



# 2024 Standard Specification Training Seminar





# 2024 Standard Specifications Changes 400 Series Items Structures



- Changes to the Specifications
  - Deleted wording : ~~wording is in red and struck through~~
  - New wording: wording is in green and underlined
  - Changed wording: the ~~old~~ new wording

The information presented is a quick comparison between the 2014 and 2024 Standard Specifications Books.

Due to the number of revisions made, not every change is listed. Multiple Items have changes so significant that a quick comparison would not suffice. To familiarize yourself with the Items of the 2024 Standard Specifications Book, you will need to read the Item Specification in its entirety.



- 62 Items in 2014 Spec Book
- 2 Items are being retired
  - Item 461 Structural Plate Structures
  - Item 497 Sale of Salvageable Material
- 2 “New” Items
  - Item 468 Thermoplastic Pipe Culverts and Drains
  - Item 419 Concrete Sound (Noise) Walls
- 62 Items in 2024 Spec Book



## 1. Description

- No changes

## 2. Materials

- No changes

## 3. Construction

- **3.1.2. Bridge Foundations and Retaining Walls. 2nd Paragraph**
- Collect core samples to determine the character of the supporting materials if requested. Provide an intact sample adequate to judge the character of the founding material. Collect these cores when the excavation is close to completion. Cores ~~should~~ must be approximately 5 ft. deeper than the proposed founding grade.
- 3.2.2. Optional Shaping and Bedding for Precast Concrete Pipe. For precast concrete pipe, the beddings in accordance with ASTM C1479 are permissible.

## 4. Measurement

- ~~4.1.1.2. Structural Plate Structures. No material outside of vertical planes 3 ft. beyond and parallel to the horizontal projection of the outside surfaces of the structure will be included. When the quality of the existing soil or embankment is less than that of the proposed backfill material, the limits of measurement will be extended to vertical planes located 1/2 of the span beyond the horizontal projection of the outside surfaces of the structure.~~



## 5. Payment

- **5.2.2. Structural Excavation Not a Pay Item.** Where special materials for backfill are not required or specified, payment for the authorized removal and replacement of unstable or incompressible material will be measured and paid for at ~~\$15~~ \$18 per cubic yard of material removed. This price is full compensation for removing the unstable or incompressible material; furnishing, hauling, placing, and compacting suitable replacement material; and equipment, labor, tools, and incidentals.
- As shown on the plans or when directed, for the use of special materials such as flexible base, cement-stabilized base, cement-stabilized backfill, or other special material, excavation below the footing grades will be paid for at ~~\$10~~ \$12 per cubic yard. Payment for furnishing, hauling, placing, and compacting the flexible base, cement-stabilized base, cement-stabilized backfill, or other special materials will be made at the unit price bid for these Items, or, if the required material is not a bid Item, in accordance with Article 9.7.

Variance of Revised Footing Grade from Plan Grade	Payment Terms	Variance of Revised Footing Grade from Plan Grade
	“Structural Excavation” is a Bid Item	“Structural Excavation” is Not a Bid Item
Up to and including 5 ft.	Unit price equal to 115% of unit price bid for “Structural Excavation”	<del>\$10</del> <u>\$12</u> per cubic yard
Over 5 ft. up to 10 ft.	Unit price equal to 125% of unit price bid for “Structural Excavation”	<del>\$12</del> <u>\$15</u> per cubic yard
Over 10 ft.	In accordance with Article 9.7.	



1. **Description**
  - No Changes
2. **Materials**
  - No Changes
3. **Construction**
  - Prevent the movement of any inserted structure from its ~~designated~~ specified location.
  - Furnish a mix ~~meeting the requirements of~~ in accordance with Table 2 unless otherwise shown on the plans.
  - Typo Table 2 – “Air dontent” should be “Air content”
  - Transport, strip, and cure the test specimens as scheduled at the ~~designated~~ specified location.
4. **Measurement**
  - No Changes
5. **Payment**
  - No Changes



### 1. Description

- Furnish and place excavation protection for trenches 5 ft. or greater in depth for pipe, box culvert, electrical or telephone conduit, duct, or other utility installation for pipe, box culvert, electrical or telephone conduit, duct, or other utility installation.

### 2. Materials

- No Changes

### 3. Equipment

- No Changes

### 4. Construction

- No Changes

### 5. Measurement

- No Changes

### 6. Payment

- No Changes



### 1. Description

- No changes

### 2. Materials

- ~~– Furnish materials that meet the requirements of Item 423, “Retaining Walls,” when using temporary Mechanically Stabilized Earth (MSE) walls.~~

### 3. Equipment

- No changes

### 4. Construction

- ~~– Construct temporary MSE walls, when used, in accordance with Item 423, “Retaining Walls.”~~

### 5. Measurement

- No changes

### 6. Payment

- No changes



### 1. Description - No Changes

### 2. Equipment

- XX2.1 Driving Equipment – 10th paragraph
- Equip pile drivers with leads constructed to allow freedom of movement of the hammer and to provide adequate support to the pile during driving. The longitudinal axis of the leads, hammer, and pile ~~should~~ must coincide.

### 3. Construction

- XX3.1 Tolerance for Driving. Drive piling to the required vertical or batter alignment, within the tolerances in accordance with this Section. Drive piling with rigid templates when using swinging leads or when necessary to comply with tolerances. Drive battered piles using a two-tiered template or a template equipped with a device to hold the pile at the required batter. Construct the template to allow the pile to pass freely through the template without binding. Cut off piling reasonably square at the elevation as shown on the plans, with a tolerance of no more than 2 in. above or below established cutoff grade. Submit for approval a structural analysis and proposed corrective action, signed and sealed by a licensed professional engineer, when tolerances are exceeded, and the Engineer requires corrective action.
- 3.2 Penetration. Piling lengths shown on the plans are the lengths estimated to provide required bearing and for estimating purposes only. Drive piling to plan tip elevations or to greater depths as necessary to obtain the required allowable dynamic resistance meeting or exceeding the foundation load shown on the plans.

### 4. Measurement & Payment - No Changes



1. **Description** - No Changes
2. **Materials** - No Changes
3. **Equipment** - No Changes
4. **Construction**
  - Perform the foundation load test as shown on the plans and in accordance with the following.
  - ASTM D1143
  - ASTM D4945
  - ASTM D7383
  - [ASTM D8169](#)
5. **Measurement** - No Changes
6. **Payment**
  - Test piling or test shafts [and pertinent reaction piling or shafts](#) that are not part of the permanent structure will not be paid for directly but will be subsidiary to this Item. Test piling or test shafts that are part of the permanent structure will be paid for under the pertinent Items.



### 1. Description

- No Changes

### 2. Materials

- Furnish timber piling in accordance with ASTM D25. Use any species of durable timber for untreated piling that will satisfactorily stand driving. Use Southern pine ~~or Douglas fir~~ impregnated with a preservative for treated piling in accordance with Item 492, “Timber Preservative and Treatment,” or as shown on the plans.
- Furnish round piling in the lengths as shown on the plans, with a minimum circumference of 38 in. for piling 40 ft. or less in length, and 41 in. for piling more than 40 ft. Measure the circumference under the bark at a section 3 ft. from the butt or at the tip.
- **2.1 Inspection.** All piling is subject to inspection before and after treatment. Allow the inspector free access to all sites where materials are being produced or processed and provide any assistance necessary for the proper inspection of materials. ~~The engineer or inspection agency that performed the inspection must brand the butt and tip of each acceptable pile with a marking hammer showing identity of the engineer or inspection agency.~~

### 3. Equipment

- No Changes



### 4. Construction

- 4.1 Splices, Build-Ups, and Cutoffs. Build-up piling by splicing on an additional length of piling of the same diameter and quality when required. Make splices in accordance with the details shown on the plans or as directed. Construct the splice after the pile head and the lower end of the build-up section have been squared up and treated in accordance with Section 406.4.2., “Treatment of Pile Ends.” ~~Use a long enough build-up section to preclude the need for more than 1 splice.~~ Use no more than 1 splice in any single pile.
- 4.2.2. Untreated Timber. Coat the heads of piling thoroughly with a thick protective coat of hot tar, hot asphaltum, ~~or hot creosote.~~

### 5. Measurement

- No Changes

### 6. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- 5<sup>th</sup> Paragraph The Department maintains an MPL of approved paint systems for steel piling.

### 3. Construction

- XX3.2 Painting. Spot-clean and paint in accordance with Item 446. Clean and paint damaged areas, field splices, or areas missing the shop coat with enough epoxy zinc primer to bring the total zinc primer to the minimum ~~3.0~~ 3.5-mil DFT. Follow the repair procedures recommended by the manufacturer of the marine-grade immersion coating system for piling with marine-grade immersion coatings.
- After driving piling, apply at least 2.0 mil DFT of each of epoxy intermediate and polyurethane appearance coating when System III-B is shown on the plans, or apply at least 2.0 mil DFT of the acrylic latex appearance coating when System IV is shown on the plans. ~~Use a concrete gray appearance coating~~ Use an appearance coating in accordance with Federal Standard 595C, Color 35630, unless shown otherwise on the plans. Extend the appearance coat 1 ft. below finished ground line unless the piling is standing in water, in which case extend the appearance coat to the low-water line. Replace any earthen material removed for this painting after the paint has dried.

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- 2.1 Hydraulic Cement Concrete. Use materials in accordance with Item 421, “Hydraulic Cement Concrete.” Provide a neat cement or sand-cement mixture for the grout for soil nail anchors with a 7-day compressive strength of 3,000 psi. Determine grout strength by testing the grout used for the test soil nail anchors in cubes in accordance with ~~Tex-307-D~~ Tex-442-A, “Determining Compressive Strength of Grouts,” or cylinders in accordance with Tex-418-A, “Compressive Strength of Cylindrical Concrete Specimens.” Test further as directed or if the grout mixture is modified. Fly ash may be included in the grout.
- 2.3 Reinforcing Steel. Use materials in accordance with Item 440, “Reinforcement for Concrete.” Provide epoxy-coated reinforcing steel bar of the size and grade as shown on the plans for permanent walls. The minimum allowable epoxy-coating thickness is 12 mils. Temporary walls are not required to provide epoxy-coated steel bars unless otherwise shown on the plans.

### 3. Equipment

- XXFurnish suitable equipment to drill the holes to the specified diameter, depth, and line. Provide a drill rig with an articulating head in the vertical plane and continuous flight augers. If an auger becomes worn to the degree that the drilled hole is less than the required diameter, remove the auger from service until it is repaired and can provide a hole of at least the required diameter. ~~Return the auger to service once it is repaired and can provide a hole of at least the required diameter.~~



### 4. Construction

- No Changes

### 5. Measurement

- 5.2 Verification Tests. Verification tests will be measured by each complete load test satisfactorily performed, reported, and accepted.

### 6. Payment

- 6.1 Proof Tests. Soil nail anchor proof tests will not be paid for directly, but will be subsidiary to this Item.



## 1. Description

- No Changes

## 2. Materials

- 2.1 Hydraulic Cement Concrete. Use materials in accordance with Item 421, “Hydraulic Cement Concrete.” Provide a neat cement or sand-cement mixture for the grout for soil nail anchors with a 7-day compressive strength of 3,000 psi. Determine grout strength by testing the grout used for the test soil nail anchors in cubes in accordance with ~~Tex-307-D~~ Tex-442-A, “Determining Compressive Strength of Grouts,” or cylinders in accordance with Tex-418-A, “Compressive Strength of Cylindrical Concrete Specimens.” Test further as directed or if the grout mixture is modified. Fly ash may be included in the grout.
- 2.3 Reinforcing Steel. Use materials in accordance with Item 440, “Reinforcement for Concrete.” Provide epoxy-coated reinforcing steel bar of the size and grade as shown on the plans for permanent walls. The minimum allowable epoxy-coating thickness is 12 mils. Temporary walls are not required to provide epoxy-coated steel bars unless otherwise shown on the plans.

## 3. Equipment

- XXFurnish suitable equipment to drill the holes to the specified diameter, depth, and line. Provide a drill rig with an articulating head in the vertical plane and continuous flight augers. If an auger becomes worn to the degree that the drilled hole is less than the required diameter, remove the auger from service until it is repaired and can provide a hole of at least the required diameter. ~~Return the auger to service once it is repaired and can provide a hole of at least the required diameter.~~



### 4. Construction

- No Changes

### 5. Measurement

- 5.2 Verification Tests. Verification tests will be measured by each complete load test satisfactorily performed, reported, and accepted.

### 6. Payment

- 6.1 Proof Tests. Soil nail anchor proof tests will not be paid for directly, but will be subsidiary to this Item.



### 1. Description

- No Changes

### 2. Materials

- No Changes

### 3. Construction

- **3.5 Reinforcing Steel** Maintain the minimum length of steel required for lap with column steel. Use dowel bars if the proper lap length is provided both into the shaft and into the column. Locate and tie all dowel bars into the cage before placing concrete ~~or insert dowel bars into fresh, workable concrete.~~
- **3.6 Concrete.** Perform all work in accordance with Item 420, “Concrete Substructures.” Provide concrete with maximum placement temperatures as shown in Table 4. Provide thermal analysis to show, and temperature-recording devices to verify, maximum concrete core temperature requirements are met in accordance with Section 420.4.7.14, “Mass Placements,” for shafts with diameter exceeding 7 ft. Instrument the first shaft for each size shaft exceeding 7 ft. diameter, and as directed if results are not in conformance with Specifications and when the concrete mix design changes.
- Remove loose material and accumulated seep water from the bottom of the excavation before placing concrete. No more than 3 in. of water may be present within the base of the excavation at the time of concrete placement. The rate of inflow must be confirmed by observation to be less than 12 in. per hour. Place concrete using underwater placement methods if seepage exceeds the tolerable levels cited above.



### 3. Construction

- **3.7 Additional Requirements for Slurry Displacement or Underwater Concrete Placement Methods.** Place concrete on the same day the shaft is excavated and as soon as possible after all excavation is complete and reinforcing steel is placed. Rework the hole by over-drilling a minimum 1/2 in. on all sides on the same day that concrete is placed when drilling of a hole is performed on multiple days if approved.

### 2. Measurement

- No Changes

### 3. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- No Changes

### 3. Equipment

- No Changes

### 4. Construction

- **4.7.10 Installation of Dowels and Anchor Bolts.** As shown on the plans, provide an Adhesive Anchor Installer certified by ACI.
- **4.13 Ordinary Surface finish** (2nd bullet point)
- Clean and fill holes or spalls caused by the removal of form ties, etc., with latex grout, cement grout, or epoxy grout as approved. ~~Fill only the holes.~~ Do not blend the patch with the surrounding concrete. ~~On surfaces to receive a rub finish in accordance with Item 427, “Surface Finishes for Concrete,” chip out exposed parts of metals chairs to a depth of 1/2 in. and repair the surface.~~



### 5. Measurement

- No changes

### 6. Payment

- The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for the class of concrete and element identified and by the special designation when appropriate. This price is full compensation for furnishing, hauling, and mixing concrete materials; furnishing, bending, fabricating, splicing, welding and placing the required reinforcement; clips, blocks, metal spacers, ties, wire, or other materials used for fastening reinforcement in place; ~~furnishing, placing, and stressing post-tensioning system;~~ placing, finishing, and curing concrete; mass placement controls; applying ordinary surface finish; furnishing and placing drains, metal flashing strips, and expansion-joint material; excavation, subgrade preparation; and forms and falsework, equipment, labor, tools, and incidentals.



### 1. Description

- No Changes

### 2. Materials

- Natural Pozzolans. Furnish natural pozzolans in accordance with DMS-4635, “Natural Pozzolans.”
- Table 1 added note 1

### 3. Equipment

- Require calibration documentation for Contractor supplied strength testing equipment

### 4. Construction

- Removed Coarse agg. grade for classes of concrete and added requirements for max agg. size
- Reverted to 2004 air entrainment requirements when entrained air is specified
- Allow up to 70% replacement for mass concrete
- Allow lab trial batches

### 5. Acceptance of Concrete

- Added 56-day test specimens

### 6. Measurement & Payment

- Updated concrete evaluation process to include 56-day set of specimens
- Established 7-day deadline for decision



### 1. Description

- No Changes

### 2. Materials

- No Changes

### 3. Equipment

- **3.3. Vibrators.** Provide at least two standby vibrators for emergency use.
- **3.4. Screeds and Work Bridges for Bridge Slabs.** Equip transverse screeds with a pan float and skew kit.

### 4. Construction

- **4.6.5. Preparation of Surfaces.** 4<sup>th</sup> Sentence Ensure the surface of the existing concrete is in an SSD condition just before placing subsequent concrete. Pre-wet the existing concrete by ponding water on the surface for 24 hr. before placing subsequent concrete. Use high-pressure water blasting to achieve SSD conditions 15 -30 min. before placing the concrete if ponding is not possible. An SSD condition is achieved when the surface remains damp when exposed to sunlight for 15 min.
- **4.6.6. Expansion joints** 4<sup>th</sup> and 5<sup>th</sup> paragraph ~~Provide preformed fiber joint material or a high-density foam in the vertical joints of the roadway slab, curb, median, or sidewalk when the plans show a Type A joint and fill the top 1 in. with the specified joint sealing material unless noted otherwise. Install the sealer in accordance with Item 438, "Cleaning and Sealing Joints," and the manufacturer's recommendations.~~
- ~~Use light wire or nails to anchor any preformed fiber joint material to the concrete on 1 side of the joint.~~



### 4. Construction

- **4.11. Final Surface Texture.** Saw-cut grooves in the hardened concrete of bridge slabs, bridge approach slabs, and direct traffic culverts to produce the final texturing after completion of the required curing period unless otherwise noted. Cut grooves ~~perpendicular~~ parallel to the structure centerline. Cut grooves across the slab within 18 in. of the barrier rail, curb, or median divider. Adjust groove cutting at skewed metal expansion joints in bridge slabs ~~by using narrow-width cutting heads~~ so all grooves end within 6 in. of the joint, measured perpendicular to the centerline of the metal joint. Leave no un-grooved surface wider than 6 in. adjacent to either side of the joint. ~~Ensure the minimum distance to the first groove, measured perpendicular to the edge of the concrete joint or from the junction between the concrete and the metal leg of the joint, is 1 in.~~

### 5. Measurement

- No Changes

### 6. Payment

- No Changes



1. Description – No Changes
2. Materials
  - 2.1. General. (Last Paragraph)
    - Construct permanent retaining walls approved for use in accordance with DMS-4800, “Proprietary Earth Retaining Wall System,” and on the Approved System List for Concrete Block Retaining Walls Systems and Mechanically Stabilized Earth Panel Type Systems.
  - 2.2. Definitions.
    - **Mechanically Stabilized Earth (MSE) Wall.** A wall consisting of a volume of select backfill with tensile earth reinforcement elements distributed throughout. Permanent MSE walls use a precast concrete panel as a facing element. Provide the approved MSE-panel type systems in accordance with DMS-4800. Temporary MSE walls use welded wire fabric with filter fabric backing as a facing element.
    - **Concrete Block Wall.** A retaining wall that uses machine-made, precast concrete block units as facing elements. The walls may use a volume of select fill with tensile earth reinforcements distributed throughout, or may use only the facing unit and unit fill weight for support. Provide the approved concrete block retaining wall systems in accordance with DMS-4800.
  - 2.4.2. Select. (5th Paragraph)
    - In addition to the requirements for Type CS select fill, ~~the fraction finer than the No. 200 sieve~~ must have a Plasticity Index (PI) in accordance with Tex-106-E not greater than 6.
  - 2.4.3. Drainage Aggregate for Concrete Block Wall.



### 3. Construction

- **3.3. Submittals. ~~Working Drawings.~~** When proprietary wall systems are used for permanent or temporary walls, submit working drawings, including casting drawings, construction drawings, and design calculations, bearing the seal of a licensed professional engineer for review and approval in accordance with the Department’s Guide to Shop Drawing Submittals process. Upon completion of construction, submit a set of reproducible as-built drawings.
- **3.6. Concrete Block Retaining Walls.** The concrete block units may be sampled and tested by the Engineer before shipment or upon delivery to the construction site. Display samples of block units indicating the color, texture, and finish for approval. Store, transport, and handle all block units carefully to prevent cracking or damage.

### 4. Measurement – No Changes

### 5. Payment

- The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for “Retaining Walls” of the type or special surface finish specified. This price is full compensation for excavation in back of retaining walls and for footings; furnishing and placing footings, leveling pads, copings, and traffic railing foundations; furnishing, placing, and compacting backfill (except in embankment areas), including cement for stabilization; proof rolling; furnishing and placing concrete, reinforcing steel, waterproofing material, ~~filter material and drain pipe~~, joint material, water stop, and filter fabric when required; fabricating, curing, and finishing all panels; furnishing and placing earth reinforcement, anchorage systems, and fasteners; wall erection; and equipment, labor, tools, and incidentals.
- The underdrain filter material and drainpipe will be considered part of the quantities measured and paid for under Item 556.



### 1. Description

- Box Beams. For this Specification, all box beams, X-beams, slab beams, and decked slab beams are referred to as “box beams.”

### 2. Materials

- No Changes

### 3. Equipment

- No Changes

### 4. Construction

- 4.2.1.2. Internal Forms 4th Paragraph

~~– Vent void forms without solid cores to eliminate high air pressure caused by heat of hydration. Insert a 3/4 in. diameter plastic tube into the top of the void before placing concrete and leave it in place until there is no possibility of damage from pressure. Remove the plastic tube afterwards and seal the hole with an approved repair material and procedure.~~



### 4. Construction

- 4.2.3. Placing Reinforcing Steel. 2nd Paragraph
- Weld steel components in accordance with ~~Item 448~~ Item 441, “Steel Structures.”
- ~~4.2.7.1.3. Ponding Method. Use an approved retarder when the air temperature is above 85°F in accordance with the manufacturer’s recommendations if necessary to control concrete slump loss and lengthen the time for placing, consolidating, and finishing operations.~~
- 4.2.7.1.3. Ponding Method. Continuously cover exposed concrete surfaces with standing water.

### 5. Measurement & Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- **2.3. Prestressing Steel.** After bullet points 1st paragraph

~~- Maintain copies of the manufacturer's certified Domestic Certification Form D-9-PS-1 for 7-wire steel strand and supply to the Department upon request.~~

## 3. Construction

- No Changes

## 4. Measurement

- No Changes

## 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- **2.1. Prestressing Steel.** Furnish prestressing steel strand conforming to one of the following types:
  - seven-wire steel strand in accordance with DMS-4500, “Steel Strand, Uncoated Seven-Wire ~~Stress-Relieved and~~ Low-Relaxation for Prestressed Concrete,” or
- **2.2. Post-Tensioning System.** Furnish a post-tensioning system following the minimum requirements for Protection Level 2 (PL-2), or higher protection level as shown on the plans, in accordance with PTI/ASBI M50.
  - The following exceptions apply.(2nd Bullet Point)
  - Provide pre-packaged grouts in accordance with DMS-4670, “Grouts for Post-Tensioning.” ~~and Class C grout per PTI M55.~~ Do not use grouts that exceed the manufacturers’ recommended shelf life or 6 mo. after date of manufacture, whichever is less.

### 3. Equipment

- No Changes



### 4. Construction

- 4.2.3. Grouting Plan. New Requirements for Submittals
- 4.2.4. Stressing Safety Plan. New Article Read
- 4.4. Duct and Prestressing Steel Installation for Post-Tensioning. (Read 2nd & 4th Paragraph)
- 4.5. Grouting. Grout in accordance with PTI M55. Provide grout mock-ups as shown on the plans.
- Table 1 added note 2:
- 2. Verify wet density is within the range established by the manufacturer.

### 5. Measurement

- Read for Major changes—No longer Subsidiary

### 6. Payment

- Read for Major changes—No longer Subsidiary



1. Description - No Changes
2. Materials
  - 2.1.4. Epoxy Waterproofing. Provide Type X epoxy in accordance with DMS-6100, “Epoxies and Adhesives,” or another approved waterproofing epoxy designed to limit the moisture vapor transmission into a concrete or steel surface. Match color of coating with Federal Standard 595C color 35630, concrete gray, unless otherwise shown on the plans.
3. Equipment
  - **3.1. Low-Pressure Water Blasting.** Use equipment capable of supplying a minimum pressure at the nozzle end of 3,000 psi ~~at a minimum flow rate of 3 gpm. Use a 0° rotary, vibratory, or wobble type nozzle. Use equipment capable of including abrasives in the water stream when specified on the plans.~~
4. Construction
  - **4.2.2. Coating Application.** Mix coating materials in conformance with the manufacturer’s instructions
    - ~~4.2.2.2. Concrete Paint~~
    - ~~4.2.2.3. Opaque Sealer~~
    - ~~4.2.2.4. Silicone Resin Paint~~
5. Measurement - No Changes
6. Payment - No Changes



## 1. Description

- No Changes

## 2. Materials

- **2.4 Concrete.** Provide Class C concrete for substructures, Class S concrete for decks, or concrete of the specified design strength unless noted otherwise as follows:

- ~~- as an option for vertical/overhead repairs greater than 6 in. thick;~~
- ~~- for full or partial depth slab repairs;~~
- ~~- for replacement of entire members or elements;~~
- ~~- as an option for horizontal repairs greater than 4 in. thick.~~

2.6. Mechanical and Adhesive Anchors. When mechanical or adhesive anchors are required to bind repair material to the parent concrete, provide anchors conforming to one of the following.

Provide stainless steel expansion anchors. Other anchors, such as galvanized or zinc-painted metal, may be used with approval.

Provide reinforcing steel or threaded stainless steel pins (1/2-inch diameter minimum) anchored in place using a Type III epoxy anchoring adhesive, in accordance with DMS-6100.



### 3. Equipment

- The Engineer may require demonstration of the equipment's abilities.
- 3.1. Abrasive Blasting. Provide equipment capable of removing oil, dirt, slurry, curing compound, laitance, and other similar materials from the surface of the concrete.
- 3.2. Water Blasting. Provide equipment capable of supplying a minimum pressure at the nozzle end of 3,000 psi at a minimum flow rate of 3 gpm. Use a 0° rotary, vibratory, or wobble-type nozzle.
- 3.3. Sawing. Provide equipment capable of sawing concrete to the depth specified when required.
- 3.4. Power-Driven Chipping Tools. Provide tools not heavier than a nominal 30-lb. class for bulk removal of concrete.
- 3.5. Chipping Hammers. Provide chipping hammers not heavier than a nominal 15-lb. class to remove concrete beneath any reinforcing bars.
- 3.6. Hand Tools. Provide applicable hand tools for placing, consolidating, striking-off, and finishing stiff plastic concrete.



### 4. Construction

- Place repair material while the concrete substrate is in a saturated surface dry (SSD) condition. Obtain an SSD condition by applying a high-pressure water blast to the surface for at least 15 min. An SSD condition is achieved when the surface remains damp until the repair material is applied. The surface must be free of standing water. Remove all free (ponded) water just before placing repair material.
- Do not use a proprietary epoxy bonding layer instead of an SSD substrate unless approved. If use of a proprietary bonding agent is authorized, mix it in conformance with the manufacturer's requirements. Use only Department-approved Type V or Type VII material in accordance with DMS-6100.

### 5. Measurement

- Measurement will be made before blending repair edges with parent material in accordance with the Concrete Repair Manual.

### 6. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- No Changes

## 3. Construction

- **3.2 Surface preparation.** 2nd paragraph
- Achieve SSD conditions by high-pressure water blasting 15 to 30 min. before placing the repair material, ~~soaking a minimum of 12 hr., or by other approved methods. An SSD condition is achieved when the surface remains damp when exposed to sunlight for 15 min.~~ An SSD condition is achieved when the surface remains damp until the concrete is applied. The surface must be free of standing water. Remove all free (ponded) water just before placing concrete.

## 4. Measurement

- No Changes

## 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- Major Changes Read Spec Article **2.3 Stone Riprap**. 2nd Paragraph Pay attention to Tables 1 & 3

### 3. Construction

- Major Changes Read Spec Article **3.2 Stone Riprap** Paragraph 3-6

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- **2.1. Plain and Laminated Elastomeric Bearings.** Voided and replaced with the following:

- Manufacturers of plain and laminated elastomeric bearing pads must be approved in accordance with DMS-7365, “Qualification Procedure for Elastomeric Bridge Bearing Pad Manufacturers.” The Materials and Tests Division (MTD) maintains an MPL of approved elastomeric bridge bearing pad manufacturers.

Manufacturers that produce laminated elastomeric bearings with a top steel plate or special components (steel guide bars and bottom plate) must comply with AASHTO’s NTPEP Committee Work Plan for Evaluation of Plain and Laminated Elastomeric Bridge Bearing Manufacturers. DMS-7365 does not apply to manufacturers of bridge bearings where the laminated elastomeric bearing pad is a component of the completed bearing assembly.



### 2. Materials

- **2.1.1 Elastomer.** 6<sup>th</sup> paragraph voided and replaced with the following:
- The Department will perform bond strength testing of laminated prequalification samples in accordance with Tex-601-J, Part I—"Bond Strength Test Method 1." The tested sample must achieve a minimum bond strength of 40 lbf/in. of width. The Department will verify the presence of chlorinated compounds (neoprene) in the elastomer in accordance with Tex-601-J, Part III—"Chlorinated Compound Test Method 3."
- **2.2.1.2 Laminated Elastomeric Bearing Pad and Steel Plate.** Supplemented with the following:
- Bearing manufacturers that produce the laminated elastomeric bearing pad component of a sliding elastomeric bearing must comply with the AASHTO Product Evaluation & Audit Solutions Committee Work Plan for Evaluation of Plain and Laminated Elastomeric Bridge Bearing Manufacturers.
- Elastomeric Bridge Bearing Manufacturers.



### 3. Construction

#### – 3.1.1. Markings.

~~– direction of slope.~~

#### – 3.1.2 Testing and Acceptance. Voided and replaced with the following:

- Perform testing, inspection, and acceptance of plain and laminated elastomeric bearing pads in accordance with DMS-7365.

For laminated elastomeric bearings with a steel top plate or special components (steel guide bars and bottom plate), apply a compression load of 2,250 psi or a stress approved by the Engineer to each bearing. Provide calibrated equipment per ASTM E4 for this compression testing. Each bearing will be acceptable if there is no visible evidence of bond failure or other damage and if the finished bearing meets other pertinent portions of this Item. Samples may be taken if the quality of production becomes questionable.

#### – 3.2.2.1. Lower Component.

- PTFE physical properties in accordance with Table 1, except for Melting Point Testing (ASTM D4894).

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- Use sealants of the class shown on the plans that meet the requirements of DMS-6310, “Joint Sealants and Fillers,” except as modified herein. Use primers recommended by the manufacturer of the sealant if required.
- When a foam-type joint seal is specified, provide one of the listed systems shown on the plans with material meeting the requirements of Section 454.3.4., “Foam-Type Joint Seal.”

### 3. Equipment

- No Changes

### 4. Construction

- When foam-type joint seal is shown on the plans, provide a technician associated with the joint seal manufacturer for training and installation of the initial joint. Provide written instructions from the manufacturer for joint seal installation. Measure all joint openings and size the width of joint seal in conformance with the manufacturer’s specifications.

### 5. Measurement

- No Changes

### 6. Payment

- No Changes



### 1. Description

- Overlay concrete bridge deck surface with concrete overlay (CO), latex-modified concrete overlay (LMC), multi-layer polymer overlay (MLPO), or polyester polymer concrete overlay (PPC).

### 2. Materials

- Major Changes with the addition of multiple materials and removal of ~~2.3.1. Crack Sealant~~

### 3. Equipment

- Major Changes to equipment read spec including:3.2.5. Polyester Polymer Concrete Overlay (PPC). &  
– 3.4. Finishing Equipment for Polyester Polymer Concrete Overlay (PPC).

### 4. Construction of Concrete or Latex-Modified Concrete Overlays

- Major Changes read 4.2.1. Concrete Overlay (CO)., 4.2.2. Latex-Modified Concrete Overlay (LMC)., 4.3. Surface Preparation., & 4.4. Placing and Finishing Concrete.



### 5. Construction of Multi-Layer Polymer Overlay

~~– 5.6. Application of Crack Sealant.~~

– 5.6. Application of Polymer Overlay. & Table 7

### 6. Construction of Polyester Polymer Concrete Overlays(New Articles & Sections)

– 6.1., 6.1.1., 6.1.2., 6.1.4., 6.1.5., 6.2., 6.3., 6.3.1., 6.3.2., 6.3.3., 6.3.4., 6.3.5., 6.4., 6.5., & 6.6.

### 7. Measurement

– CO, LMC, MLPO, and PPC will be measured by the square yard of surface overlaid using the dimensions shown on the plans.

### 8. Payment

– The addition of “Polyester Polymer Concrete Overlay”



## 1. Description

- No Changes

## 2. Materials

- **2.1. Approved Mills.** Significant changes read
- **2.2. Deformed Steel Bar Reinforcement.** Removed Grade 75
- **2.3. Smooth Steel Bar Reinforcement.** ~~Provide smooth bars for concrete pavement with a yield strength of at least 60 ksi~~
- **2.5. Weldable Reinforcing Steel.** Calculate CE using the following formula:  $C.E. = \%C + \%Mn/6$
- **2.7. Welded Deformed Bar Mat Reinforcement.** Provide welded deformed bar mats in accordance with ASTM A184 except as otherwise noted in this Specification. Fabricate welded bar mats from deformed steel bars in accordance with ASTM A706 by securely connecting every intersection with a process of electrical resistance welding that employs the principle of fusion combined with pressure. The bars must be assembled by automatic machines or by other suitable mechanical means that will assure accurate spacing and alignment of all bars of the finished product.



2. **Materials 2.9. Mechanical Couplers.** 2<sup>nd</sup> paragraph voided and replaced with the following:

- Furnish only couplers pre-qualified in accordance with DMS-4510. Ensure sleeve-wedge type couplers are not used on coated reinforcing. Sample mechanical couplers in accordance with Tex-743-I for testing before use on individual projects. Test the mechanical couplers for every project in which mechanical couplers are used in accordance with Tex-744-I. Furnish couplers only at locations shown on the plans.

Provide hot-dip or mechanically galvanized couplers when splicing galvanized reinforcing or CGR.

- **2.11. Low-Carbon and Low-Chromium Reinforcing Steel.** Provide deformed steel bars in accordance with ASTM A1035, Grade 100, Type CS when low carbon and low chromium reinforcing steel is required on the plans. Type CM will be permitted only if specifically allowed as shown on the plans.

~~2.12. Dual-Coated Reinforcing Steel.~~

- 2.12. Glass-Fiber Reinforced Polymer (GFRP) Bars.

- 2.13. Galvanized Reinforcement. Provide galvanized reinforcing steel in accordance with one of the following as shown on the plans:

- zinc-coated, hot-dip galvanized Class I or II steel reinforcement in accordance with ASTM A767, Grade 60 or 80; or
- continuously hot-dip galvanized reinforcement in accordance with ASTM A094 steel reinforcement, Grade 60 or 80.
- Tables 5 & 6 have major changes read carefully



### 3. Construction

- **3.1 Bending.** Supplemented with the following:

Do not bend hot-dip galvanized reinforcement. Only minor positioning adjustments are permitted.

Bending CGR is permitted after galvanizing.

- **3.5 Placing.** 4th paragraph is supplemented with the following:

Use Class 1 or Class 1A supports with CGR.

- **3.7. Repair of Galvanized Reinforcing Steel.** Repair damaged galvanized surfaces in accordance with Section 445.3.4.2. “Repair Processes.”

### 4. Measurement & Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- Major Changes Read Spec Article [2.2 Approved Electrodes and Flux-Electrode Combinations. & 2.4.1.2. Paint Inside Tub Girders and Closed Boxes.](#)

## 3. Construction

- Major Changes Read Spec Article [3.1.5.1. Plants.](#) (2nd paragraph) with bullet points. [3.1.5.2. Personnel.](#) [3.1.5.3. Nondestructive Testing \(NDT\).](#) [3.1.5.4. Welding Procedure Specifications \(WPSs\) Qualification Testing.](#) [3.1.6.1. Erection Drawings.](#) (4th paragraph) [3.1.9. Material Identification.](#) (2nd paragraph) [3.2.5.3. Magnetic Particle Testing \(MT\).](#) [3.8.1. Shop Painting](#) (6th Paragraph)

## 4. Measurement & Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- **2.1.3.3. Fasteners.** Provide high-strength bolts in accordance with ASTM [F3125](#), Grade A325 ~~A490~~, unless otherwise shown on the plans. The Department may sample high-strength bolts, nuts, and washers for structural connections in accordance with Tex-719-I.
- ~~**2.6 Pipe Rail.** “Pipe” includes special extruded and bent shapes. Provide pipe that is rolled, extruded, or coldpressed from a round pipe or flat plate, and of the section shown on the plans. Ensure the design of the cold press and dies results in a pipe of uniform section free from die marks. Cut the pipe to the lengths required once it has been formed to the required section. Make the end cuts and notches at the angles to the axis of the pipe required to produce vertical end faces and plumb posts when required by the plans. Provide a neat and workmanlike finish when cutting and notching pipe.~~

## 3. Construction

- No Changes

## 4. Measurement

- (6<sup>th</sup> Paragraph) The weights of rolled materials (e.g., structural shapes and plate) will be computed based on nominal weights and dimensions using measurements shown on the plans. Deductions will not be made for material that is removed for copes, clips, planing, or weld preparation. [The weight of castings will be computed from the dimensions shown on the plans.](#) Shoes will be measured by the weights shown on the plans.

## 5. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- Table 1 ASTM ~~A153~~ F2329 Bolts, Nuts, Screws, Washers, & Other Miscellaneous Hardware

## 3. Construction

- 3.2.1. Surface Preparation. Do not water-quench or chromate-quench galvanized surfaces to be painted. Prepare the surface in accordance with ASTM D6386 or ASTM D7803, as applicable. Apply coating within 12 hr. of cleaning. Re-clean the surface if more than 12 hr. elapse before initial painting.
- ~~3.3 Galvanizing Weldments. If problems develop during galvanizing of welded material, the Engineer may require a compatibility test of the combined galvanizing and welding procedures in accordance with Section 441.3.2.6., “Testing of Galvanized Weldments,” and may require modification of one or both of the galvanizing and welding procedures.~~

## 4. Measurement & Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- ~~2.1.2. System I-B (Overcoating, High Corrosion Environment).~~
- 2.1.2. System II.
- 2.1.3. System III-A.
- 2.1.4. System III-B.
- 2.1.5. System IV.
- **2.4. Special Protection System (SPS).** Provide the type of paint system shown on the plans or in conformance with Special Provisions to this Item. SPS paints must have completed ~~NTPEP Structural Steel Coatings (SSC)~~ ASHTO Product Evaluation & Audit Solutions Structural Steel Coatings testing regimen as a complete system, with full data available from ~~NTPEP~~ AASHTO unless specified otherwise.



### 3. Equipment

- Provide spray equipment that:
  - has adequate capacity and enough gauges, filters, agitators, regulators, and moisture separators to ensure delivery of clean, dry air in accordance with ASTM D4285 at the proper pressure and volume;
  - ~~will remove moisture from air stream in contact with the paint; and Keep paint pots no more than 20 ft. above or below the level of spray application of paint during painting operations. Do not allow fluid hoses to sag more than 10 ft. below the level of the bottom of the paint pot or actual spraying operations, whichever is the lowest point.~~
  - Submit to the Engineer documentation verifying ~~SSPC QP 1 certification~~ AMPP QP 2 Cat A certification. If the plans specify that the existing coating system does not contain hazardous materials, provide AMPP QP 1 certification.

### 4. Construction

- **Major Changes** important to read about specific Paint System, containment, general preparation, cleaning, application, waste, wastewater, & miscellaneous

### 5. Measurement

- No Changes

### 6. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- **2.2. Bolt Assemblies.** Provide ASTM F3125 bolts, nuts, and washers meeting the type, grade, and finish requirements shown in Table 1, unless otherwise shown on the plans.
- Table 1 added Note 1
- ASTM F3125 high strength structural bolts
- Table 2 updated tension numbers

## 3. Equipment

- No Changes

**Table 2**  
**Bolt Tension**

Nominal Bolt Size (in.)	Minimum Tension (kips)	
	Grade A325 Bolts	Grade A490 Bolts
1/2	12	15
5/8	19	24
3/4	28	35
7/8	39	49
1	51	64
1-1/8	<del>56</del> 64	80
1-1/4	<del>71</del> 81	102
1-3/8	<del>85</del> 97	121
1-1/2	<del>103</del> 118	148



### 1. Construction

- **4.4. Preparation of Faying Surfaces.** Perform blast cleaning or painting of faying surfaces in accordance with Item 441. Provide an **SSPG** AMPP-SP 10 blast cleaning before shipment for weathering steel. Do not wire-brush weathering steel faying surfaces.
- ~~Roughen galvanized faying surfaces by hand wire-brushing. Do not use power wire brushes to roughen galvanized faying surfaces.~~

### 2. Measurement & Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- Use only electrodes and flux-electrode combinations in accordance with AWS A5 specifications and pertinent classifications for the applicable welding processes. When requested, submit a current Certificate of Conformance (COC) containing acceptable wording indicating Buy America compliance and all tests required by the pertinent AWS specifications and welding codes. Tests must be conducted on electrodes of the same class, size, and brand and manufactured by the same process and with the same materials as the electrodes to be furnished. Resubmit electrodes or flux-electrode combinations every 12 mo.

### 3. Equipment

- No Changes

### 4. Construction

- 4.5. Welding Reinforcing Steel. Splice reinforcing steel by welding only at locations as shown on the plans. Before welding galvanized rebar, remove the zinc coating at least 1 in. from either side of the intended weld zone by grinding or equivalent means. After welding, repair the galvanized zinc coating damage in the welded area in accordance with Item 445, “Galvanizing.”

### 5. Measurement & Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- Table 1 High Strength Steel [ASTM F3125](#) Bolt Standard has been added
- **2.3. Threads.** Provide anchor bolts with rolled or cut threads of UNC or 8UN series in accordance with ASME B1.1. [Anchor bolts 1 in. in diameter and smaller](#) and 1-3/4 in. in diameter and larger must have UNC series threads.

### 3. Construction

- **3.1. Fabrication.** (2nd paragraph)
- ~~If the anchor bolts will be installed in a template embedded in concrete, tack weld the anchorage nuts to the template in the shop. Perform this welding with appropriate jigs to ensure the anchor bolt is perpendicular to the template~~

### 4. Measurement & Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- No Changes

## 3. Construction

- **3.1.2. Fabrication.** Fabrication plants that produce metal railing (steel and aluminum) must be approved in accordance with DMS-7395, “Metal Railing Fabrication Plant Qualification.” This required approval does not include fabricators of chain-link fence. The Department maintains an MPL of approved fabrication plants of metal railing.
- Permanently mark each metal railing post base plate, at a visible location when erected, with the fabrication plant’s insignia or trademark. For fabricated rail panels, provide this permanent mark on one post base plate per panel.
- ~~Fabricate stainless steel railing in accordance with AWS D1.3.~~
- ~~3.1.3. Castings.~~
- **3.3. Tests.** 2nd paragraph
- The Engineer will select ~~three~~ five anchor bars or bolts from the first day’s production to be tested after the epoxy has cured.



### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- Use primers recommended by the manufacturer of the sealant when required. Provide backer rods that are circular and are 25% larger than the joint opening. Use backer rods compatible with the sealant that do not react with or bond to the sealant.

### 3. Construction

- **3.3.2. Sealant.** (5<sup>th</sup> & 6<sup>th</sup> Sentence) Apply the primer, when required, at the specified rate and time interval before placing the sealant. Apply the sealant to dry joint surfaces unless otherwise recommended by the sealant manufacturer.
- 3.4. Foam-Type Joint Seal.
- 3.5. Type “A” Joint.

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- See Table 2

Table 2  
Filler Stone Size Requirements

	Cage Height (in.)	Allowable Filler Stone Dimensions	
		Min (in.)	Max (in.)
Gabion mattress	6	3	5
	9	3	5
	12	4	8
Gabion	12	4	8
	18	4	8
	36	4	8

## 3. Construction

- **3.3. Filter Fabric Placement.** Place filter fabric, if required, as shown on the plans. Place the filter fabric with its long axis parallel to the centerline of the structure, highway, or dam. Overlap the uphill or upstream sheet over the downhill or downstream sheet. Ensure adjacent sheets of filter fabric have a minimum overlap of ~~3 ft.~~ 2 ft. in each direction, or, alternatively, provide a minimum overlap of 1 ft. and sew the adjacent sheets of filter fabric together. Lap the ends of rolls at joints by at least ~~3 ft.~~ 2 ft. Secure filter fabric in place with nails or pins. Use 12-in. long, 3/16-in. diameter nails with 1.5-in. washers, or U-shaped steel pins with each leg at least 9 in. long. Space nails or pins at a maximum of 10 ft. in each direction and 5 ft. along the seams. Along the seams, place nails or pins through both strips of filter fabric at approximately the midpoint of the overlap. Place additional nails or pins as necessary to hold the filter fabric in position. Alternative anchorage and spacing may be used when approved. Keep the fabric material free of tension, stress, folds, wrinkles, or creases.

## 4. Measurement

- No Changes

## 5. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- See Table 1

<b>Pipe Type</b>	<b>AASHTO Specification</b>
Galvanized steel and aluminized steel	M 36
Aluminized Type 2	M 36
Polymer - coated	M 245 <del>(M-36)</del>
Asphalt - coated	<u>M 190</u>
Aluminum	M 196

- **2.2. Protective Coating.** Furnish bituminous coating, when required, that meets AASHTO M 190 and that tightly adheres to the metal, does not chip off in handling, and protects the pipe from deterioration ~~as evidenced by samples prepared from the coating material successfully meeting the Shock Test and Flow Test in accordance with Tex 522-G.~~

## 3. Construction

- No Changes

## 4. Measurement

- No Changes

## 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- **2.1. General.** 3rd paragraph
- Furnish material for precast formed and machine-made box culverts in accordance with ~~DMS-7310~~ DMS-7305
- 2.2.2. Precast. Multi-project fabrication plants for precast formed and machine-made box culverts must be approved in accordance with DMS-7305. The Materials and Tests Division maintains a list of approved multi-project precast box culvert fabrication plants on the Department’s MPL. Fabricate precast boxes in accordance with DMS-7305.
- **2.3.2. Precast.** Make, cure, and test compressive test specimens for precast formed and machine-made box culverts in accordance with DMS-7305.
- **2.5. Marking.** Designation “TX” for precast units fabricated in accordance with DMS-7305,
- **2.6.1. Boxes for Jacking Operations.** Variations in laying lengths of two opposite surfaces of the box must not exceed 1/4 in. Defects and Repair. Repair precast boxes, if necessary, in accordance with the annex of DMS-7305. Precast boxes may be rejected for any of the conditions stated in this annex.



### 3. Construction

- No Changes

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- **2.1. Fabrication.** Multi-project fabrication plants, in accordance with ~~DMS-7310~~ DMS-7305
- Furnish material and fabricate reinforced concrete pipe in accordance with ~~DMS-7310~~ DMS-7305.
- **2.3. Marking.** Furnish each section of reinforced concrete pipe marked with the following information in accordance with ~~DMS-7310~~ DMS-7305:
  - designation “TX” for precast units fabricated in accordance with DMS-7305,
- **2.5. Causes for Rejection.** Individual sections of pipe may be rejected for any of the conditions in accordance with the annex of ~~DMS-7310~~ DMS-7305.
- **2.6. Repairs.** Make repairs, if necessary, in accordance with the annex of ~~DMS-7310~~ DMS-7305.



### 3. Construction

- No Changes

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- **2.1. Concrete.** Furnish concrete in accordance with ~~DMS-7310~~ DMS-7305

## 3. Construction

- **3.1. Precast Junction Boxes, Manholes, and Inlets.** Construct formed and machine-made precast junction boxes, manholes, and inlets in accordance with ~~Item 420~~ DMS-7305 and as shown on the plans, except as otherwise specified in accordance with this Item.

- Multi-project fabrication plants that produce junction boxes, manholes, and inlets will be approved by the Materials and Tests Division in accordance with DMS-7305.

### ~~3.1.1. Lifting Holes.~~

- **3.1.1. Marking.** designation “TX” for precast units fabricated in accordance with DMS-7305,

- **3.1.2. Defects and Repair.** Repair precast junction boxes, inlets, and manholes, if necessary, in accordance with the annex of DMS-7305. Precast junction boxes, inlets, and manholes may be rejected for any of the conditions in accordance with this annex.

## 4. Measurement

- No Changes

## 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- **2.2.6. Defects and Repairs.** Occasional imperfections in manufacture or accidental damage sustained during handling may be repaired in accordance with the Department's Concrete Repair Manual. The repaired units will be acceptable if they are in accordance with this Item and the repairs are sound, properly finished, and cured in conformance with pertinent Specifications.

### 3. Construction

- No Changes

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- **2.2.6. Defects and Repairs.** Occasional imperfections in manufacture or accidental damage sustained during handling may be repaired in accordance with the Department's Concrete Repair Manual. The repaired units will be acceptable if they are in accordance with this Item and the repairs are sound and properly finished and cured in conformance with pertinent Specifications. Repair damaged galvanizing in accordance with Section 445.3.5., “Repairs.”

### 3. Construction

- No Changes

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- No Changes

### 3. Construction (2<sup>nd</sup> Paragraph)

- Install concrete pipe in accordance with Item 464, “Reinforced Concrete Pipe.” Install corrugated metal pipe in accordance with Item 460, “Corrugated Metal Pipe.” Install precast concrete box culvert in accordance with Item 462, “Concrete Box Culverts and Drains.”

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Materials

- No Changes

### 3. Construction of Cast-in-Place Trench Drains

- Do not provide removable trench drain grates at any location where wheeled vehicles may drive over them, including roadway lanes, shoulders, and driveways.

### 4. Construction of Precast Trench Drains –No Changes

### 5. Construction of Slotted Drains

- No Changes

### 6. Measurement

- No Changes

### 7. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- ~~– corrugated metal pipe meeting Item 460, “Corrugated Metal Pipe,” of the size, type, design, and dimension shown on the plans~~

## 3. Construction

- No Changes

## 4. Measurement

- No Changes

## 5. Payment

- No Changes



### 1. Description

- No Changes

### 2. Equipment

- **2.1. Micro Milling.** Use concrete milling equipment capable of maintaining constant depth of cut as specified. Equip machine with automated debris collection system. Provide micro-milling drum with tool spacing up to 1/4 in. Do not allow travel speed in feet per minute to exceed 2/3 of the drum revolutions per minute.

### 3. Construction

- **3.1. Micro Milling.**
- **3.2. Hydro-Demolition.**
- Remove plugs after completion of the work. Provide water for hydro-demolition in accordance with Section 421.2.5., “Water,” Table 1.
- Provide remotely operated vacuum unit to reclaim water, debris, and concrete cuttings. Collect water, debris, and concrete cuttings in a separate unit located off the bridge deck. All equipment on bridge deck must be in accordance with Sections 7.16.2., “Construction Equipment Operating on Structures,” and 7.16.3., “Loads on Structures.” Alternate reclamation equipment may be approved, provided a structural analysis, signed, and sealed by a licensed professional engineer, is submitted that considers depth of removal and deterioration of structural elements.



### 3. Construction

#### – 3.2. Hydro-Demolition.

- Do not damage reinforcing steel. If more than 1/2 of the diameter of the reinforcing bar is exposed and the bar is corroded around the circumference, adjacent concrete is rust-stained, or the bar is debonded from the substrate concrete, chip away concrete or water-blast to provide a minimum clearance of 3/4 in. or 1.5 times the largest-size aggregate in the repair material. Stop and recalibrate machine when depth of removal or surface roughness is different from that approved.
- Cold planing or milling operations before hydro-demolition will be subsidiary to hydro-demolition. At minimum, hydro-demolition will be no less than 3/4 in. unless otherwise shown on the plans.

- ~~3.4. Diamond Grinding. Saw-cut transversely the ground areas to provide grooved surface in accordance with Section 483.3.5., “Sawing Grooving,” unless otherwise directed.~~

- ~~3.5 Saw Grooving. Cut grooves into concrete surface perpendicular~~ parallel to the structure centerline. ~~Ensure the minimum distance to the first groove, measured perpendicular to the edge of the concrete joint or from the junction between the concrete and the metal leg of the joint, is 1 in.~~

### 4. Measurement

- No Changes

### 5. Payment

- No Changes



## 1. Description

- No Changes

## 2. Materials

- ~~— **2.3. Structural Glued Laminated Timber.** Meet the grade, species, and other requirements outlined in ANSI/AITC A 190.1, “Structural Glued Laminated Timber.” Bond all members with wet-use adhesive conforming to ASTM D2559. For individual laminations preservative treated before gluing, dry treated laminations to a moisture content of 16% or less and surface all lamination mating faces immediately before gluing.~~
- ~~— Furnish glued laminated timber from a fabricator certified by AITC or who is a member of the APA Engineered Wood Systems (APA EWS) quality assurance program. AITC maintains a list of certified fabricators of structural glued laminated timber. The APA maintains a list of APA EWS trademarked glulam timber fabricators. Provide glued laminated timber marked with an AITC quality inspection mark or an APA EWS trademark as applicable.~~

## 3. Equipment

- No Changes

## 4. Construction

- No Changes

## 5. Measurement

- No Changes

## 6. Payment

- No Changes



**1. Description**

– No Changes

**2. Materials**

– [Table 1 completely revised](#)

**3. Equipment**

– No Changes

**4. Construction**

– No Changes

**5. Measurement**

– No Changes

**6. Payment**

– No Changes

**Table 1  
AWPA Commodity Specification and Use Category by Product**

Product	AWPA Commodity Specification <sup>1</sup>	AWPA Use Category <sup>2</sup>
Round timber piling for land or freshwater use, including foundation piles	E	UC4C
Round timber piling for brackish or saltwater use—marine piles	G	UC5C
Round guard fence posts	B	UC4B
Rectangular guard fence posts	A	UC4B
Guard fence blocks	A	UC4A
Wire fence posts (round)	B	UC4A
Timber and lumber for land or freshwater use	A	UC4C
Timber and lumber for use in brackish or salt water	G	UC5C

1. For minimum preservative retention requirements, refer to this designated commodity specification for each product within Use Category System Standard U1 of AWPA for the preservative and wood species combination provided. For preservative penetration and assay zone requirements, refer to this designated commodity specification for each product within Use Category System Standard T1 of AWPA.
2. Refer to this designated use category for each product when locating the minimum preservative retention requirement in the pertinent commodity specification within Use Category System Standard U1 of AWPA.



## 1. Description

- Raise and support existing structures as shown on the plans. Raising a bridge may be associated with permanent raising to increase vertical clearance or temporary raising to accomplish other work.
- ~~MATERIALS have been removed~~

## 2. Construction

- **2.1. Preparation of Plans.** (2nd Paragraph) If traffic is to be returned on a partially raised bridge affecting roadway elevation, obtain approval of all scenarios of raised condition.
- **2.3. General Construction Requirements.** Verify anchor bolts, closed joints, or other appurtenances do not restrict vertical movement before jacking. Jack spans and beams from the existing bent cap or temporary falsework unless otherwise shown on the plans. Limit the amount of lift as specified below unless the approved engineering plans allow otherwise.
- Loosen and remove all anchor bolt nuts or cut the anchor bolts as approved to allow free vertical movement before raising. Replace all damaged or cut anchor bolts either by butt welding to existing bolts or by drilling into the existing concrete cap a minimum of 12 in. and grouting in new bolts. Do not damage the bent cap reinforcing steel when installing new anchor bolts. Replace all damaged or lost anchor bolt nuts. Weld in accordance with Item 448, “Structural Field Welding.”
- Repair or replace by an approved method any portions of the structure damaged by the raising operation. Repair concrete damage in accordance with Item 429, “Concrete Structure Repair.”



### 2. Construction

- ~~– **2.4. Raising of Spans.** Verify anchor bolts, closed joints, or other appurtenances do not restrict vertical movement before jacking. Jack spans from the existing bent cap or temporary falsework unless otherwise shown on the plans.~~
- ~~– Loosen and remove all anchor bolt nuts or cut the anchor bolts to allow free vertical movement before raising. Replace all damaged or cut anchor bolts either by butt welding to existing bolts or by drilling into the existing concrete cap a minimum of 12 in. and grouting in new bolts. Do not damage the bent cap reinforcing steel when installing new anchor bolts. Replace all damaged or lost anchor bolt nuts. Weld in accordance with Item 448, “Structural Field Welding.”~~
- 2.5. Raising Beams. Raise beams to allow for other work as shown on the plans. Do not raise beam more than 1 in. higher than adjacent beams.
- 2.6. Support Structure. Raise and provide temporary support of existing structure as needed to complete repair work as shown on the plans. Provide adequate material for foundation of shoring and prepare subgrade to prevent settlement for shored structure.

### 3. Measurement

- No Changes

### 4. Payment

- No Changes



HELP

# #EndTheStreakTX

End the streak of daily deaths on Texas roadways.

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