677 – Eliminate Existing Pavement Markings and Markers, (Cont'd)

- **4.3 Blasting Method:** added "high-pressure" to water blasting
- **4.4 Mechanical Method:** added "Do not use flail milling on grooved concrete or porous asphalt.
- **4.5 (new) Corrective Actions:** "Whenever removed markings on asphalt surfaces, continue to simulate pavement markings to and extent determined by the Engineer to cause driver confusion, apply a fog seal or slurry at least 2 ft wide over the area where pavement markings were removed as approved."



## Item 678 – Pavement Surface Preparation for Markings

- **2. Materials:** added "When abrasive blasting is used,"
- **4. Construction:** replaced "blast cleaning" with "blasting methods in accordance with Section 677.4.3 Blasting Method"



## Item 680 – Highway Traffic Signals

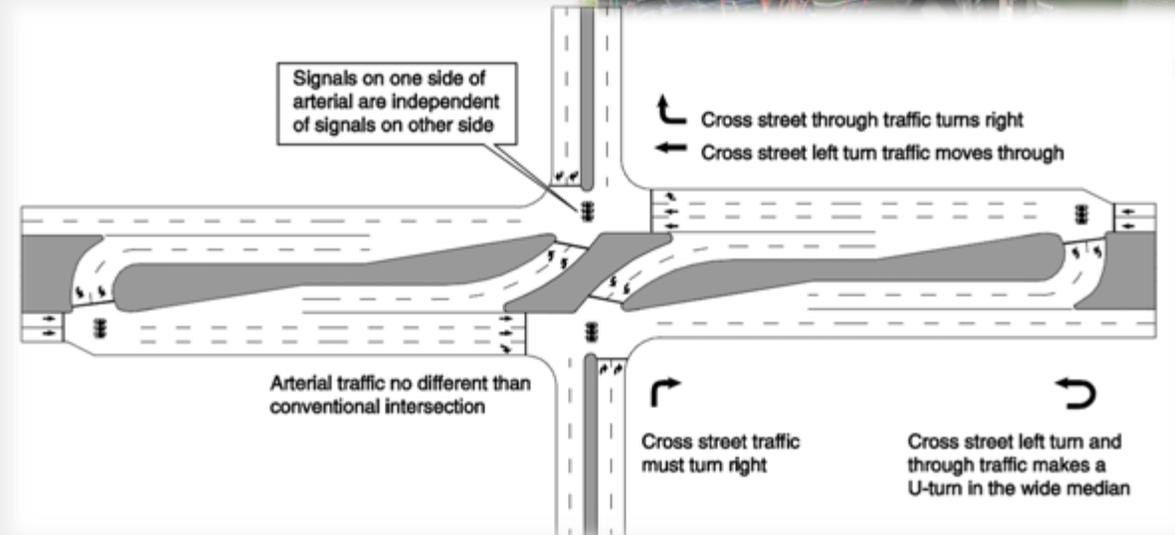
- Updated wiring guidance
  - 14AWG traffic signal cable
  - Cat 6 outer jacket coloring coding
  - Railroad preemption individual conductor color coding
- Cabinet
  - Components
  - Facing and railing





## Item 680 – Highway Traffic Signals (Cont'd)

- Test period response time
- Upgrade
- Payment
  - By Cabinet (e.g. RCUTs)
  - Span wire under 625
  - Signs under 636/SS



Source: FHWA-SA-14-070: Restricted Crossing U-turn Informational Guide.



## Item 681– Temporary Traffic Signals

- Operation and Maintenance
  - Response time (matches Item 680)
  - Remote access (TxDOT provided equipment)
- Portable signals



Source: [www.streetsmartrental.com](http://www.streetsmartrental.com) accessed on 12/21/2023



## Item 682– Vehicle and Pedestrian Signal Heads

- Added "Removal".
- Updated wiring construction guidance.
  - Install drip loop.
  - Only strip outer jacket at point of termination.
  - Guidance on wiring adjustments when removal is used.



Source: Goggle Earth accessed on 12/21/2023



## Item 684– Traffic Signal Cables

- Added "Removal".
- Wiring - added 5 ft extra coiled cable at span wire pole and at each head.



Source: Goggle Earth accessed on 12/21/2023



## Item 685– Roadside Flashing Beacon Assemblies

- Minor changes in language
  - Edits.
  - Removal of extra terms.
  - adding in required wording(e.g., battery and battery box).

- 5.1. **Installation.** This price is full compensation for furnishing, fabricating, galvanizing, assembling, and erecting the roadside flashing beacon assemblies, including poles and bases; solar power flashing controller assemblies, including batteries and battery box; foundations; conduit in the foundation and within 6 in. of the foundation; furnishing and placing anchor bolts, nuts, washers, and templates; controller; and materials, equipment, labor, tools, and incidentals.
- 5.2. **Relocation.** This price is full compensation for removing the roadside flashing beacon assemblies; removing battery box (when required); removing existing foundations; installing new foundations; installing new conduit in the foundation and within 6 in. of the foundation; furnishing, fabricating, and installing any new components as required and replacing the assembly on its new foundations with all manipulations and electrical work; controller; batteries; battery box; salvaging; disposal of unsalvageable materials; loading and hauling; and materials, equipment, labor, tools, and incidentals.



Source: Goggle Earth  
accessed on 12/22/2023



## Item 686– Traffic Signal Pole Assemblies (Steel)

- Added "Removal".
- Expanded language on LMAs



Source: Goggle Earth accessed on 12/21/2023



## Item 687 – Pedestal Pole Assemblies

- Minor changes in language, such as the removal of extra terms, and adding in required wording, such as battery and battery box on relocation.
- Added locking collar.
- Clarified new pedestrian push buttons paid under Item 688.

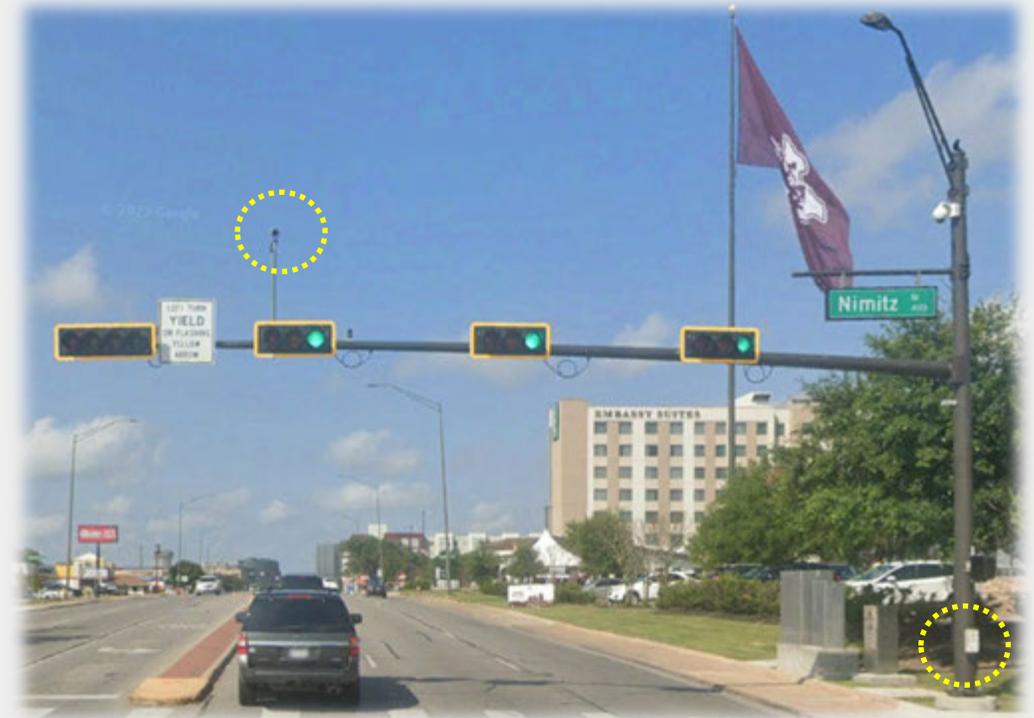


Source: Goggle Earth accessed on 12/21/2023



## Item 688– Pedestrian Detectors and Vehicle ~~Loop~~ Detectors

- Updated language to "Vehicle Detectors".
- Added "Removal".
- SS still needed for VIVDS, RADAR and Hybrid



Source: Goggle Earth accessed on 12/21/2023



## Item 690– Maintenance of Traffic Signals and Illumination

- Response time (matches Item 680).
- Added
  - illumination.
  - screw-in and cabinet foundations.
  - BBU
- Reroute wiring.
- TCP separate cost.
- Updated language throughout.

