



# Material Inspection Guide September 2025

Materials and Tests Division (MTD)

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# Section 1. Overview

## 1.1 A Look Ahead

This manual outlines the sampling, testing and inspecting procedures and instructions for specific roadway materials. These procedures and instructions aid the project engineer as well as Materials and Tests Division (MTD) personnel in performing sampling, testing, inspecting and related functions. Sections are further divided into the following subsections:

- “Functions of Project Engineer.”
- “Functions of MTD.”
- “Sampling and Testing.”
- “Remarks.”

Other subsections appear as the subject warrants.

## 1.2 Reference

Refer any questions to MTD, using the contact list below.

Section	Contact (Email or Phone)
Quality Assurance	<a href="mailto:MTD_QAP@txdot.gov">MTD_QAP@txdot.gov</a>
Coatings, Calibration and Traffic Materials	<a href="mailto:MTD-Paint@txdot.gov">MTD-Paint@txdot.gov</a>
Flexible Pavements	<a href="mailto:MTD-Flexpave-Engineering@txdot.gov">MTD-Flexpave-Engineering@txdot.gov</a>
Soils and Aggregates	<a href="mailto:MTD-SA-Engineering@txdot.gov">MTD-SA-Engineering@txdot.gov</a>
Rigid Pavements and Concrete Materials	<a href="mailto:Rachel.Cano@txdot.gov">Rachel.Cano@txdot.gov</a>
Structural Materials	(512) 993-7117
Asphalt Binder	<a href="mailto:MTD-Asphalt-Engineering@txdot.gov">MTD-Asphalt-Engineering@txdot.gov</a>

## Section 2. Aggregate for Asphalt-Treated Base (Plant Mixed)

### 2.1 Functions of Project Engineer

The project engineer:

- Samples aggregate in accordance with procedures outlined in [Tex-400-A, "Sampling Aggregate and Stone Riprap,"](#) at a frequency required by the *Guide Schedule of Sampling and Testing* or as specified by the plans.
- Performs job control testing as required by the standard specifications, special specifications, special provisions, *Guide Schedule of Sampling and Testing* and plan notes.
- Provides justification for acceptance of failing project samples, and documents it in SiteManager within 30 days of sample collection.

### 2.2 Functions of MTD

MTD:

- Performs Los Angeles abrasion testing of aggregate used to produce asphalt-treated base plant mix when required by the standard specifications, special specifications, special provisions or plan notes.
- Performs quality testing (wet ball mill, gradation, plasticity index, sand equivalent, decantation and crushed faces), as requested by the districts.

### 2.3 Sampling and Testing

#### ***Project Tests***

Sample in accordance with [Tex-400-A, "Sampling Aggregate and Stone Riprap."](#)

### 2.4 Remarks

When shipping samples to MTD for quality tests, the project engineer uses SiteManager to generate [Form 202, "Identification of Material Samples,"](#) for submission with the sample.

At minimum, document the following information in SiteManager for the fields to populate on each Form 202:

- Month, day and year in which the sample was taken.
- Name of the department employee who obtained the sample, or industry representative for informational samples.

- Type of material (e.g., crushed stone).
- Company name of material producer.
- Location — pit or quarry name or source number.
- Sampled from (e.g., stockpile on project).
- Quantity — estimated quantity of stockpile sampled.
- Units — cubic yards or tons (cubic yards preferred).
- Specification item relating to the sample.
- Identification marks or district number of the sample.

For project-specific samples, include the following additional information:

- Name of area engineer.
- Name of prime contractor.
- Project district.
- Project county.
- Project control, section and job (CSJ) numbers.
- Federal project number.

Los Angeles abrasion testing requires three working days after receipt of the samples.

## Section 3. Aggregate for Bituminous Mixes

### 3.1 Functions of Project Engineer

The project engineer:

- Samples aggregate in accordance with procedures outlined in [Tex-221-F, "Sampling Aggregate and Limestone Rock Asphalt \(LRA\),"](#) or [Tex-400-A, "Sampling Aggregate and Stone Riprap,"](#) at a frequency required by the *Guide Schedule of Sampling and Testing* or as specified by the plans.
- Submits samples of aggregates not in the Aggregate Quality Monitoring Program (AQMP) to MTD for quality testing.
- Performs job control testing as required by the standard specifications, special specifications, special provisions, *Guide Schedule of Sampling and Testing* or plan notes, and when MTD does not maintain resident inspectors at the producer's plant.
- Provides justification for acceptance of failing project samples, and documents it in SiteManager within 30 days of sample collection.

### 3.2 Functions of MTD

MTD:

- Performs quality testing (Los Angeles abrasion, five-cycle magnesium sulfate soundness, surface aggregate classification [SAC] and Micro-Deval) for aggregate on bituminous mixes when required by the standard specifications, special specifications, special provisions or plan notes.
- Administers the AQMP as stated in [Tex-499-A, "Aggregate Quality Monitoring Program."](#)
- Performs quality testing on all samples submitted by the districts.
- Performs job control testing at commercial producers of aggregate for bituminous mixes where MTD maintains resident inspectors and when production of the bituminous mixture is completed by the same producer. In this case, MTD plant inspection test reports are forwarded directly to the project engineer, indicating that the individual aggregates and the bituminous mixture have been tested and are acceptable for use.

### 3.3 Sampling and Testing

#### ***Quality Tests***

- Quality monitoring (QM) sources:
  - District laboratory samples aggregate sources that are under the AQMP when notified by MTD.
  - Sample in accordance with [Tex-400-A, "Sampling Aggregate and Stone Riprap,"](#) or [Tex-221-F, "Sampling Aggregate and Limestone Rock Asphalt \(LRA\)."](#)

- Sampling and testing for quality tests are not required when the published value of the source, as listed in the current *Material Producer List* (MPL) titled “Aggregates (Bituminous Rated Source Quality Catalog),” meets the project specifications.
- Non-QM sources:
  - For aggregate sources not under the AQMP, the district samples each stockpile of material designated for a project in accordance with [Tex 400-A, “Sampling Aggregate and Stone Riprap,”](#) and [Tex-499-A, “Aggregate Quality Monitoring Program.”](#)

### 3.4 Remarks

When shipping samples to MTD for quality tests, the project engineer uses SiteManager to generate [Form 202, “Identification of Material Samples,”](#) for submission with the sample.

At minimum, document the following information in SiteManager for the fields to populate on each Form 202:

- Month, day and year in which the sample was taken.
- Name of the department employee who obtained the sample, or industry representative for informational samples.
- Type of material (e.g., crushed stone).
- Company name of material producer.
- Location — pit or quarry name or source number.
- Sampled from (e.g., stockpile on project).
- Quantity — estimated quantity of stockpile sampled.
- Units — cubic yards or tons (cubic yards preferred).
- Specification item relating to the sample.
- Identification marks or district number of the sample.

For project-specific samples, include the following additional information:

- Name of area engineer.
- Name of prime contractor.
- Project district.
- Project county.
- Project CSJ numbers.
- Federal project number.

Upon receiving, allow 3–4 weeks for testing.

## Section 4. Aggregate for Flexible Base

### 4.1 Functions of Project Engineer

The project engineer:

- Performs job control testing in accordance with [Tex-400-A, "Sampling Aggregate and Stone Riprap,"](#) or [Tex-100-E, "Sampling Soils and Base Materials,"](#) at a frequency required by the *Guide Schedule of Sampling and Testing* or as specified by the plans.
- Performs job control testing as required by the standard specifications, special specifications, special provisions, *Guide Schedule of Sampling and Testing* and plan notes.
- Provides justification for acceptance of failing project samples, and documents it in SiteManager within 30 days of sample collection.

### 4.2 Functions of MTD

MTD tests referee samples as requested by the project engineer in accordance with the specifications.

### 4.3 Sampling and Testing

Sample in accordance with [Tex-400-A, "Sampling Aggregate and Stone Riprap,"](#) or [Tex 100-E, "Sampling Soils and Base Materials,"](#) and the *Guide Schedule of Sampling and Testing*.

### 4.4 Remarks

When shipping samples to MTD for quality tests, the project engineer uses SiteManager to generate [Form 202, "Identification of Material Samples,"](#) for submission with the sample.

At minimum, document the following information in SiteManager for the fields to populate on each Form 202:

- Month, day and year in which the sample was taken.
- Name of the department employee who obtained the sample, or industry representative for informational samples.
- Type of material (e.g., crushed stone).
- Company name of material producer.
- Location — pit or quarry name or source number.
- Sampled from (e.g., stockpile on project).
- Quantity — estimated quantity of stockpile samples.
- Units – cubic yards or tons (cubic yards preferred).
- Specification item relating to the sample.
- Identification marks or district number of the sample.

For project-specific samples, include the following additional information.

- Name of area engineer.
- Name of prime contractor.
- Project district.
- Project county.
- Project CSJ number.
- Federal project number.

Upon receiving, allow 3–4 weeks for testing.

# Section 5. Aggregate for Hydraulic Cement Concrete

## 5.1 Functions of Project Engineer

The project engineer:

- Samples aggregate in accordance with procedures outlined in [Tex 400-A, "Sampling Aggregate and Stone Riprap,"](#) at a frequency required by the *Guide Schedule of Sampling and Testing* or as specified by the plans.
- Submits samples of aggregates not in the AQMP to MTD for quality testing.
- Performs job control testing as required by the standard specifications, special specifications, special provisions, *Guide Schedule of Sampling and Testing* or plan notes.
- Provides justification for acceptance of failing project samples, and documents it in SiteManager within 30 days of sample collection.

## 5.2 Functions of MTD

MTD:

- Performs quality testing (Los Angeles abrasion, five-cycle magnesium sulfate soundness, Micro-Deval and coefficient of thermal expansion) for hydraulic cement concrete aggregate when required by the standard specifications, special specifications, special provisions or plan notes.
- Administers the AQMP in accordance with [Tex-499-A, "Aggregate Quality Monitoring Program."](#)
- Performs quality testing on all samples submitted by the districts.

## 5.3 Sampling and Testing

### **Quality Tests**

- QM sources:
  - District laboratory samples aggregate sources that are under the AQMP when notified by MTD.
  - Sample in accordance with [Tex-400-A, "Sampling Aggregate and Stone Riprap."](#)
  - Sampling and testing for quality tests are not required when the published value of the source, as listed in the current MPL titled "Aggregates (Concrete Rated Source Quality Catalog)," meets the project specifications.
- Non-QM sources:
  - For aggregate sources not under the AQMP, the district samples each stockpile of material designated for a project in accordance with [Tex 400-A, "Sampling Aggregate and Stone Riprap,"](#) and [Tex-499-A, "Aggregate Quality Monitoring Program."](#)

## **Job Control Tests**

Sample in accordance with [Tex 400-A, "Sampling Aggregate and Stone Riprap,"](#) and the *Guide Schedule of Sampling and Testing*.

## **5.4 Remarks**

When shipping samples to MTD for quality tests, the project engineer uses SiteManager to generate [Form 202, "Identification of Material Samples,"](#) for submission with the sample.

At minimum, document the following information in SiteManager for the fields to populate on each Form 202:

- Month, day and year in which the sample was taken.
- Name of the department employee who obtained the sample, or industry representative for informational samples.
- Type of material (e.g., crushed stone).
- Company name of material producer.
- Location — pit or quarry name or source number.
- Sampled from (e.g., stockpile on project).
- Quantity — estimated quantity of stockpile sampled.
- Units — cubic yards or tons (cubic yards preferred).
- Specification item relating to the sample.
- Identification marks or district number of the sample.

For project-specific samples, include the following additional information:

- Name of area engineer.
- Name of prime contractor.
- Project district.
- Project county.
- Project CSJ number.
- Federal project number.

Upon receiving, allow 3–4 weeks for testing.

## Section 6. Aggregate for Surface Treatment

### 6.1 Functions of Project Engineer

The project engineer:

- Samples for job control tests from bins, belts, stockpiles, railroad cars or trucks in accordance with [Tex-221-F, "Sampling Aggregate and Limestone Rock Asphalt \(LRA\)."](#)
- Submits samples of aggregates not in the AQMP to MTD for quality testing.
- Performs job control testing as required by the standard specifications, special specifications, special provisions or plan notes when MTD does not maintain resident inspectors at the producer's plant.
- Provides justification for acceptance of failing project samples, and documents it in SiteManager within 30 days of sample collection.

### 6.2 Functions of MTD

MTD:

- Performs quality testing (Los Angeles abrasion, five-cycle magnesium sulfate soundness, SAC and Micro-Deval) for surface treatment aggregates when required by the standard specifications, special specifications, special provisions or plan notes.
- Administers the AQMP in accordance with [Tex-499-A, "Aggregate Quality Monitoring Program."](#)
- Performs quality testing on all samples submitted by the districts.
- Performs job control testing at commercial plants where MTD maintains resident inspectors. In this case, MTD plant inspection test reports are forwarded directly to the project engineer, indicating that the aggregate has been tested and is acceptable for use.

### 6.3 Sampling and Testing

Sampling and testing for quality tests are not required when the published value of the source, as listed in the current MPL titled "Aggregates (Bituminous Rated Source Quality Catalog)," meets the project specifications.

#### ***Quality Tests***

- QM sources:
  - District laboratory samples aggregate sources that are under the AQMP when notified by MTD.
  - Sample in accordance with [Tex-400-A, "Sampling Aggregate and Stone Riprap,"](#) and [Tex-499-A, "Aggregate Quality Monitoring Program."](#)
- Non-QM sources:

- For aggregate sources not under the AQMP, the district samples each stockpile of material designated for a project in accordance with [Tex 400-A, "Sampling Aggregate and Stone Riprap."](#)

## 6.4 Remarks

When shipping samples to MTD for quality tests, the project engineer uses SiteManager to generate [Form 202, "Identification of Material Samples,"](#) for submission with the sample.

At minimum, document the following information in SiteManager for the fields to populate on each Form 202:

- Month, day and year in which the sample was taken.
- Name of the department employee who obtained the sample, or industry representative for informational samples.
- Type of material (e.g., crushed stone).
- Company name of material producer.
- Location — pit or quarry name or source number.
- Sampled from (e.g., stockpile on project).
- Quantity — estimated quantity of stockpile sampled.
- Units — cubic yards or tons (cubic yards preferred).
- Specification item relating to the sample.
- Identification marks or district number of the sample.

For project-specific samples, include the following additional information:

- Name of area engineer.
- Name of prime contractor.
- Project district.
- Project county.
- Project CSJ number.
- Federal project number.

Upon receiving, allow 3–4 weeks for testing.

## Section 7. Anchor Bolts

### 7.1 Reference

Refer to the standard specifications for information regarding Item 449, "Anchor Bolts."

### 7.2 Functions of Project Engineer

The project engineer:

- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with mill test reports (MTRs) and certifications for all anchor bolts and accompanying nuts and washers. (See [Section 16. Buy America Documentation Program](#).)
- Inspects anchor bolts for full threading, dimensions, fit of the nuts and length of galvanizing/zinc coating.
- Contacts MTD when:
  - Material, threads or coating appear questionable.
  - Fit of bolts and nuts appears to be improper, such as too loose or too tight.
- Verifies that the anchor bolts for traffic signal poles, roadway illumination poles (shoe base and concrete traffic barrier mounted), high mast illumination poles, intelligent transportation system (ITS) poles and overhead sign support structures are lubricated and tightened per Item 449, "Anchor Bolts," when the structure is erected.

### 7.3 Functions of MTD

MTD assists the project engineer when requested.

### 7.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. If sampling is desired, contact MTD for instructions.

## Section 8. Anti-Graffiti Coatings

### 8.1 Overview

This material is an anti-graffiti coating as specified in [DMS-8111, "Anti-Graffiti Coatings,"](#) and Item 740, "Graffiti Removal and Anti-Graffiti Coating."

### 8.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished anti-graffiti coatings are from a department-approved source on the current MPL titled "Paint, Anti-Graffiti."
- Samples coating, one sample per project, and submits to MTD for testing.

### 8.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled "Paint, Anti-Graffiti."

### 8.4 Sampling and Testing

Sample material for testing in accordance with [Tex-736-I, "Sampling Structural Coatings."](#)

### 8.5 Remarks

Coating must be thoroughly agitated before sampling or use. Samples must be shipped in clean friction top cans.

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 9. Anti-Icer/De-Icer Materials

### 9.1 Overview

MTD prequalifies anti-icer/de-icer materials per [DMS-6400, "De-Icer/Anti-Icer."](#)

Anti-icers/de-icers from a department-approved source on the current MPL titled "[De-Icer/Anti-Icer](#)" will not require sampling for testing unless deemed necessary by the engineer.

### 9.2 Functions of Project Engineer

If material is questionable, the project engineer may sample each shipment of salt or anti-icer/de-icer at the destination.

### 9.3 Functions of MTD

MTD:

- Tests samples of salt and other chemical de-icer submitted by the project engineer.
- Issues test reports to the project engineer.
- Maintains the MPL titled "[De-Icer/Anti-Icer.](#)"

### 9.4 Sampling and Testing

Sampling at the destination for testing is not required but may be performed if material is of questionable quality. Sample material, where desired, as follows.

- Submit a 1/2-gallon sample of salt or any other chemical de-icer for each shipment.
- Take sample at random from the shipment using a sampling thief or other means that will assure a representative cross-section of the material.
- Place a solid sample in a plastic bag, sealed in a 1-gallon friction lid bucket for shipment.
- Place a liquid sample in a sealed plastic container.

Allow 10 working days for testing.

## Section 10. Asphalt, Oils and Emulsions

### 10.1 Overview

This section describes general sampling and approval requirements for asphalt, oils and emulsions.

These materials are typically preapproved at the point of origin and should arrive at the jobsite with a shipping ticket showing, at minimum, the supplier, grade and TxDOT laboratory number.

In cases where the material is blended or modified after delivery, the material is approved at the point of use. Sampling and testing must be performed according to a schedule established by the plans and specifications for that project.

### 10.2 Functions of Project Engineer

The project engineer:

- For asphalts approved at the point of origin:
  - Verifies that the MTD laboratory number shown on the producer’s invoice is a valid, passing laboratory number for the appropriate material and supplier.
  - Samples each grade and source of asphalt, oil or emulsion once, per project, when required by the *Guide Schedule of Sampling and Testing*.
  - Collects additional samples as required by particular specification:
    - Item 316 — one sample, per day, per source, to be retained.
    - Items 341, 342, 344, 346, 347 and 348 — one sample, per lot, to be retained.
  - Samples any asphalt, oil or emulsion suspected of being contaminated or not conforming to specification requirements.
  - Samples asphalt from the project that has been stored for more than 1 month.
  - Submits sample to MTD for testing.
  - Provides justification for acceptance of failing project samples, and documents it in SiteManager within 30 days of the binder being used on the project.
  - Rejects materials that are not preapproved or that are improperly identified.
  - Sources materials using the assistant to associate MTD QM samples to the project within 30 days of the binder being used on the project.
  - If the binder source or grade changes, sources materials using the assistant to associate MTD QM samples to the project. This procedure can be found in the *Asphalt Binder Inspection Guide*.

**NOTE:** Asphalts stored on a project more than 1 month are considered to be an unapproved product. Item 310, “Prime Coat,” materials stored on a project beyond the next certification period are considered to be an unapproved product. Sample these products and submit to MTD for reverification and reapproval.

- For asphalts approved at the point of consumption (e.g., asphalt rubber and injected latex):
  - Collect or witness the collection of samples.
  - Perform required field testing on the samples.
  - Submit samples to MTD for laboratory testing.

### 10.3 Functions of MTD

MTD:

- Maintains an MPL of asphalt binder suppliers that are prequalified to supply asphalt to TxDOT projects.
- Samples, tests and preapproves asphalt, oils and emulsions at the source before shipment to department projects.
- Tests and reports any samples submitted by the project engineer with clear indication of whether the material meets the specifications.

### 10.4 Sampling and Testing

Sample in accordance with [Tex-500-C, "Sampling Bituminous Materials, Pre-Molded Joint Fillers, and Joint Sealers."](#)

Use the following sample containers.

- Asphalt cement or performance-graded asphalt — 1-quart (1-liter) double friction top cans.
- Asphalt rubber binders — Two 1-quart (1-liter) double friction top cans.
- Cutbacks — 1-quart (1-liter) screw-top cans.
- Emulsions — 1-quart (1-liter) wide-mouth plastic jars.

Log samples into SiteManager and label according to Tex-500-C and the MTD guidance document titled [Asphalt Binder Inspection and Sampling Guidance](#). The minimum required information for asphalt samples in SiteManager includes:

- Producer.
- Producer facility location.
- Sampler.
- Seal number.
- Bill of lading number.
- Grade.
- District.
- Date sampled.
- Project information, including highway and CSJ numbers.

## 10.5 Reference Documents

Details and guidance for collecting and labeling samples can be found in [Asphalt Binder Inspection and Sampling Guidance](#).

Details of how to create a sample in SiteManager can be found in [Asphalt Binder Inspection and Sampling Guidance](#).

Details of how to associate QM samples with projects in SiteManager can be found in [Asphalt Binder Inspection and Sampling Guidance](#).

Details of how to associate non-test project samples with projects in SiteManager can be found in [Asphalt Binder Inspection and Sampling Guidance](#).

## 10.6 Remarks

Take care to obtain representative samples of asphalt, oils and emulsion using methods described in the sampling procedure. Samples that are not collected in accordance with the test procedure may not be considered suitable for acceptance decisions.

Address any questions regarding asphalt sampling and inspection to the Asphalt Laboratory at (512) 506-5242; [mtd-asphalt-engineering@txdot.gov](mailto:mtd-asphalt-engineering@txdot.gov); or Texas Department of Transportation, MTD, Asphalt Laboratory (CP51), 125 E. 11th St., Austin, TX 78701-2483.

TxDOT reserves the right to randomly sample and test materials.

## Section 11. Bituminous Materials

### 11.1 Overview

Bituminous mixtures include hot-mix asphaltic concrete, hot-mix cold-laid asphaltic concrete, cold-mix LRA, precoated aggregate, asphaltic patching mixes and microsurfacing.

### 11.2 Functions of Project Engineer

The project engineer performs plant inspection, sampling and job control testing, except at commercial producers of bituminous mixtures where MTD maintains authorized inspectors.

### 11.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer, including referee samples.
- Tests re-core referee samples.
- Performs forensic investigations as requested.
- Samples, tests and inspects bituminous mixtures where MTD maintains field office inspectors.
- Issues plant inspection test reports indicating that the material has been inspected and tested and can be unloaded upon arrival at destination.
- Maintains MPLs for prequalified asphaltic patching mixtures.
- Administers statewide proficiency program for Level-1A certified technicians.

### 11.4 Sampling and Testing

When it is necessary for the project engineer to sample at destination, sample in accordance with [Tex-221-F, "Sampling Aggregate and Limestone Rock Asphalt \(LRA\),"](#) or [Tex-222-F, "Sampling Bituminous Mixtures,"](#) and *Guide Schedule of Sampling and Testing*, Table VI; Table VII; Table VIII, "Asphalt Concrete Pavement"; and Table IX, "Microsurfacing."

### 11.5 Remarks

When shipping samples to MTD for quality tests, the project engineer completes and submits [Form 202, "Identification of Material Samples,"](#) or ["Performance Tests 202 Form."](#)

Include the following information (if applicable):

- Month, day and year in which the sample was taken.
- Name of area engineer.

- Name and contact information of the TxDOT employee or industry representative who obtained the sample.
- Name of contractor.
- Name of producer.
- Project district.
- Project CSJ number.
- Federal project number.
- Mix type, including whether the sample is warm-mix asphalt.
- Specification item relating to the sample.
- SiteManager number.
- Actual asphalt grade.
- Rice gravity.
- Identification marks or district number of the sample.
- Tests to be performed.
- Molding information, including number of gyrations and weight.

## Section 12. Bituminous Specialties

### 12.1 Overview

This section describes sampling and testing of miscellaneous materials, including some pre-molded joint and waterproofing materials.

### 12.2 Manufacturer's Certification

The project engineer accepts the following bituminous specialties based on manufacturer's certification:

- Sewer joint compound.
- Plastic cement.
- Cold-applied preformed plastic gaskets.
- Primers for concrete pipe.
- Asphalt mat.
- Asphalt plank.
- Asphaltic panels.
- Asphalt backer board.
- Asphaltic primer for waterproofing.
- Butyl rubber membrane.
- Ethylene-propylene-diene terpolymer (EPDM) sheets.
- Adhesive and splicing cement for butyl rubber and EPDM.
- Pre-molded expansion joint filler.

TxDOT reserves the right to randomly sample and test certified materials.

### 12.3 QM Materials

The project engineer accepts the following materials if MTD has qualified the manufacturer to supply the material:

- Rubber asphalt crack sealer.
- Bituminous marker adhesive.
- Fiber-reinforced polymer patching materials.

Indicate prequalified status by valid QM test report.

MTD makes the QM test reports available as described in [Tex-538-C, "Quality Monitoring for Rubber Asphalt Crack Sealers and Related Materials."](#)

## 12.4 Sampled at Destination

Sample in accordance with [Tex-500-C, "Sampling Bituminous Materials, Pre-Molded Joint Fillers, and Joint Sealers."](#)

The project engineer or other responsible district personnel sample the following materials at the destination, unless other arrangements have been made with MTD before use:

- Waterproofing fabric.
- Waterproofing membrane for pavement joints and cracks.
- Self-adhering polyethylene.
- Rubberized asphalt with plastic film membrane.
- Mopping asphalt, above- and below-ground types.
- Cold asphalt base emulsion.
- Asphaltic polymer and coal-tar modified urethane coating.

## Section 13. Box Culverts (Precast)

### 13.1 Reference

Refer to the standard specifications for information regarding Item 462, "Concrete Box Culverts and Drains."

### 13.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished box culvert sections are from a TxDOT-approved fabricator on the current MPL titled "Reinforced Concrete Pipe and Precast Box Culvert Fabrication Plants," and that the fabricator's designated approval stamp is placed on the box culvert sections.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Inspects precast box culverts received on the jobsite for the following:
  - Excessive cracking and other damage.
  - Proper size and fill height (size and fill height are marked on box culverts).
  - Proper installation.
- Attaches SiteManager QM test reports.
- Advises MTD of unacceptable material received at the jobsite.

### 13.3 Functions of MTD

MTD:

- Provides QA inspection of precast box culverts at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Reinforced Concrete Pipe and Precast Box Culvert Fabrication Plants."
- Assists the project engineer when requested.

## Section 14. Bridge Bearings and Assemblies

### 14.1 References

Refer to the standard specifications for information regarding Item 434, "Bridge Bearings," and Item 442, "Metal for Structures."

### 14.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished plain and laminated elastomeric bridge bearings are from a TxDOT-approved manufacturer on the current MPL titled "Elastomeric Bridge Bearing Pad Manufacturers," and that the manufacturer's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each manufacturer's designated approval stamp.

- Accepts plain or laminated elastomeric bearings, sliding elastomeric bearings, high-load multi-rotational (HLMR) bearings, pedestals and shoes on the basis of the following:
  - Plain or laminated elastomeric bridge bearing pads — Checks each plain or laminated bearing for the fabricator's designated approval stamp, checks for shipping damage and verifies proper field installation of pads (e.g., direction of pad slope and location).
  - Sliding elastomeric bearings — checks each sliding bearing for the TxDOT monogram and checks for shipping damage.
  - HLMR bearings, pedestals and shoes — Checks each HLMR bearing, pedestal and shoe for the TxDOT monogram and checks for shipping damage. Checks for galvanizing damage on pedestals. (See [Section 32. Galvanized Coatings.](#))
- Advises MTD of unacceptable materials received at the jobsite.

### 14.3 Functions of MTD

MTD:

- Provides QA inspection of plain and laminated elastomeric bridge bearings at TxDOT-approved manufacturers.
- Maintains the MPL titled "Elastomeric Bridge Bearing Pad Manufacturers" for manufacturers of plain and laminated bearing pads.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all inspected steel components of bridge bearings manufactured at TxDOT-approved manufacturers.
- Samples, tests, inspects and stamps, with the TxDOT monogram, sliding bearing, HLMR bearings, pedestals and shoes manufactured at locations where MTD performs inspection.

- Issues structural test reports for all bearings and assemblies furnished by TxDOT-approved manufacturers.
- Assists the project engineer when requested.

#### **14.4 Sampling and Testing**

Sampling and testing are not required at the project site.

## Section 15. Bridge Expansion Joints

### 15.1 Reference

Refer to the standard specifications for information regarding Item 454, "Bridge Expansion Joints."

### 15.2 Functions of Project Engineer

The project engineer:

- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for:
  - Sealed expansion joint steel shapes with welded studs.
  - Armor joint steel plates with welded studs.

**NOTE:** See [Section 16. Buy America Documentation Program](#).

- Checks for damage or distortions to the seals and studded steel shapes or plates.
- Verifies that sealed expansion joint system furnished is preapproved as shown on the plans.
- Verifies that materials furnished for header-type expansion joints are from a TxDOT-approved source on the current MPL titled "Polymer Concrete," and that the laboratory number has not expired.
- Verifies that joint sealer material furnished is from a TxDOT-approved source on the MPL titled "Joint Sealers," and that the laboratory number has not expired.

### 15.3 Functions of MTD

MTD:

- Performs tests for preapproval of sealed expansion joint systems.
- Assists the project engineer when requested.
- Maintains the MPLs titled "Polymer Concrete" and "Joint Sealers."

### 15.4 Sampling and Testing

Sampling and testing are not required.

## Section 16. Buy America Documentation Program

### 16.1 Overview

Item 6, "Control of Materials," Section 1.1., "Buy America," requires steel and iron materials (permanently installed) to be manufactured in the United States. Manufacturing begins with initial melting and mixing and continues through fabrication (e.g., cutting, drilling, welding and bending) and coating (e.g., epoxy coating, galvanizing and painting). Section 1.1., "Buy America," also requires a furnished original of Form 1818 (D-9-USA-1), "Material Statement," notarized and with proper attachments, for verification of Buy America compliance. This specification, however, allows minimal use of foreign materials.

MTD developed the Buy America documentation program for the verification of this domestic origin requirement for steel and iron materials.

### 16.2 Reference

Refer to the standard specifications for information regarding Item 6, "Control of Materials."

### 16.3 Definitions

- Certification — A certification is a document furnished by the manufacturer containing the following information: name and address of the manufacturer and the location where the manufacturing process occurred (if different from the address); manufacturing steps performed by the manufacturer; heat numbers, lot numbers or any other identification used to identify the material; and a notarized statement from the manufacturer, attesting to the domestic origin of the material and signed by a person who can legally represent the manufacturer.
- Domestic origin — Domestic origin means with all manufacturing processes occurring in the United States.
- MTR — An MTR for steel or iron is a report from the producing mill of the base metal listing the chemical analysis; physical analysis; heat or lot number; specification used to manufacture the material; and domestic clause stating that the steel or iron was melted and manufactured in the United States, or that all manufacturing processes for the steel or iron occurred in the United States. Reporting of the chemical and physical analysis must be as required by the applicable specification; e.g., American Society for Testing and Materials (ASTM), American Association of State Highway and Transportation Officials (AASHTO) and American National Standards Institute.
- Supplier — A supplier is one that offers a material or finished product to TxDOT or contractors of TxDOT. A supplier may be a prime contractor, subcontractor, producer, fabricator, manufacturer or approved warehouse.

## 16.4 Responsibilities

The responsibilities of the project engineer and MTD are as follows.

### ***Steel and Iron Items Inspected and Tested by MTD***

- Project engineer receives MTD structural test reports as proof of compliance with the requirements of the specifications.
- MTD obtains from the supplier a completed Form 1818 (D-9-USA-1), "Material Statement," (see [Section 16.5, "Documentation"](#)) with attachments such as MTRs, certifications and galvanizing reports.

### ***Steel and Iron Items Received and Sampled by the Project Engineer for Testing by MTD***

- The project engineer:
  - Submits samples with the required documentation obtained from the supplier (e.g., completed Form 1818 [D-9-USA-1], "Material Statement," with attached MTRs, certifications and galvanizing reports) to MTD for testing.
  - Receives MTD general test report for all passing material (proof of compliance with the requirements of the specifications).

### ***Steel and Iron Items Received, Inspected and Accepted by the Project Engineer***

- Project engineer obtains from the supplier the completed Form 1818 (D-9-USA-1), "Material Statement," (see [Section 16.5, "Documentation"](#)) with attachments such as MTRs, certifications and galvanizing reports.
- MTD assists the project engineer when requested.

### ***Steel and Iron Items Received from Regional or District Warehouse (Pretested) Stock***

- Project engineer:
  - Obtains documentation verifying the material was obtained from a regional or district warehouse.
  - When requested to inspect and test, obtains from the supplier the completed Form 1818 (D-9-USA-1), "Material Statement," (see [Section 16.5, "Documentation"](#)) with attached MTRs, certifications and galvanizing reports.

### ***Reinforcing Steel Used in Concrete***

Form 1818 (D-9-USA-1), "Material Statement," is not required for reinforcing steel used in concrete. Project engineer obtains only MTRs and any applicable coating certifications for reinforcing steel furnished in accordance with Item 440, "Reinforcement for Concrete."

## 16.5 Documentation

The supplier must furnish the following form for verifying Buy America requirements (domestic origin) of steel and iron materials:

- Form 1818 (D-9-USA-1), "Material Statement" — This form is available from TxDOT and is to be completed and furnished per Item 6, "Control of Materials," by the supplier. This form, when completed, should contain the requested information with attachments such as MTRs, certifications and galvanizing reports.

**WARNING:** If a supplier is possibly providing improper or falsified documentation, the TxDOT entity responsible for acceptance of the material (division or district warehouse, project engineer or MTD) must notify the supplier in writing regarding the problem and take appropriate action. The Texas Attorney General's Office will be notified of major violations.

## Section 17. Chain Link Fence

### 17.1 Reference

Refer to the standard specifications for information regarding Item 550, "Chain Link Fence."

### 17.2 Functions of Project Engineer

The project engineer:

- Accepts chain link fence on the basis of certification from the manufacturer stating that all fencing materials comply with the requirements of Item 550, "Chain Link Fence."
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports. (See [Section 16. Buy America Documentation Program.](#))
- Visually inspects for the following:
  - Damage or defects in the galvanized coating. (See [Section 32. Galvanized Coatings.](#))
  - Zinc daggers or icicles. Long, sharp projections of zinc, if minor, are acceptable if removed by filing. Watch for brittle coating.
- Advises MTD of questionable material received at the jobsite.

### 17.3 Functions of MTD

MTD assists the project engineer when requested.

### 17.4 Sampling and Testing

If the material is of questionable quality, the project engineer may obtain samples in accordance with [Tex-708-I, "Sampling Galvanized Metal Products for Coating Weight,"](#) for galvanized coating testing.

## Section 18. Concrete Admixtures

### 18.1 Overview

The chemical admixtures for concrete specifications are outlined in [DMS-4640, "Chemical Admixtures for Concrete."](#) It includes admixtures for air entrainment, water reduction, retardation, acceleration, water reduction and retardation, water reduction and acceleration, high-range water reduction, high-range water reduction and retardation, and latex. [DMS-4640, "Chemical Admixtures for Concrete,"](#) is referenced in Item 421, "Hydraulic Cement Concrete."

### 18.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished concrete admixtures are from a TxDOT-approved source on the current MPL titled "Chemical Admixtures for Concrete."
- Obtains copies of the contractor's invoices showing the admixture or admixtures to be used on the project.
- When changing brands of admixtures, conducts trial batches using the materials that will be used on the project.
- Samples any admixture of questionable quality and submits to MTD for testing.
- Approves the use of chemical admixtures not included on TxDOT's MPL. (See [Section 18.5, "Remarks."](#))

### 18.3 Functions of MTD

MTD:

- Samples, pretests and approves concrete admixtures in the laboratory.
- Maintains the MPL titled "Chemical Admixtures for Concrete."
- Tests concrete admixture samples submitted by the project engineer.

### 18.4 Sampling and Testing

- Sampling frequency — sample if questionable quality or when deemed necessary.
- Sample size — 1-pint plastic bottle.

### 18.5 Remarks

Follow the manufacturer's storage instructions and agitate any admixture stored for an extended period before use.

Do not mix different brands or types of admixtures before use or introduce them into the mix simultaneously.

Any admixture proposed for use that is not on TxDOT's MPL will require at least 12 months to test.

For Type S, "Specific Performance Admixtures for Concrete," the project engineer is responsible for approving the use of Type S admixtures when they are not specified on the plans. Document the justification for using Type S admixtures and ensure they meet requirements outlined in ASTM C494, "Standard Specification for Chemical Admixtures for Concrete." For assistance in reviewing the use of Type S chemical admixtures, contact MTD.

# Section 19. Concrete Membrane Curing Compounds

## 19.1 Overview

Refer to [DMS-4650, "Hydraulic Cement Concrete Curing Materials and Evaporation Retardants,"](#) for information regarding these materials.

Concrete membrane curing compound is sampled at the point of manufacture and submitted to MTD for testing.

Curing compound will be delivered to the project only in the manufacturer's original containers, which must be clearly labeled with the brand name of the compound, the type of compound, expiration date and a producer's batch number with which test samples may be correlated.

## 19.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished concrete membrane curing compound is from a TxDOT-approved source listed on the current MPL titled "Concrete Curing Compounds (Liquid Membrane-Forming)."
- Samples material of questionable quality received at the jobsite if desired.
- Ensures that curing compounds are thoroughly agitated before use or sampling.
- Ensures that product is not diluted before or during application.

## 19.3 Functions of MTD

MTD:

- Samples and tests for QA at origin or jobsite to ensure conformance to TxDOT specifications.
- Maintains the MPL titled "Concrete Curing Compounds (Liquid Membrane-Forming)."
- Tests samples submitted by the project engineer.

## 19.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample questionable material for testing, if desired, in accordance with [Tex-718-I, "Sampling Liquid Membrane-Forming Compounds for Curing Concrete."](#)

## 19.5 Remarks

Curing compounds must be thoroughly agitated before sampling, and samples must be shipped in new friction top cans.

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

# Section 20. Concrete Repair Material – Inorganic Cementing Materials

## 20.1 Overview

This material is an inorganic cementing material with specifications as outlined in [DMS-4655, "Concrete Repair Materials."](#) It includes rapid repair materials (Type A), ultra-rapid repair materials (Type B), vertical or overhead repair materials (Type C) and standard (non-rapid) repair materials (Type D). The container or package must be moisture-resistant and clearly marked with the product name, manufacturer and brand names, date of manufacture, lot number and mixing/placing instructions. [DMS-4655, "Concrete Repair Materials,"](#) is referenced in standard specification Items 361, 429, 431 and 720.

## 20.2 Functions of Project Engineer

The project engineer:

- Obtains copies of the contractor's invoice showing the concrete repair materials to be used on the project.
- Verifies that furnished concrete repair materials are from a TxDOT-approved source on the current MPL titled "Concrete Repair Materials."
- Samples any concrete repair material of questionable quality and submits to MTD for testing.

## 20.3 Functions of MTD

MTD:

- Samples, pretests and approves concrete repair materials in the laboratory.
- Maintains the MPL titled "Concrete Repair Materials."
- Tests concrete repair material samples submitted by the project engineer.

## 20.4 Sampling and Testing

- Sampling frequency — sampling at the jobsite for testing is not required but may be performed if material is of questionable quality.
- Sample size — when sampling is desired, submit approximately 300 pounds of concrete repair material to MTD in moisture-resistant containers from the original package.

## 20.5 Remarks

When submitting samples to MTD, show complete information on [Form 202, "Identification of Material Samples."](#)

# Section 21. Concrete Repair Material – Polymeric Materials

## 21.1 Overview

This material is for patching spalls in concrete pavement using specifications as outlined in [DMS-6170, "Polymeric Materials for Patching Spalls in Concrete Pavement."](#) It includes polymeric flexible material (Type I) and polymeric semi-rigid material (Type II). The container or package must be moisture-resistant and clearly marked with the product name, manufacturer name and other information as set forth in the applicable specifications. [DMS-6170, "Polymeric Materials for Patching Spalls in Concrete Pavement,"](#) is referenced in Item 720, "Repair of Spalling in Concrete Pavement."

## 21.2 Functions of Project Engineer

The project engineer:

- Obtains copies of the contractor's invoice showing the concrete repair materials to be used on the project.
- Verifies that furnished concrete repair materials are from a TxDOT-approved source on the current MPL titled "Polymeric Materials for Patching Spalls in Concrete Pavement."
- Samples any concrete repair material of questionable quality and submits to MTD for testing.

## 21.3 Functions of MTD

MTD:

- Samples, pretests and approves concrete repair materials in the laboratory.
- Maintains the MPL titled "Polymeric Materials for Patching Spalls in Concrete Pavement."
- Tests concrete repair material samples submitted by the project engineer.

## 21.4 Sampling and Testing

- Sampling frequency — sampling at the jobsite for testing is not required but may be performed if material is of questionable quality.
- Sample size — when sampling for testing is required or desired, sample polymeric concrete repair material in accordance with [Tex-734-I, "Sampling Epoxy."](#)

## 21.5 Remarks

When submitting samples to MTD, show complete information on [Form 202, "Identification of Material Samples."](#)

## Section 22. Concrete Repair Material — Pneumatically Applied Materials

### 22.1 Overview

This material consists of pneumatically applied concrete or mortar as outlined in Item 431, “Pneumatically Placed Concrete,” and [DMS-4655, “Concrete Repair Materials.”](#) Use pre-bagged concrete materials for concrete structure repair unless otherwise shown on the plans.

### 22.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished concrete repair materials are from a TxDOT-approved source on the current MPL titled “Concrete Repair Materials,” Type C.
- Samples pre-bagged materials for testing (if desired).
- Performs the following for mix design approval:
  - Observes measuring and mixing of component materials.
  - Observes application of concrete for installation test panels.
  - Verifies curing, sampling and testing of test panels.

### 22.3 Functions of MTD

MTD:

- Samples, pretests and approves concrete repair materials in the laboratory.
- Maintains the MPL titled “Concrete Repair Materials.”
- Tests concrete repair material samples submitted by the project engineer.

### 22.4 Sampling and Testing

Sample and test installation test panels per Item 431, “Pneumatically Placed Concrete.”

When sampling of pre-bagged materials for testing is desired, obtain instructions from MTD.

### 22.5 Remarks

Show complete information on [Form 202, “Identification of Material Samples.”](#)

## Section 23. Concrete Surface Finishes

### 23.1 Overview

These materials are for coating concrete surfaces in accordance with Item 427, "Surface Finishes for Concrete." They include adhesive grout, concrete paint, opaque sealer and silicone resin emulsion paint (SREP).

Refer to [DMS-8110, "Coatings for Concrete,"](#) for information regarding adhesive grout, concrete paint and opaque sealer, and [DMS-8141, "Paint, Silicone Resin for Concrete,"](#) for information regarding SREP.

### 23.2 Functions of Project Engineer

The project engineer:

- Verifies that the furnished adhesive grout, concrete paint and opaque sealers are from a TxDOT-approved source on the current MPL titled "Surface Finishes for Concrete."
- Verifies that the furnished SREP is from a TxDOT-approved source on the current MPL titled "Paint, Silicone Resin."
- Samples containers (one sample per project) and submits to MTD for testing.
- Samples material of questionable quality received at the jobsite (if desired).

### 23.3 Functions of MTD

MTD:

- Maintains the MPL titled "Surface Finishes for Concrete" and "Paint, Silicone Resin."
- Tests project samples submitted by the project engineer.
- Assists the project engineer when requested.

### 23.4 Sampling and Testing

Sample material for testing in accordance with [Tex-736-I, "Sampling Structural Coatings."](#)

### 23.5 Remarks

Paint must be thoroughly agitated before sampling or use. Samples must be shipped in clean friction top buckets/cans.

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 24. Concrete Traffic Barrier (Precast)

### 24.1 References

Refer to the standard specifications for information regarding the following:

- Item 512, "Portable Traffic Barrier."
- Item 514, "Permanent Concrete Traffic Barrier."

### 24.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished precast concrete traffic barrier, fabricated at a multi-project fabrication plant, is from a TxDOT-approved fabricator on the current MPL titled "Concrete Traffic Barrier Fabrication Plants (Multi-Project)" and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** Item 424, "Precast Concrete Structural Members (Fabrication)," defines multi-project fabrication plants. See the MPL for each fabricator's designated approval stamp. When portable barrier is to be furnished and then retained by the contractor, barrier from nonapproved sources or previously used barrier may be provided if the contractor submits written certification of specification compliance. (See Item 512, "Portable Traffic Barrier.")

- Attaches SiteManager QM test report for precast concrete traffic barrier furnished by TxDOT-approved multi-project plants.
- Advises MTD when items of unacceptable quality are received on the jobsite.

### 24.3 Functions of MTD

MTD:

- Provides QA inspection of concrete traffic barrier at TxDOT-approved multi-project fabrication plants.
- Maintains the MPL titled "Concrete Traffic Barrier Fabrication Plants (Multi-Project)."
- Assists the project engineer when requested.

## Section 25. Corrugated Metal Pipe

### 25.1 References

Refer to the standard specifications for information regarding the following:

- Item 460, "Corrugated Metal Pipe"
- Item 467, "Safety End Treatment"

### 25.2 Functions of Project Engineer

The project engineer:

- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports for the steel components. (See [Section 16. Buy America Documentation Program.](#))
- Inspects corrugated metal pipe or corrugated metal end sections for compliance with the specifications (e.g., dimensions, type and gauge), damage and workmanship.
- Rejects pipe or end sections that have been damaged during fabrication or in shipping, unless satisfactory repairs are made. Defects constituting poor workmanship are:
  - Variation from a straight centerline.
  - Elliptical shape in pipe intended to be round.
  - Dents or bends in the metal.
  - Damaged galvanized, bituminous or polymer coating. (See [Section 32. Galvanized Coatings.](#))
  - Lack of rigidity.
  - Illegible or omitted brand markings (brand must show name of manufacturer, heat number and AASHTO specification).
  - Ragged or diagonal sheared edges.
  - Uneven laps in riveted or spot-welded pipe.
  - Loose, unevenly lined or unevenly spaced rivets.
  - Defective spot welds or continuous welds.
  - Loosely formed lockseams.
- Advises MTD if questionable material is received on the jobsite.

### 25.3 Functions of MTD

MTD assists the project engineer when requested.

## **25.4 Sampling and Testing**

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Perform sampling, if desired, in accordance with [Tex-708-I, "Sampling Galvanized Metal Products for Coating Weight."](#)

## Section 26. Delineators, Object Markers and Barrier Reflectors

### 26.1 Overview

The specifications for these materials are outlined in [DMS-8600, "Delineators, Object Markers, and Barrier Reflectors."](#) DMS-8600 is referenced in Item 658, "Delineator and Object Marker Assemblies."

### 26.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished barrier reflectors are from a TxDOT-approved source on the current MPL titled "Barrier Reflectors."
- Visually inspects Types 1, 3 and 4 object marker panels for the following:
  - Dents, warps and other conditions of the aluminum substrate that may affect the panel functionality.
  - Proper size.
  - Face damage that affects the panel functionality and durability, such as scratches in the reflective sheeting wider than 1/16 inch or greater than 6 inches in length; damage in the reflective sheeting that penetrates the sheeting backing; or reflective sheeting with ragged edges, cracks, blisters or streaks.
- Sample material of questionable quality received at the jobsite if desired.

### 26.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled "Barrier Reflectors."

### 26.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample delineator and object marker reflector units, if desired, in accordance with [Tex-725-I, "Sampling Delineator and Object Marker Reflector Units and Barrier Reflectors."](#)

### 26.5 Remarks

See [Section 27. Delineator and Object Marker Posts](#) for the reflector unit supports.

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 27. Delineator and Object Marker Posts

### 27.1 Overview

The specifications for some of these materials are outlined in [DMS-4400, "Flexible Delineator and Object Marker Posts \(Embedded and Surface-Mount Types\)."](#) DMS-4400 is referenced in Item 658, "Delineator and Object Marker Assemblies."

### 27.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished flexible posts are from a TxDOT-approved source on the MPL titled "Flexible Delineator and Object Marker Posts."
- Samples material of questionable quality received at the jobsite.
- Verifies that thin-walled tubing post wedge anchor systems are from a source approved by the Traffic Safety Division (TRF).
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports for wing channel posts. (See [Section 16. Buy America Documentation Program.](#))
- Visually inspects steel posts for damage or defects in the galvanizing coating. (See [Section 32. Galvanized Coatings.](#))

### 27.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled "Flexible Delineator and Object Marker Posts."

### 27.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample flexible posts, if desired, in accordance with [Tex-737-I, "Sampling Flexible Delineator and Object Marker Posts."](#)

### 27.5 Remarks

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 28. Elastomeric Materials

### 28.1 Reference

Refer to [DMS-6160, "Water Stops, Nylon-Reinforced Neoprene Sheet, and Elastomeric Pads."](#)

### 28.2 Functions of Project Engineer

The project engineer:

- Accepts elastomeric materials (water stops, nylon-reinforced neoprene sheet and elastomeric pads) by:
  - Obtaining and verifying the manufacturer's certification according to the specification.
  - Visually inspecting for cuts, damage and proper dimensions.
- Advises MTD of questionable materials received on the jobsite.

### 28.3 Functions of MTD

MTD assists the project engineer when requested.

### 28.4 Sampling and Testing

Sampling and testing are not required.

## Section 29. Epoxies (Other than Paint)

### 29.1 Overview

Epoxies on the MPL titled “Epoxies and Adhesives” do not require sampling for testing unless deemed necessary by the project engineer. Epoxies do not require a stamp indicating TxDOT approval.

### 29.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished epoxy is from a TxDOT-approved source on the current MPL titled “Epoxies and Adhesives.”
- Samples and sends epoxy to MTD if the material is not from an approved source.
- Samples epoxy purchased by the contractor on the open market, unless prior arrangements have been made to sample at origin.

### 29.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled “Epoxies and Adhesives.”

**NOTE:** Tested material will not bear the TxDOT monogram and test reports will not be issued unless material tested is not on the MPL.

### 29.4 Sampling and Testing

Epoxy and adhesives not on the MPL will be sampled in accordance with [Tex-734-I, “Sampling Epoxy.”](#) Sampling frequency is one sample per shipment.

### 29.5 Remarks

Allow 30 days for testing.

**CAUTION:** Epoxy materials may cause skin irritation. Avoid contact with skin, eyes or clothing. Wash material on skin or clothing immediately and thoroughly using soap and water. Flush material in eyes using plenty of water. Seek medical attention.

## Section 30. Fibers for Concrete

### 30.1 Overview

The specifications, requirements and specific test methods to determine the dosage of fibers for Classes A and B concrete are outlined in [DMS-4550, "Fibers for Concrete."](#)

### 30.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished fibers for concrete are from a TxDOT-approved source on the current MPL titled "Fibers for Class A and Class B Concrete Applications."
- Ensures the minimum dosage listed in [DMS-4550, "Fibers for Concrete,"](#) is used.

### 30.3 Functions of MTD

MTD:

- Samples, pretests and approves fibers for concrete in the laboratory.
- Maintains the MPL titled "Fibers for Class A and Class B Concrete Applications."

### 30.4 Sampling and Testing

Sampling frequency for concrete made with materials appearing on the MPL titled "Fibers for Class A and Class B Concrete Applications" must be in accordance with the frequency established in the *Guide Schedule of Sampling and Testing*.

## Section 31. Frames, Grates, Rings and Covers

### 31.1 Reference

Refer to the standard specifications for information regarding Item 471, “Frames, Grates, Rings, and Covers.”

### 31.2 Functions of the Project Engineer

The project engineer:

- Visually inspects the galvanized coating of welded steel frames and grates and the overall workmanship of these items. (See [Section 32. Galvanized Coatings.](#))
- Visually inspects frame, grate, ring and cover castings to ensure smooth surfaces that are free of cracks, blow holes or other defects.
- Obtains a completed Form 1818 (D-9-USA-1), “Material Statement,” with MTRs and certifications representing frames, grates, rings and covers. (See [Section 16. Buy America Documentation Program.](#))

**NOTE:** The Bridge Division (BRG) has approved frame, grate, ring and cover casting products that are a part of the Standard Inlet and Manhole Program. These approved products can be found on the “Approved Cast Iron Product Sheets” maintained by BRG.

### 31.3 Functions of MTD

MTD assists the project engineer when requested.

### 31.4 Sampling and Testing

Sampling and testing are not required.

## Section 32. Galvanized Coatings

### 32.1 Reference

Refer to the standard specifications for information regarding Item 445, "Galvanizing."

### 32.2 Functions of Project Engineer

The project engineer:

- Performs visual inspection of galvanized items received at the project site.
- Inspects galvanizing in accordance with [Section 32.5, "Galvanized Coating Thickness and Defects,"](#) for items not previously inspected by MTD.
- Advises MTD of questionable material received at the jobsite.

### 32.3 Functions of MTD

MTD:

- Inspects galvanized coatings on items normally inspected by MTD, before shipment to the jobsite. Approved items bear the TxDOT monogram.
- Issues structural test reports for all material inspected or tested by MTD.
- Assists the project engineer when requested.

### 32.4 Sampling and Testing

If the material is of questionable quality, the project engineer may submit samples in accordance with [Tex-708-I, "Sampling Galvanized Metal Products for Coating Weight,"](#) or may request MTD to inspect the galvanized coating in the field.

### 32.5 Galvanized Coating Thickness and Defects

Coating thickness measurements are not required if MTD inspected the material. When questionable material is found, contact MTD for instructions.

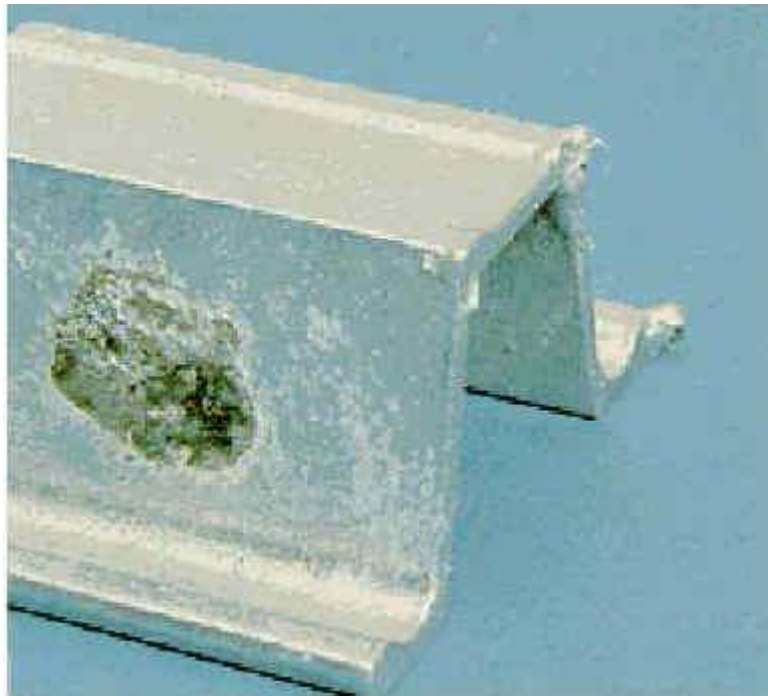
Visually inspect coating finish before installation. Use good judgment to determine acceptable coating. Different steels (e.g., chemical composition, thickness, shape and cold working) will galvanize differently. Uniform coating, therefore, is not always possible. This fact does not, however, excuse poor galvanizing procedures or handling damage. Following are some common galvanized coating defects, with the causes and corrective actions listed for each condition.

- Alligator cracking (see Figure 32-1):
  - Appearance — apparent dark lines resembling alligator skin on coating.
  - Potential cause — base metal chemical composition.
  - Action — acceptable if coating adhesion is good. (See Item 445, “Galvanizing.”)



*Figure 32-1. Alligator cracking*

- Bare (ungalvanized) area (see Figure 32-2):
  - Appearance — voids in the zinc coating that expose base metal.
  - Potential cause — insufficient pretreatment, weld slag, deposits and articles in contact during galvanizing.
  - Action — bare spots not greater than 1/8 inch are acceptable, unless numerous. Larger bare spots may be repaired. (See Item 445, “Galvanizing.”)



*Figure 32-2. Bare (ungalvanized) area*

- Heavy runs/drips (see Figure 32-3):
  - Appearance — lumps or globules.
  - Potential cause — uneven drainage, bath temperature too low and articles in contact with each other.
  - Action — acceptable unless it interferes with intended use of product. If desired, remove plainly visible excessive zinc accumulations by hand filing or other means. (See Item 445, “Galvanizing.”)



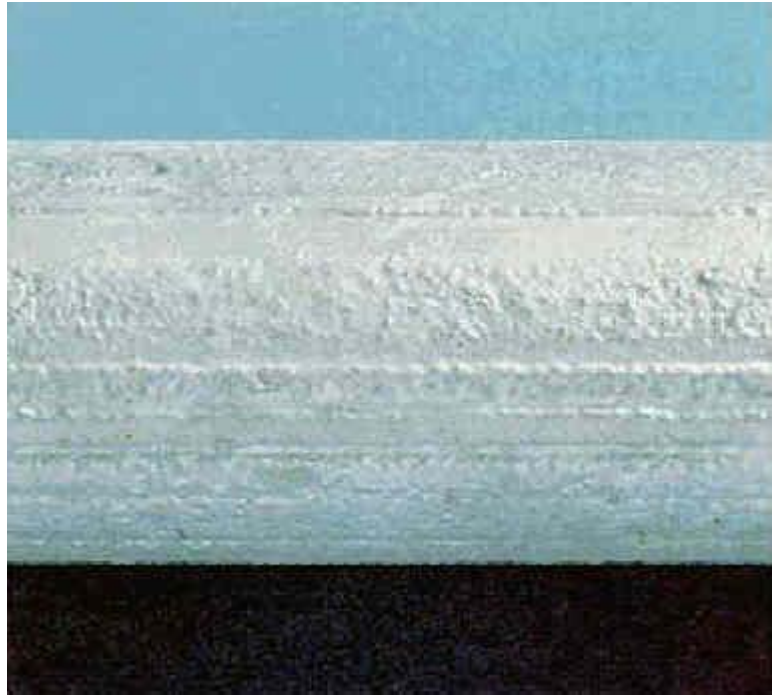
*Figure 32-3. Heavy runs/drips*

- Red rust (see Figure 32-4):
  - Appearance — red, rusty stains.
  - Potential cause — coated items in contact with rusty steel items, weeping of pickling acid from unsealed seams and joints, and presence of uncoated areas.
  - Action — remove by cleaning (power brush or grind to bare metal for small areas, then repair). Unacceptable if large or numerous. (See Item 445, “Galvanizing.”)



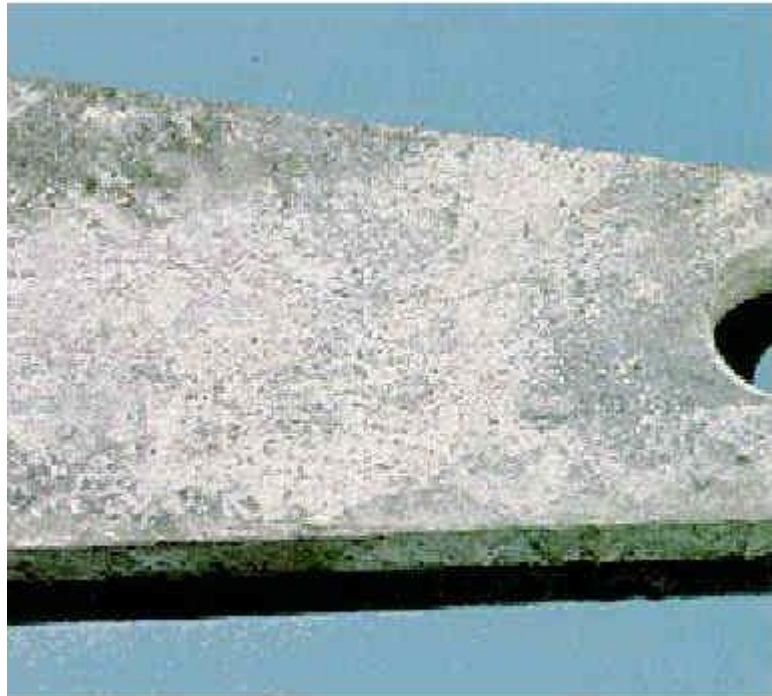
*Figure 32-4. Red rust*

- Surface roughness (see Figure 32-5):
  - Appearance — sandpaper surface appearance.
  - Potential cause — base metal chemical composition, excessive pickling and sand/shot blasting.
  - Action — acceptable if the chemistry of the steel meets specifications. Check coating for proper thickness and adhesion.



*Figure 32-5. Surface roughness*

- White rust (see Figure 32-6):
  - Appearance — white, powdery deposit.
  - Potential cause — includes conditions such as moisture presence in closely packed articles and standing water.
  - Action — remove heavy layers that cause coating to pit. Light coatings may remain. Remove any white rust from articles to be in direct contact with soil. (See Item 445, “Galvanizing.”)



*Figure 32-6. White rust*

## Section 33. Geosynthetics

### 33.1 Overview

This section addresses geosynthetics, which include, but are not limited to, filter fabric, silt fence, fabric underseal and geogrid.

Several commonly used geosynthetics appear on MPLs maintained by MTD. These materials include filter fabric, silt fence, fabric underseal and fabric joint underseal. Materials from TxDOT-approved sources on the MPLs will not require sampling for testing unless deemed necessary by the engineer.

### 33.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished filter fabric, silt fence and fabric underseal are from a TxDOT-approved source on the MPL titled "Silt Fence, Filter Fabric, and Fabric Underseal," and that fabric joint underseal is from a TxDOT-approved source on the MPL titled "Reinforced Fabric Joint Underseal."
- Samples and sends geosynthetics to MTD if the material is not on the MPLs.
- Ensures all rolls have lot or roll numbers.

### 33.3 Functions of MTD

MTD:

- Randomly tests samples to ensure quality of material.
- Maintains the MPLs titled "Silt Fence, Filter Fabric, and Fabric Underseal" and "Reinforced Fabric Joint Underseal."
- Tests samples submitted by the project engineer.

### 33.4 Sampling and Testing

For materials not appearing on an MPL, submit one sample per project in accordance with [Tex-735-I, "Sampling Geosynthetics."](#)

Allow 10 working days for testing.

## Section 34. Glass Traffic Beads

### 34.1 Overview

The specifications for this material are outlined in [DMS-8290, "Glass Traffic Beads,"](#) which includes Types II and III glass beads. This material is furnished as drop-on glass beads for Types I, II and III marking materials as stated in Item 666, "Retroreflectorized Pavement Markings."

### 34.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished traffic beads are from a TxDOT-approved source on the current MPL titled "Glass Traffic Beads."
- Verifies that the types of beads specified are used.
- Samples material of questionable quality received at the jobsite if desired.

### 34.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled "Glass Traffic Beads."
- Assists the project engineer when requested.

### 34.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. When sampling, sample one bag of beads selected randomly in accordance with [Tex-830-B, "Sampling Traffic Beads."](#)

### 34.5 Remarks

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD.

## Section 35. Ground Boxes

### 35.1 Reference

Refer to the standard specifications for information regarding Item 624, "Ground Boxes."

### 35.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished precast polymer concrete ground boxes are from manufacturers listed on the MPL titled "Roadway Illumination and Electrical Supplies," maintained by TRF.
- Advises TRF when questionable material is received at the jobsite.

### 35.3 Functions of MTD

MTD performs testing on ground boxes received from TRF or the jobsite.

### 35.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if the quality of the material is questionable. If sampling is desired, contact MTD for instructions.

## Section 36. Headwalls and Wingwalls (Precast)

### 36.1 Reference

Refer to the standard specifications for information regarding Item 466, "Headwalls and Wingwalls."

**NOTE:** Item 466, "Headwalls and Wingwalls," Section 2.2.1., "General," defines headwalls and wingwalls.

### 36.2 Functions of Project Engineer

The project engineer:

- Verifies proper marking information (manufacturer's name or trademark, type and size designation, and casting date).
- Verifies correct diameter or design (headwalls).
- Verifies correct type/wall height (wingwalls).
- Verifies concrete design strength requirements achieved before shipment.
- May reject precast headwall and wingwall units for the following:
  - Fractures or cracks passing through the wall.
  - Surface defects indicating honeycombed or open texture surfaces.
  - Improper or inadequate repairs.

### 36.3 Functions of MTD

MTD assists the project engineer when requested.

### 36.4 Sampling and Testing

Sampling and testing are not required.

## Section 37. High Mast Illumination Poles

### 37.1 Reference

Refer to the standard specifications for information regarding Item 613, “High Mast Illumination Poles.”

### 37.2 Functions of Project Engineer

The project engineer:

- Verifies that high mast illumination poles are furnished from a TxDOT-approved fabricator on the current MPL titled “High Mast Illumination Pole Fabrication Plants,” and that the fabricator’s designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator’s designated approval stamp.

- Verifies proper dimensions and general fabrication. (See [Section 7. Anchor Bolts.](#))
- Inspects for damage or defects in the galvanized coatings, such as bare spots, peeling and flaking. (See [Section 32. Galvanized Coatings.](#))
- Advises MTD of any questionable material received at the jobsite.
- Verifies that anchor bolts are lubricated and tightened, when erecting the pole, in accordance with standard specification Item 449, “Anchor Bolts.”

### 37.3 Functions of MTD

MTD:

- Provides QA inspection of high mast illumination poles at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), “Material Statement,” with MTRs and certifications for all furnished high mast illumination poles fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled “High Mast Illumination Pole Fabrication Plants.”
- Issues structural test reports for all furnished high mast illumination poles fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

### 37.4 Sampling and Testing

Sampling and testing are not required.

## Section 38. High Mast Rings and Support Assemblies

### 38.1 Reference

Refer to the standard specifications for information regarding Item 614, "High Mast Illumination Assemblies."

### 38.2 Functions of Project Engineer

The project engineer:

- Verifies that high mast rings and support assemblies are furnished from a TxDOT-approved fabricator on the current MPL titled "High Mast Rings and Support Assembly Fabrication Plants," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Verifies proper dimensions and general fabrication.
- Inspects for damage or defects in the galvanized coatings, such as bare spots, peeling and flaking. (See [Section 32. Galvanized Coatings.](#))
- Verifies proper fit, especially of items such as motors and cables, that cannot be checked in fabrication.
- Samples light fixtures for testing in accordance with [Section 38.4, "Sampling and Testing."](#)
- Verifies that high mast assembly kits and light fixtures are furnished from manufacturers listed on the current MPL titled "Roadway Illumination and Electrical Supplies" maintained by TRF.
- Advises MTD of any questionable material received at the jobsite.

### 38.3 Functions of MTD

MTD:

- Provides QA inspection on high mast rings and support assemblies at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished high mast rings and support assemblies fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "High Mast Ring and Support Assembly Fabrication Plants."
- Tests material sampled and received for testing.
- Issues structural test reports for all furnished high mast rings and support assemblies fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

## 38.4 Sampling and Testing

Sampling and testing are required for the following:

- Light fixtures — see [Tex-1110-T, "Sampling Lighting Assemblies,"](#) and contact TRF for any special instructions.
- Wire rope and terminals — see high mast illumination detail plan sheets. Fabricator provides sample directly to MTD.

Have the contractor test installed light fixtures per Item 616, "Performance Testing of Lighting Systems."

## Section 39. Hydraulic Cement and Supplementary Cementitious Materials

### 39.1 Overview

This section covers the functions of the project engineer and MTD for sampling and testing of certified sources (those appearing on the TxDOT-approved MPLs) and noncertified sources of hydraulic cement, coal ash, slag cement, silica fume and natural pozzolans. These materials are referenced in Item 421, “Hydraulic Cement Concrete.”

### 39.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished cement is from a TxDOT-approved source on the current MPL titled “Hydraulic Cement,” and that supplementary cementing materials are from TxDOT-approved sources on the current MPLs titled “Coal Ash,” [“Slag Cement,”](#) “Silica Fume” and “Natural Pozzolans.”
- Samples hydraulic cement, slag cement, silica fume and natural pozzolans at the frequency shown in the *Guide Schedule of Sampling and Testing* when noncertified materials are used on the project.
- Casts cylinders made from trial batches when silica fume is used and delivers them to MTD to verify the material is completely and uniformly dispersed in the mix.
- Samples hydraulic cement, coal ash, slag cement, silica fume and natural pozzolan when material is of questionable quality or when requested by MTD.

### 39.3 Functions of MTD

MTD:

- Samples hydraulic cement from certified and noncertified sources.
- Tests QM samples and job samples of hydraulic cement for compliance with [DMS-4600, “Hydraulic Cement.”](#)
- Tests QM samples and job samples of coal ash for compliance with [DMS-4610, “Coal Ash.”](#)
- Tests silica fume and job samples for compliance with [DMS-4630, “Silica Fume.”](#)
- Tests silica fume samples from trial batches submitted by districts to verify material dispersion in the mix.
- Maintains the MPLs titled “Hydraulic Cement,” “Slag Cement,” “Coal Ash,” [“Silica Fume”](#) and “Natural Pozzolan.”

## 39.4 Sampling

Producers submit a QM sample monthly for all certified hydraulic cement, fly ash and slag cement sources. MTD may take additional samples anytime:

- Sample hydraulic cement and slag cement in accordance with [Tex-300-D, "Sampling Hydraulic Cement."](#)
- Sample coal ash, silica fume and natural pozzolan in accordance with [Tex-733-I, "Sampling Coal Ash and Natural Pozzolans."](#)

## Section 40. Intelligent Transportation System (ITS) Poles

### 40.1 Reference

Refer to Special Specification 6011, "Intelligent Transportation System (ITS) Pole with Cabinet."

### 40.2 Functions of Project Engineer

The project engineer:

- Verifies that ITS poles are furnished from a TxDOT-approved fabricator on the current MPL titled "Intelligent Transportation System (ITS) Pole Fabrication Plants," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Verifies proper dimensions and general fabrication. (See [Section 7. Anchor Bolts.](#))
- Inspects for damage or defects in the galvanized coatings, such as bare spots, peeling and flaking. (See [Section 32. Galvanized Coatings.](#))
- Advises MTD of unacceptable material received at the jobsite.
- Verifies that anchor bolts are lubricated and tightened, when erecting the structure, per Item 449, "Anchor Bolts."

### 40.3 Functions of MTD

MTD:

- Provides QA inspection ITS poles at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished ITS poles fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Intelligent Transportation System (ITS) Pole Fabrication Plants."
- Issues structural test reports for all furnished ITS poles fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

### 40.4 Sampling and Testing

Sampling and testing are not required.

## Section 41. Joint Sealants and Fillers

### 41.1 Overview

This section addresses joint sealants and joint fillers for use in concrete pavements and bridge decks. These materials are addressed in [DMS-6310, "Joint Sealants and Fillers."](#)

### 41.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished Classes 1, 2, 3, 4, 5, 7 and 8 joint sealants are from a TxDOT-approved source on the current MPL titled ["Joint Sealers,"](#) and that the laboratory number has not expired.
- For Class 6 joint sealants (preformed seals):
  - For nominal widths less than 1.625 inches, obtains manufacturer's certification of compliance to the pertinent specifications for material acceptance.
  - For nominal widths 1.625 inches and greater, verifies that furnished material is from a TxDOT-approved source on the MPL titled ["Joint Sealers."](#)
  - For all preformed seals, visually inspects to verify size and configuration and to identify possible defects.
  - For lubricant adhesives used with all preformed seals, obtains manufacturer's certification of compliance to the pertinent specifications for material acceptance.
- Accepts all joint filler materials based on manufacturer's certification of compliance to the pertinent specifications. (See [DMS-6310, "Joint Sealants and Fillers."](#))
- For joint sealants Classes 1, 2, 3, 4, 5, 7, 8 and 6 (1.625 inches nominal width and greater) not appearing on the MPL titled ["Joint Sealers,"](#) samples and submits to MTD for testing.

### 41.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled ["Joint Sealers."](#)

### 41.4 Sampling and Testing

When sampling for testing is required or desired:

- Sample joint sealants (Classes 1, 2, 3, 4, 5, 7 and 8) and joint fillers in accordance with [Tex-500-C, "Sampling Bituminous Materials, Pre-Molded Joint Fillers, and Joint Sealers."](#)

- For Class 6 joint sealants (preformed seals), take at least one sample from each size of preformed seal. Take the sample from the seals provided with at least 3 feet extra length. Remove the extra lengths and forward to MTD for testing.

## Section 42. Junction Boxes, Manholes and Inlets (Precast)

### 42.1 Reference

Refer to the standard specifications for information regarding Item 465, "Junction Boxes, Manholes, and Inlets."

### 42.2 Functions of Project Engineer

The project engineer:

- Verifies that precast concrete junction boxes, manholes and inlets, fabricated at a multi-project fabrication plant, are furnished from a TxDOT-approved fabricator on the current MPL titled "Junction Boxes, Manholes, and Inlets Fabrication Plants (Multi-Project)," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** Item 424, "Precast Concrete Structural Members (Fabrication)," defines multi-project fabrication plants. See the MPL for each fabricator's designated approval stamp.

- Attaches SiteManager QM test report for precast concrete junction boxes, manholes and inlets furnished by TxDOT-approved multi-project plants.
- Advises MTD when items of unacceptable quality are received on the jobsite.

**NOTE:** For precast manhole and inlet steel and iron appurtenances, see [Section 31. Frames, Grates, Rings and Covers](#).

### 42.3 Functions of MTD

MTD:

- Provides QA inspection of precast concrete junction boxes, manholes and inlets fabricated at TxDOT-approved multi-project fabrication plants.
- Maintains the MPL titled "Junction Boxes, Manholes, and Inlets Fabrication Plants (Multi-Project)."
- Assists the project engineer when requested.

## Section 43. Lime and Lime Slurry

### 43.1 Overview

This section describes the sampling procedures for all types of lime: hydrated lime, quicklime and commercial lime slurry.

Lime producers are prequalified and monitored by MTD for compliance with DMS-6350, "Lime and Lime Slurry." Only producers listed on the MPL titled "Lime" will be allowed to supply lime to TxDOT projects.

**NOTE:** Shipments from non-prequalified sources must be tested and prequalified before use.

### 43.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished lime is from a TxDOT-approved source on the current MPL titled "Lime."
- Samples lime at the jobsite in accordance with [Tex-600-J, "Sampling and Testing Lime,"](#) at the frequency shown in the *Guide Schedule of Sampling and Testing*, and submits to MTD for testing.

### 43.3 Functions of MTD

MTD:

- Samples lime at origin when deemed necessary.
- Maintains the MPL titled "Lime."
- Tests quality for compliance with [DMS-6350, "Lime and Lime Slurry."](#)
- Tests samples submitted by the project engineer in accordance with [Tex-600-J, "Sampling and Testing Lime."](#)
- Issues test reports for samples submitted by the project engineer.

### 43.4 Sampling and Testing

Sampling frequency (shown in the *Guide Schedule of Sampling and Testing*):

- Hydrated lime and quicklime — producers submit a QM sample monthly for all certified hydrated lime and quicklime. MTD may take additional samples anytime.
- Commercial lime slurry — one sample per 200 tons or fraction thereof. When using 50 tons or less of commercial lime slurry, sampling is not required if lime supplied is from a prequalified source.
- Sample hydrated lime, quicklime and commercial lime slurry in accordance with [Tex-600-J, "Sampling and Testing Lime."](#)

## 43.5 Remarks

For commercial lime slurry, indicate on [Form 202, "Identification of Material Samples,"](#) the solids content specified for that project and the seal number assigned to the load.

Allow five working days for testing.

**NOTE:** Lime sample chemical properties may be altered by exposure to air and/or moisture. Use dry buckets for sampling, keep tightly closed and submit for testing without delay.

**WARNING:** Quicklime is extremely hazardous and capable of inflicting severe caustic burns to skin, lung damage, eye injury and even blindness if handled improperly. Personnel handling, sampling or testing quicklime should wear proper protective clothing, respirators, dustproof goggles and waterproof gloves to prevent injury.

## Section 44. Mechanical Couplers for Reinforcing Steel

### 44.1 Overview

The mechanical couplers for reinforcing steel specifications are outlined in [DMS-4510, "Mechanical Couplers for Reinforcing Steel."](#) DMS-4510 is referenced in Item 440, "Reinforcement for Concrete."

### 44.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished mechanical couplers for reinforcing steel are from a TxDOT-approved fabricator on the current MPL titled "[Mechanical Couplers."](#)
- Collects project samples from all TxDOT projects that use mechanical couplers in accordance with [Tex-743-I, "Sampling Mechanical Couplers."](#)
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications. (See [Section 16. Buy America Documentation Program.](#))
- Verifies the written installation instructions previously obtained from the manufacturer. These instructions must be specifically for the coupler type, model, bar size and grade in use.
- Witnesses the contractor assemble three randomly sampled mechanical couplers from each sample lot, and submits the assembled mechanical couplers to MTD for testing.

### 44.3 Functions of MTD

MTD:

- Maintains the MPL titled "Mechanical Couplers."
- Samples, pretests and approves mechanical couplers in the laboratory.
- Tests mechanical coupler samples submitted by the project engineer.

### 44.4 Sampling and Testing

Sample three mechanical couplers randomly from each sample lot as defined in [Tex-743-I, "Sampling Mechanical Couplers."](#) MTD will test in accordance with [Tex-744-I, "Testing Mechanical Couplers for Reinforcing Steel."](#)

## Section 45. Metal Beam Guard Fence

### 45.1 Reference

Refer to the standard specifications for information regarding Item 540, "Metal Beam Guard Fence."

### 45.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished metal beam guard fence material is from a TxDOT-approved source on the current MPLs titled:
  - "Timber Treating Plants and Suppliers" for timber blocks and posts.
  - "Composite Material Blocks and Posts for Metal Beam Guard Fence" for composite material blocks and posts.
  - "Metal Beam Guard Fence Rail Element Manufacturers" for rail elements.

**NOTE:** Each approved manufacturer's rail element brand description is shown on the MPL.

- Visually inspects timber posts and blocks. (See [Section 75. Treated Timber Products.](#))
- Receives Form 2148, "Certification of Compliance (Treated Timber Products)," for each shipment of timber blocks and posts. (See Item 492, "Timber Preservative and Treatment," Section 2.2., "Identification," in the standard specifications.)
- Visually inspects galvanized coating on steel items for bare spots, peeling, flaking or handling damage. (See [Section 32. Galvanized Coatings.](#))
- Attaches SiteManager QM test report for timber blocks and posts, composite material blocks and posts, and rail elements.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports for **all steel components** of metal beam guard fence. (See [Section 16. Buy America Documentation Program.](#))
- Advises MTD of any unacceptable material received at the jobsite.

### 45.3 Functions of MTD

MTD:

- Administers the inspection and testing of timber blocks and posts performed by a contract commercial agency.
- Maintains the MPLs titled "Timber Treating Plants and Suppliers," "Composite Material Blocks and Posts for Metal Beam Guard Fence" and "Metal Beam Guard Fence Rail Element Manufacturers."
- Assists the project engineer when requested.

## 45.4 Sampling and Testing

Sampling and testing are not required but may be performed if the galvanized coating on steel material is of questionable quality. Sample, if desired, in accordance with:

- [Tex-708-I, "Sampling Galvanized Metal Products for Coating Weight,"](#) for bolts and nuts.
- [Tex-713-I, "Sampling Metal Beam Guard Fence Rail Element,"](#) for rail element.

## Section 46. Multiple-Piece Tie Bars

### 46.1 Reference

Refer to [DMS-4515, "Multiple-Piece Tie Bars for Concrete Pavement,"](#) for information regarding multiple-piece tie bars for concrete pavement. DMS-4515 is referenced in Item 360, "Concrete Pavement."

### 46.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished multiple-piece tie bars are from a TxDOT-approved source on the current MPL titled "[Multiple Piece Tie Bar.](#)"
- Collects project samples from all TxDOT projects that use multi-piece tie bars for concrete pavement in accordance with [Tex-711-I, "Sampling Multiple-Piece Tie Bars for Concrete Pavement."](#)
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications. (See [Section 16. Buy America Documentation Program.](#))
- Witnesses the contractor assemble 10 randomly selected multiple-piece tie bar assemblies according to manufacturer's instructions from materials delivered to the project site.
- Submits the project samples to MTD per [Tex-701-I, "Tagging/Labeling, Documenting, and Shipping,"](#) including the documentation provided by the contractor.
- Verifies proper installation, fit and tightening of the tie bars as follows:
  - Pinging the installed tie bar — a continuous ring from the tie bar indicates a proper fit, and a thud indicates a poor fit and the need for further investigation.
  - Looking at the thread area — if more than a few of the external threads are not engaged with the internal threads, perform further investigation.
  - gripping the tie bar — if the tie bar is loose, perform further investigation.
- For multiple-piece tie bars not used because of lack of performance, verifies that replacement tie bars are drilled and epoxied into place.

**NOTE:** For epoxy-coated multiple-piece tie bars, verify that material is from a TxDOT-approved source on the current MPL titled "Epoxy Applicators for Reinforcing Steel." (See [Section 60. Reinforcing Steel.](#))

### 46.3 Functions of MTD

MTD:

- Tests material sampled by the project engineer.
- Maintains the MPL titled "Multiple-Piece Tie Bar Producers."
- Provides tie bar pull-out testing equipment when requested.

- Assists the project engineer when requested.

## **46.4 Sampling and Testing**

Sample multiple-piece tie bars in accordance with [Tex-711-I, "Sampling Multiple-Piece Tie Bars for Concrete Pavement."](#) MTD will test in accordance with [Tex-712-I, "Testing Multiple-Piece Tie Bars for Concrete Pavement."](#)

## Section 47. Multipolymer Pavement Markings

### 47.1 Overview

The specifications for this material are outlined in [DMS-8230, "Multipolymer Pavement Markings,"](#) which includes epoxy and polyurea marking materials. This material is furnished as a Type III marking material in Item 666, "Retroreflectorized Pavement Markings."

### 47.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished multipolymer pavement markings are from a TxDOT-approved source on the current MPL titled "Multipolymer Pavement Markings."
- Obtains certification from the manufacturer for multipolymer pavement markings stating that the material conforms with TxDOT specifications.
- Samples material of questionable quality received at the jobsite if desired.

### 47.3 Functions of MTD

MTD:

- Tests samples of questionable material when submitted by the project engineer.
- Maintains the MPL titled "Multipolymer Pavement Markings."
- Assists the project engineer when requested.

### 47.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample questionable materials for testing, if desired, in accordance with [Tex-736-I, "Sampling Structural Coatings."](#)

### 47.5 Remarks

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 48. Overhead Sign Supports

### 48.1 Overview

Overhead sign supports include truss-type balanced tee, bridge, cantilever and combined bridge and cantilever structures, and monotube-type bridge and cantilever structures.

### 48.2 Reference

Refer to the standard specifications for information regarding Item 650, "Overhead Sign Supports."

### 48.3 Functions of Project Engineer

The project engineer:

- Verifies that overhead sign supports are furnished from a TxDOT-approved fabricator on the current MPL titled "Overhead Sign Support Structure & Sign Walkway Fabrication Plants," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Verifies proper dimensions and general fabrication. (See [Section 7. Anchor Bolts.](#))
- Inspects for damage to members or galvanized coating. (See [Section 32. Galvanized Coatings.](#))
- Verifies that anchor bolts are properly lubricated and tightened, when erecting the structure, per Item 449, "Anchor Bolts."
- Verifies that fasteners for field-bolted connections are properly installed per Item 447, "Structural Bolting."
- Verifies proper camber of overhead sign support spans.
- Advises MTD of unacceptable material received at the jobsite.

### 48.4 Functions of MTD

MTD:

- Provides QA inspection of overhead sign supports fabricated at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished overhead sign supports fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Overhead Sign Support Structure and Sign Walkway Fabrication Plants."
- Issues structural test reports for all furnished overhead sign supports fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

## **48.5 Sampling and Testing**

Have each member of the bolting crew in the field perform an acceptable preinstallation verification test on fasteners for field-bolted connections per Item 447, "Structural Bolting," Section 4.1., "Verification Testing," of the standard specifications.

If desired, perform jobsite rotational capacity (RC) testing on fasteners for field-bolted connections per [Tex-452-A, "Rotational Capacity Testing of Fasteners Using a Tension Measuring Device."](#)

## Section 49. Paint for Structural Steel

### 49.1 Overview

The specifications for this material are outlined in [DMS-8100, "Structural Steel Paints — Formula"](#); [DMS-8101, "Structural Steel Paints — Performance"](#); and DMS-8105, "Paint, One Coat Overcoat." These departmental materials specifications (DMSs) are referenced in Item 446, "Field Cleaning and Painting Steel."

### 49.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished paint for Systems I, II, III-A, III-B and IV is from a TxDOT-approved source on the current MPL titled "Structural Steel Paints — Performance."
- Verifies that furnished paint for System I is from a TxDOT-approved source on the current MPL titled "Paint, One Coat Overcoat."
- Samples all paint, one sample per project, and submits to MTD for testing.

### 49.3 Functions of MTD

MTD:

- For structural steel paints — formula:
  - Samples and tests for QA at the origin to ensure conformance to TxDOT specifications.
  - Tests samples submitted by the project engineer.
- For structural steel paints — performance:
  - Maintains the MPL titled "Structural Steel Paints — Performance."
  - Tests samples submitted by the project engineer.
- For one-coat overcoat paints:
  - Maintains the MPL titled "Paint, One Coat Overcoat."
  - Tests samples submitted by the project engineer.
- Assists the project engineer when requested.

### 49.4 Sampling and Testing

Sample material for testing in accordance with [Tex-736-I, "Sampling Structural Coatings."](#)

### 49.5 Remarks

Structural paints must be thoroughly agitated before sampling or use. Samples must be shipped in clean friction top buckets or cans.

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of structural coating, quantity, name of manufacturer, product destination and batch number.

## Section 50. Pedestal Pole Assemblies

### 50.1 Reference

Refer to the standard specifications for information regarding Item 687, "Pedestal Pole Assemblies."

### 50.2 Functions of Project Engineer

The project engineer:

- Accepts pedestal pole assemblies from the manufacturer stating that all materials comply with Item 687, "Pedestal Pole Assemblies."
- Verifies that furnished pedestal pole bases are from TxDOT-approved manufacturers on the current MPL titled "Roadway Illumination and Electrical Supplies," maintained by TRF.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports for the steel components. (See [Section 16. Buy America Documentation Program](#).)
- Inspects for damage or defects in the galvanized coating. (See [Section 32. Galvanized Coatings](#).)
- Verifies proper dimensions and assembly.
- Advises TRF if questionable material is received on the jobsite.

### 50.3 Functions of MTD

MTD or TRF assists the project engineer when requested.

### 50.4 Sampling and Testing

Sampling and testing are not required.

# Section 51. Penetrating Concrete Surface Treatments – Silanes

## 51.1 Overview

The specifications for this material are outlined in [DMS-8140, "Penetrating Concrete Surface Treatment."](#) The material is used as specified in Item 428, "Penetrating Concrete Surface Treatment."

## 51.2 Functions of Project Engineer

The project engineer:

- Verifies that the furnished penetrating concrete surface treatment is from a TxDOT-approved source on the current MPL titled "Penetrating Concrete Surface Treatments."
- Samples penetrating concrete surface treatment, one sample per project, and submits to MTD for verification testing.
- Samples material of questionable quality received at the jobsite if desired.

## 51.3 Functions of MTD

MTD:

- Maintains the MPL titled "Penetrating Concrete Surface Treatments."
- Tests samples submitted by the project engineer.

## 51.4 Sampling and Testing

Sample material for testing in accordance with [Tex-736-I, "Sampling Structural Coatings."](#)

## 51.5 Remarks

The project engineer completes [Form 202, "Identification of Material Samples,"](#) with each material sample. Inquiries should include the type of material, quantity, name of manufacturer, product destination and batch number.

## Section 52. Precast Nonstressed Concrete

### 52.1 Overview

This section addresses precast nonstressed concrete items requiring fabrication per Item 424, "Precast Concrete Structural Members (Fabrication)." These items are to be fabricated by multi-project and project-specific fabrication plants as defined in Item 424 and [DMS-7300, "Precast Concrete Fabrication Plants."](#) The following standard specifications reference Item 424 for precast nonstressed concrete fabrication:

- Item 419, "Concrete Sound (Noise) Walls," for formed precast-related items (panels, coping, caps and columns).
- Item 423, "Retaining Walls," for formed precast items (panels and coping).
- Item 450, "Railing."

Other precast nonstressed concrete items may also require Item 424 fabrication in accordance with pertinent documents such as special specifications and plan notes. These may include precast items such as C-span culverts and bridge bent caps and columns.

### 52.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished precast nonstressed items are from a TxDOT-approved fabricator on the current MPL titled "Nonstressed Member Fabrication Plants (Multi-Project)," and that the fabricator's designated approval stamp is placed on the precast nonstressed items.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Attaches SiteManager QM test reports for precast railing, retaining walls and sound walls produced at TxDOT-approved multi-project fabrication plants.
- Inspects precast items received on the jobsite for the following:
  - Excessive cracking or other damage.
  - Proper fit and aesthetics.
  - Proper installation.
- Inspects precast items at project-specific nonstressed member fabrication plants.
- Advises MTD when items of questionable quality are received on the jobsite.

### 52.3 Functions of MTD

MTD:

- Provides QA inspection of precast items fabricated at TxDOT-approved multi-project nonstressed member fabrication plants.

- Except for precast railing, retaining walls and sound walls, issues structural test reports for all other precast nonstressed items fabricated at TxDOT-approved multi-project nonstressed member fabrication plants.
- Maintains the MPL titled "Nonstressed Member Fabrication Plants (Multi-Project)."
- Assists the project engineer when requested.

## Section 53. Prefabricated Pavement Markings (Permanent)

### 53.1 Overview

The specifications for this material are outlined in [DMS-8240, "Permanent Prefabricated Pavement Markings,"](#) which includes Types B and C pavement markings. DMS-8240 is referenced in Item 662, "Work Zone Pavement Markings," and Item 668, "Prefabricated Pavement Markings and Rumble Strips."

### 53.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished prefabricated pavement markings are from a TxDOT-approved source on the current MPL titled "Permanent Prefabricated Pavement Markings."
- Samples prefabricated pavement markings of questionable quality at the jobsite if desired.

### 53.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled "Permanent Prefabricated Pavement Markings."
- Assists the project engineer when requested.

### 53.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample questionable material for testing, if desired, per [Tex-732-I, "Sampling Prefabricated Pavement Marking Materials."](#)

## Section 54. Prefabricated Pavement Markings (Removable)

### 54.1 Overview

The specifications for this material are outlined in [DMS-8241, "Temporary \(Removable\) Prefabricated Pavement Markings."](#) DMS-8241 is referenced in Item 662, "Work Zone Pavement Markings."

### 54.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished temporary (removable) prefabricated pavement markings are from a TxDOT-approved source on the current MPL titled "Temporary (Removable) Prefabricated Pavement Markings."
- Samples temporary (removable) prefabricated pavement markings of questionable quality at the jobsite if desired.

### 54.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPL titled "Temporary (Removable) Prefabricated Pavement Markings."
- Assists the project engineer when requested.

### 54.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample questionable material for testing, if desired, in accordance with [Tex-732-I, "Sampling Prefabricated Pavement Marking Materials."](#)

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of structural coating, quantity, name of manufacturer, product destination and batch number.

## Section 55. Prestressed Concrete

### 55.1 Overview

This section addresses precast prestressed concrete items requiring fabrication per Item 424, "Precast Concrete Structural Members (Fabrication)." These items are to be fabricated by multi-project and project-specific fabrication plants as defined in Item 424 and [DMS-7300, "Precast Concrete Fabrication Plants."](#) The following standard specifications reference Item 424 for precast prestressed concrete fabrication:

- Item 409, "Prestressed Concrete Piling."
- Item 422, "Concrete Superstructures," for bridge deck panels.
- Item 425, "Precast Prestressed Concrete Structural Members," for beams/girders.

Other precast prestressed concrete items may also require Item 424 fabrication in accordance with pertinent documents such as special specifications and plan notes. These may include prestressed items such as C-span culverts, bridge bent caps and columns.

### 55.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished prestressed concrete items are from a TxDOT-approved fabricator on the current MPL titled "Prestressed Member Fabrication Plants (Multi-Project)," and that the fabricator's designated approval stamp is placed on the precast nonstressed items.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Attaches SiteManager QM test report for prestressed concrete piling produced at TxDOT-approved multi-project fabrication plants.
- Inspects prestressed items received on the jobsite for the following:
  - Damage such as cracking that exceeds the specification tolerance or spalled concrete.
  - Proper fit and location of diaphragms, dowel holes and appurtenances.
  - Proper installation.
- Inspects prestressed concrete items fabricated at project-specific prestressed member fabrication plants.
- Advises MTD when items of questionable quality are received on the jobsite.

### 55.3 Functions of MTD

MTD:

- Provides QA inspection of prestressed concrete items fabricated at TxDOT-approved multi-project prestressed member fabrication plants. These include the following prestressed concrete items:

- I-girders.
  - X-beams.
  - U-beams.
  - Box beams.
  - Slab beams.
  - Decked slab beams.
  - Tee beams.
  - Bridge deck panels.
  - Piling.
  - Bent caps.
  - Any other prestressed concrete items to be fabricated per Item 424, "Precast Concrete Structural Members (Fabrication)."
- Issues structural test reports for all prestressed concrete items fabricated at TxDOT-approved multi-project prestressed member fabrication plants, except for prestressed concrete piling.
  - Maintains the MPL titled "Prestressed Member Fabrication Plants (Multi-Project)."
  - Assists the project engineer when requested.

## Section 56. Railing (Metal)

### 56.1 Reference

Refer to the standard specifications for information regarding Item 450, "Railing."

**NOTE:** Steel W-beam elements for Types T631 and T631LS are specified under Item 540, "Metal Beam Guard Fence." (See [Section 45. Metal Beam Guard Fence](#) for W-beam rail element.)

### 56.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished metal railing is from a TxDOT-approved fabricator on the current MPL titled "Metal Railing Fabrication Plants," and that the fabricator's designated approval stamp is placed on the metal rail.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Inspects metal railing for proper dimensions, hole sizes and location, general fabrication, bare spots, peeling, flaking or handling damage to the steel-galvanized coating or paint coating. (See [Section 32. Galvanized Coatings.](#))
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports for the steel anchor bolts. (See [Section 16. Buy America Documentation Program.](#))
- Advises MTD of any metal railing posts or panels received at the jobsite that are of unacceptable quality.

### 56.3 Functions of MTD

MTD:

- Provides QA inspection of metal railing at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished metal railing fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Metal Rail Fabrication Plants."
- Issues structural test reports for all furnished metal railing fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

## 56.4 Sampling and Testing

If desired, sample questionable bolts and nuts in accordance with [Tex-708-I, "Sampling Galvanized Metal Products for Coating Weight,"](#) for galvanized coating testing. The project engineer may also sample questionable W-beam elements in accordance with [Tex-713-I, "Sampling Metal Beam Guard Fence Rail Element,"](#) for testing.

A copy of the MTRs must accompany all samples.

## Section 57. Railing (Precast)

See [Section 52. Precast Nonstressed Concrete](#).

## Section 58. Raised Pavement Markers

### 58.1 Overview

The specifications for raised pavement markers are outlined in [DMS-4200, "Pavement Markers \(Reflectorized\)";](#) [DMS-4210, "Snowplowable Pavement Markers";](#) and [DMS-4300, "Traffic Buttons."](#) These materials are specified in Item 672, "Raised Pavement Markers."

### 58.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished marker materials are from a TxDOT-approved source on the current MPLs titled ["Pavement Markers \(Reflectorized\)";](#) "Pavement Markers (All-Weather, Reflectorized, Snowplowable)"; and ["Traffic Buttons."](#)
- Samples marker material of questionable quality received at the jobsite if desired.
- Verifies that the specified marker adhesive material is furnished.

**NOTE:** The contractor may propose alternative adhesive materials for consideration and approval by the engineer as stated in Item 672, "Raised Pavement Markers."

- Verifies that furnished adhesive material is from a TxDOT-approved source on the current MPL titled "Epoxies and Adhesives" or "Bituminous Marker Adhesive."

**NOTE:** Traffic marker adhesives are designated as Type II on the MPL titled "Epoxies and Adhesives."

### 58.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPLs titled ["Pavement Markers \(Reflectorized\)";](#) "Pavement Markers (All-Weather, Reflectorized, Snowplowable)"; and ["Traffic Buttons."](#)
- Assists the project engineer when requested.

### 58.4 Sampling and Testing

Sample questionable marker materials for testing per [Tex-729-I, "Sampling Traffic Markers."](#)

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 59. Reinforced Concrete Pipe

### 59.1 Reference

Refer to the standard specifications for information regarding Item 464, "Reinforced Concrete Pipe."

### 59.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished reinforced concrete pipe (RCP) sections are from a TxDOT-approved fabricator on the current MPL titled "Reinforced Concrete Pipe and Precast Box Culvert Fabrication Plants," and that the fabricator's designated approval stamp is placed on the RCP sections.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Verifies the proper size and class or D-load.
- Inspects for damage or defects.
- Attaches SiteManager QM test reports.
- Rejects pipe sections furnished to the project for any of the following:
  - Fractures or cracks passing through the pipe shell/wall, except for a single end crack that does not extend past the depth of the joint (see Figure 59-1).
  - Defects that indicate imperfect proportioning, mixing and molding. These defects cause conditions such as delamination, misalignment or inadequate cover of reinforcing steel.
  - Surface defects indicating honeycombed or open texture, which renders pipe unacceptable for use (see Figure 59-2).
  - Damaged ends that prevent making a satisfactory joint.
  - Any continuous crack with a width of 0.01 inch or more and extending for a length of 12 inches or more, regardless of position in the wall of the pipe. These cracks do not need to pass through the shell or wall for the condition to be rejectable.
- Advises MTD when pipe sections of unacceptable quality are received on the jobsite.

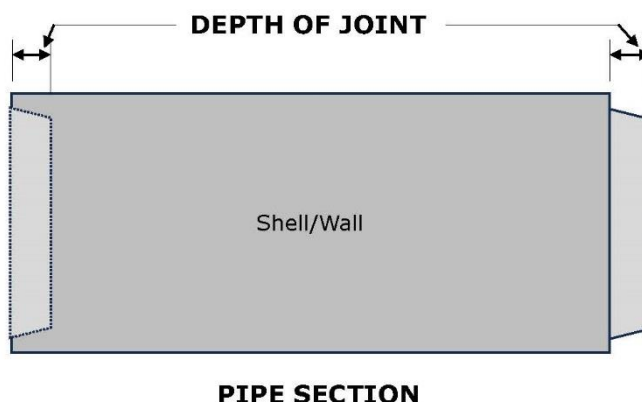


Figure 59-1. Depth of joint



Figure 59-2. Honeycombed concrete

### **59.3 Functions of MTD**

MTD:

- Provides QA inspection of RCP fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Reinforced Concrete Pipe and Precast Box Culvert Fabrication Plants."
- Assists the project engineer when requested.

### **59.4 Sampling and Testing**

Sampling and testing are not required.

## Section 60. Reinforcing Steel

### 60.1 Reference

Refer to the standard specifications for information regarding Item 440, "Reinforcement for Concrete."

### 60.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished uncoated reinforcing steel is from a TxDOT-approved producing mill on the current MPL titled "Reinforcing Steel Mills."

**NOTE:** Deformed bar identification markings for each approved bar mill can be found on the MPL.

- Verifies that furnished epoxy-coated reinforcing steel is from a TxDOT-approved epoxy applicator on the current MPL titled "Epoxy Applicators for Reinforcing Steel."
- Ensures proper size and grade of steel are used.
- Attaches SiteManager QM test reports.
- Ensures all visible damage to epoxy coating from handling or placement is properly repaired before the placement of concrete.
- Obtains MTRs for all uncoated and epoxy-coated reinforcing steel furnished to the project.

**NOTE:** Form 1818 (D-9-USA-1), "Material Statement," is **not** required to be furnished for reinforcing steel. (See [Section 16. Buy America Documentation Program](#).)

- Obtains a copy of written certification and the epoxy applicator's control tests for epoxy-coated reinforcing steel furnished to the project.
- Contacts MTD when:
  - Uncoated or epoxy-coated reinforcing steel is of questionable quality.
  - Uncoated or epoxy-coated reinforcing steel is from an unapproved producing mill or an unapproved epoxy applicator.

### 60.3 Functions of MTD

MTD:

- Maintains the MPLs titled "Reinforcing Steel Mills" and "Epoxy Applicators for Reinforcing Steel."
- Assists the project engineer when requested.

### 60.4 Sampling and Testing

Sampling at the project site for testing is not required but may be performed if material is of questionable quality. Sample uncoated reinforcing steel, when desired, in accordance with [Tex-709-I](#).

["Sampling Reinforcing Steel."](#) For epoxy-coated reinforcing steel, contact MTD for sampling instructions when sampling of this material is desired.

## Section 61. Retaining Walls (Precast)

See [Section 52. Precast Nonstressed Concrete](#).

## Section 62. Right of Way Markers

### 62.1 Overview

Right of way markers are constructed from cast-in-place concrete.

### 62.2 Reference

Refer to the standard specifications for information regarding Item 538, "Right of Way Markers."

### 62.3 Functions of Project Engineer

The project engineer:

- Inspects the construction of cast-in-place concrete right of way markers.
- Verifies the shape and dimensions for right of way markers according to the plans.

### 62.4 Functions of MTD

MTD assists the project engineer when requested.

### 62.5 Sampling and Testing

Sampling and testing are not required.

### 62.6 Remarks

When bronze disks are required by the plans, TxDOT will furnish them to the contractor at no cost.

## Section 63. Roadside Flashing Beacon Assemblies

### 63.1 Reference

Refer to the standard specifications for information regarding Item 685, "Roadside Flashing Beacon Assemblies."

### 63.2 Functions of Project Engineer

The project engineer:

- Verifies that flasher controller assemblies are from a TxDOT-approved manufacturer on the current MPL titled "Traffic Signals" maintained by TRF.
- Verifies that pedestal pole bases are from a TxDOT-approved manufacturer on the approved MPL titled "Roadway Illumination and Electrical Supplies" maintained by TRF.
- Verifies that solar-powered flasher controller assemblies, when required, are from a TxDOT-approved manufacturer on the approved MPL titled "Traffic Signals" maintained by TRF.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs, certifications and galvanizing reports for the steel components. (See [Section 16. Buy America Documentation Program](#).)
- Advises MTD or TRF if questionable material is received on the jobsite.

### 63.3 Functions of MTD

TRF assists the project engineer when requested.

### 63.4 Sampling and Testing

Sampling and testing are not required.

## Section 64. Roadside Sign Supports

### 64.1 References

Refer to the standard specifications for information regarding Item 644, "Small Roadside Sign Assemblies," and Item 647, "Large Roadside Sign Supports and Assemblies."

### 64.2 Functions of Project Engineer

The project engineer:

- Verifies that the following small roadside sign support types are furnished by TxDOT-approved manufacturers on the MPL titled "Crashworthy Small Roadside Sign Supports" maintained by TRF:
  - Wedge anchor system with thin-walled tubing post.
  - Universal anchor system with thin-walled tubing post or fiberglass-reinforced plastic post.
- Verifies that triangular slipbase system mounts (small roadside sign support type) comply with the detail drawings located on the TRF website.

**NOTE:** The slipbase component for this mount type must be furnished by a TxDOT-approved manufacturer on the MPL maintained by TRF.

- Inspects small roadside sign supports for the following:
  - Galvanized coating damage (see [Section 32. Galvanized Coatings](#)) or shipping damage (e.g., bent or twisted).
  - TxDOT monogram for bridge-mounted sign supports inspected by MTD.
  - Obtains completed Form 1818 (D-9-USA-1), "Material Statement," with attached MTRs, certifications and galvanized reports for all steel sign supports not inspected by MTD. (See [Section 16. Buy America Documentation Program.](#))
- Inspects large roadside sign supports for the following:
  - Galvanized coating damage (see [Section 32. Galvanized Coatings](#)) or shipping damage (e.g., bent or twisted).
  - TxDOT monogram for large roadside sign supports inspected by MTD.
- Advises MTD when supports appear questionable.

### 64.3 Functions of MTD

MTD:

- Obtains completed Form 1818 (D-9-USA-1), "Material Statement," with attached MTRs, certifications and galvanized reports for all inspected large roadside sign supports and bridge-mounted sign supports.
- Inspects and stamps with the TxDOT monogram all large roadside sign supports and bridge-mounted sign supports fabricated at locations where MTD performs inspection.

- Issues structural test reports for all large roadside sign supports and bridge-mounted sign supports inspected by MTD.
- Assists the project engineer when requested.

## **64.4 Sampling and Testing**

Sampling and testing are not required.

## Section 65. Roadway Illumination Assemblies

### 65.1 Reference

Refer to the standard specifications for information regarding Item 610, "Roadway Illumination Assemblies."

### 65.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished roadway illumination poles and luminaire arms are from a TxDOT-approved fabricator on the current MPL titled "Roadway Illumination Pole and Luminaire Arm Fabrication Plants," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Verifies proper dimensions and general fabrication. (See [Section 7. Anchor Bolts.](#))
- Inspects for visual defects in the welds.
- Inspects for damage or defects in the galvanized or paint coatings, such as bare spots, peeling and flaking. (See [Section 32. Galvanized Coatings.](#))
- Obtains manufacturer's certification that for transformer bases lists ASTM material specification, metal alloy and temper, and that indicates the base metal meets the physical and chemical test requirements.
- Samples light fixtures for testing according to [Section 65.4, "Sampling and Testing."](#)
- Verifies that furnished roadway illumination light fixtures and transformer bases are from manufacturers on the MPL titled "Roadway Illumination and Electrical Supplies," maintained by TRF.
- Verifies that anchor bolts (for shoe base, concrete traffic barrier base, and bridge-mounted and retaining-wall mounted poles) are lubricated and tightened, when erecting the structure, per standard specification Item 449, "Anchor Bolts."
- Verifies that transformer bases are stamped, incised or marked by other approved permanent means to show the fabricator's name or logo, and model number.
- Verifies that transformer base poles are installed per the roadway illumination detail plan sheets.
- Advises MTD of any unacceptable material received at the jobsite.

### 65.3 Functions of MTD

MTD:

- Provides QA inspection of roadway illumination poles and luminaire arms fabricated at TxDOT-approved fabrication plants.

- Obtains Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished roadway illumination poles and luminaire arms fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Roadway Illumination Pole and Luminaire Arm Fabrication Plants."
- Issues structural test reports for all furnished roadway illumination poles and luminaire arms fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

## **65.4 Sampling and Testing**

Perform sampling and testing for light fixtures, if required, in accordance with Tex-1110-T, "Sampling Lighting Assemblies." Contact TRF for any special instructions. Have the contractor test installed roadway illumination assemblies per Item 616, "Performance Testing of Lighting Systems."

## Section 66. Roadway Marker Tabs (Temporary, Flexible)

### 66.1 Overview

The specifications for this material are outlined in DMS-8242, "Temporary Flexible, Reflective Roadway Marker Tabs." DMS-8242 is referenced in Item 662, "Work Zone Pavement Markings."

### 66.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished temporary flexible reflective roadway marker tabs designated for use are from a TxDOT-approved material source on the MPL titled "Temporary Flexible, Reflective Roadway Marker Tabs."
- Samples material of questionable quality at the jobsite if desired.

### 66.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Samples and tests for QA temporary flexible reflective roadway marker tabs at the origin to ensure conformance to TxDOT specifications.
- Maintains the MPL titled "Temporary Flexible, Reflective Roadway Marker Tabs."
- Assists the project engineer when requested.

### 66.4 Sampling and Testing

Sample questionable material for testing, if desired, in accordance with [Tex-729-I, "Sampling Traffic Markers."](#)

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the type of material, quantity, name of manufacturer and batch number.

## Section 67. Safety End Treatments (Precast)

### 67.1 Reference

Refer to the standard specifications for information regarding Item 467, "Safety End Treatment."

### 67.2 Functions of Project Engineer

The project engineer:

- Verifies the following:
  - Proper marking information (manufacturer's name or trademark, type and size designation, and casting date).
  - Correct diameter, slope or bevel.
  - Concrete design strength requirements.
- May reject precast safety end treatment (SET) units for the following:
  - Improper optional headwall height. Headwall projections above pipe SET slopes that are greater than allowed on the plans increase the hazard to errant vehicles.
  - Broken ends that prevent proper jointing.
  - Fractures or cracks passing through the wall.
  - Surface defects indicating honeycombed or open texture surfaces.
  - Improper jointing (out of round pipe).
  - Improper/inadequate repairs.
- Inspects the components for SETs (pipe runners, plates and angles, and bolts and nuts) for proper sizes, dimensions, coating quality and acceptability. (See [Section 32. Galvanized Coatings](#) for information regarding galvanized steel.)
- Obtains completed Form 1818 (D-9-USA-1), "Material Statement," with attached MTRs, certifications and galvanizing reports for the SET steel components. (See [Section 16. Buy America Documentation Program.](#))

### 67.3 Functions of MTD

MTD assists the project engineer when requested.

### 67.4 Sampling and Testing

Sampling and testing are not required.

## Section 68. Sign Walkways

### 68.1 Overview

Sign walkways are installed on overhead sign supports for access to dynamic message signs.

### 68.2 Reference

Refer to the standard specifications for information regarding Item 654, "Sign Walkways."

### 68.3 Functions of Project Engineer

The project engineer:

- Verifies that furnished sign walkways are from a TxDOT-approved fabricator on the current MPL titled "Overhead Sign Support Structure and Sign Walkway Fabrication Plants," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Inspects for shipping damage to galvanized coating. (See [Section 32. Galvanized Coatings.](#))
- Inspects for proper assembly.
- Advises MTD of any unacceptable materials received at the jobsite.

### 68.4 Functions of MTD

MTD:

- Provides QA inspection of sign walkways fabricated at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished sign walkway fabrication at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Overhead Sign Support Structure and Sign Walkway Fabrication Plants."
- Issues structural test reports for all furnished sign walkways fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

### 68.5 Sampling and Testing

Sampling and testing are not required.

## Section 69. Signs

### 69.1 Reference

Refer to the standard specifications for information regarding Item 636, "Signs."

### 69.2 Functions of Project Engineer

The project engineer:

- Inspects signs for the following:
  - Proper completion of the sign identification decals required on the back-side lower lefthand corner of each sign. (See Item 636, "Signs," Section 3.1., "Decals.")
  - Shipping or handling damage. (See Item 636, "Signs," Section 3.2., "Storage and Handling," of the standard specifications for sign damage criteria.)
  - Proper storage. (See Item 636, "Signs," Section 3.2., "Storage and Handling," of the standard specifications for proper sign storage.)
  - Uniform color, appearance and retroreflectivity of sign legend, symbols, borders and background when viewed day and night.
  - Proper assembly.

**NOTE:** See the [Sign Inspection Guidance Document](#). This document provides more information regarding sign inspection and documentation mentioned above.

- Advises MTD of questionable signs received at the jobsite.
- Obtains the following documentation for all furnished signs on a project:
  - A copy of a completed Form 2273, "Signing Material Statement," from the fabricator with proper attachments (e.g., sign component material certifications).
  - A copy of notarized certification from the fabricator stating that the signs were fabricated per the plans and specifications.

### 69.3 Functions of MTD

MTD:

- Tests sign face materials for QA from the source to ensure conformance to [DMS-8300, "Sign Face Materials."](#)
- Maintains the MPL titled "Sign Face Materials."
- Assists the project manager when requested.

### 69.4 Sampling and Testing

Sampling and testing are not required at the jobsite unless a problem is identified.

## 69.5 Remarks

Fabricated construction signs are no longer inspected by MTD. The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all signs sampled, if desired, for submission to MTD.

## **Section 70. Concrete Sound or Noise Walls (Precast)**

See [Section 52. Precast Nonstressed Concrete](#) for precast sound/noise walls that are not pretensioned or post-tensioned.

## Section 71. Structural Steel Bridge Members

### 71.1 References

Refer to the standard specifications for information regarding the following:

- Item 441, "Steel Structures"
- Item 442, "Metal for Structures"
- Item 446, "Field Cleaning and Painting Steel"
- Item 447, "Structural Bolting"
- Item 448, "Steel Field Welding"

### 71.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished structural steel is from a TxDOT-approved fabricator on the current MPL titled "Steel Bridge Fabrication Shops," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Inspects structural-steel rolled beams, welded I-section plate girders, box girders, tub girders, bent caps and diaphragms for the following:
  - Damage, such as dents, bends or twists, and missing studs.
  - Damage to or deterioration of the paint.
  - Markings that would affect uniform weathering on weathering steel.
  - Match marks, according to erection plans, for bolted connections.
  - Proper fit during and after erection.
- Verifies that field painting is properly performed per Item 446, "Field Cleaning and Painting Steel."
- Verifies that fasteners for field-bolted connections are properly installed per Item 447, "Structural Bolting."
- Verifies that welding for field-welded connections is properly performed per Item 448, "Structural Field Welding."

**NOTE:** TxDOT BRG, Field Operations Section, provides technical support for field welding, cleaning and painting inspection of structural steel bridges.

- Advises MTD of unacceptable material received at the jobsite.

### 71.3 Functions of MTD

MTD:

- Provides QA inspection of structural steel bridge members fabricated at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished structural steel bridge members fabricated at TxDOT-approved fabrication plants.
- Issues structural test reports for all furnished structural steel bridge members fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Steel Bridge Fabrication Shops."
- Assists the project engineer when requested.

## **71.4 Sampling and Testing**

Have each member of the bolting crew in the field perform an acceptable preinstallation verification test on fasteners for field-bolted connections per Item 447, "Structural Bolting," Section 4.1., "Verification Testing," of the standard specifications.

If desired, perform jobsite RC testing on fasteners for field-bolted connections per [Tex-452-A, "Rotational Capacity Testing of Fasteners Using a Tension Measuring Device."](#)

## Section 72. Thermoplastic Pavement Markings

### 72.1 Overview

The specifications for this material are outlined in [DMS-8220, "Hot Applied Thermoplastic."](#) This material is used as a Type I marking material as stated in Item 666, "Retroreflectorized Pavement Markings."

### 72.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished thermoplastic pavement marking material is from a TxDOT-approved source on the current MPL titled "Thermoplastic Pavement Marking Materials."
- Verifies that furnished traffic beads are from a TxDOT-approved source on the current MPL titled "Glass Traffic Beads." (See [Section 34. Glass Traffic Beads.](#))
- Verifies that the types of glass beads specified are used and applied in the specified sequence.
- Samples material of questionable quality received at the jobsite if desired.

### 72.3 Functions of MTD

MTD:

- Tests samples submitted by the project engineer.
- Maintains the MPLs titled "Thermoplastic Pavement Marking Materials" and "Glass Traffic Beads."
- Assists the project engineer when requested.

### 72.4 Sampling

Sample material for testing, if desired, in accordance with [Tex-862-B, "Sampling Thermoplastic Pavement Marking Material."](#)

### 72.5 Remarks

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the quantity, name of manufacturer, product destination and batch number.

## Section 73. Traffic Paint

### 73.1 Overview

The specifications for this material are outlined in [DMS-8200, "Traffic Paint."](#) This material is used as a Type II marking material as stated in Item 666, "Retroreflectorized Pavement Markings."

### 73.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished traffic paint is from a TxDOT-approved source on the current MPL titled "Traffic Paint."
- Verifies that furnished traffic beads are from a TxDOT-approved source on the current MPL titled "Glass Traffic Beads." (See [Section 34. Glass Traffic Beads.](#))
- Verifies that the types of glass beads specified are used and applied in the specified sequence.
- Samples material of questionable quality received at the jobsite if desired.

### 73.3 Functions of MTD

MTD:

- Tests samples of questionable material when submitted by the project engineer.
- Samples and tests traffic paint at origin or jobsite for QA and maintains the MPLs titled "Traffic Paint" and "Glass Traffic Beads."
- Assists the project engineer when requested.

### 73.4 Sampling and Testing

Sample questionable material for testing, if desired, in accordance with [Tex-736-I, "Sampling Structural Coatings."](#)

### 73.5 Remarks

The project engineer completes [Form 202, "Identification of Material Samples,"](#) for all samples submitted to MTD. Inquiries should include the quantity, name of manufacturer, product destination and batch number.

## Section 74. Traffic Signal Pole Assemblies (Steel)

### 74.1 Reference

Refer to the standard specifications for information regarding Item 686, "Traffic Signal Pole Assemblies."

### 74.2 Functions of Project Engineer

The project engineer:

- Verifies that furnished traffic signal poles, mast arms and luminaire arms are from a TxDOT-approved fabricator on the current MPL titled "Traffic Signal Pole Assembly Fabrication Plants," and that the fabricator's designated approval stamp is placed on the material.

**NOTE:** See the MPL for each fabricator's designated approval stamp.

- Verifies proper dimensions and general fabrication. (See [Section 7. Anchor Bolts.](#))
- Inspects for visual defects in the welds.
- Inspects for damage or defects in the galvanized or paint coatings, such as bare spots, peeling and flaking. (See [Section 32. Galvanized Coatings.](#))
- Advises MTD of any unacceptable material received at the jobsite.
- Verifies that anchor bolts are lubricated and tightened, when erecting the structure, per standard specification Item 449, "Anchor Bolts."
- Visually inspects traffic signal pole mast arms, after installation with signal heads attached, for vertical vibration at arm tip that might require damping devices.

**NOTE:** See "VIBRATION WARNING" section of the single mast arm assembly and dual mast arm assembly traffic signal support structures plan sheets.

### 74.3 Functions of MTD

MTD:

- Provides QA inspection of traffic signal poles, mast arms and luminaire arms fabricated at TxDOT-approved fabrication plants.
- Obtains a completed Form 1818 (D-9-USA-1), "Material Statement," with MTRs and certifications for all furnished traffic signal poles, mast arms and luminaire arms fabricated at TxDOT-approved fabrication plants.
- Maintains the MPL titled "Traffic Signal Pole Assembly Fabrication Plants."
- Issues structural test reports for all furnished traffic signal poles, mast arms and luminaire arms fabricated at TxDOT-approved fabrication plants.
- Assists the project engineer when requested.

## **74.4 Sampling and Testing**

Sampling and testing are not required.

## Section 75. Treated Timber Products

### 75.1 Functions of Project Engineer

#### ***Treated Timber Poles for Electrical Services***

Project engineer performs inspection to verify compliance with Item 627, "Treated Timber Poles," which includes verification of the following:

- Receipt of treatment certification indicating the preservative treatment type and proving that the treatment values shown meet the required minimum net retention of preservative stated in Item 627, "Treated Timber Poles," Table 1, "AWPA Commodity Specification and Use Category for Poles."
- Compliance of the dimensional and quality requirements of the poles.
- Proper marking of the poles per Item 627, "Treated Timber Poles," Table 2, "Timber Pole Markings."

#### ***Treated Piling, Lumber, Wire Fence Posts and Metal Beam Guard Fence (MBGF) Posts and Blocks***

All treated piling, lumber, wire fence posts and MBGF posts and blocks proposed for TxDOT use must be inspected at the treating plant by a commercial inspection agency authorized by MTD. The project engineer verifies the following:

- All furnished material is from a TxDOT-approved treating plant or supplier on the current MPL titled "Timber Treating Plants and Suppliers." The project manager attaches the SiteManager QM test report.
- A completed Form 2148, "Certification of Compliance (Treated Timber Products)," is received for each shipment. (See Item 492, "Timber Preservative and Treatment," Section 2.2., "Identification," in the standard specifications.)
- Shipping invoice is received for each shipment.
- The material complies with dimensional and quality requirements.
- Advises MTD of any unacceptable treated timber products received at the jobsite.

#### ***Treated Glued Laminated Timber (for Timber Bridge Decks)***

The project engineer verifies:

- Compliance of the material dimensional and quality requirements.
- Placement of a legible American Institute of Timber Construction quality-inspected mark or an APA—The Engineered Wood Association trademark on each glued laminated timber panel.
- Receipt of a completed Form 2148, "Certification of Compliance (Treated Timber Products)," for each shipment. (See Special Specification "Pressure Treated Timber Bridge Deck [Glulam].")
- Advises MTD of any unacceptable glued laminated timber panels received at the jobsite.

## **75.2 Functions of MTD**

MTD:

- Administers the inspection services performed by a contracted commercial agency for the following treated timber products:
  - Posts (for MBGF and wire fence).
  - Blocks (for MBGF).
  - Lumber.
  - Piling.
- Maintains the MPL titled “Timber Treating Plants and Suppliers.”

## **75.3 Sampling and Testing**

Sampling and testing are not required.

## **75.4 Remarks**

Untreated lumber is accepted based on visual inspection by the project engineer or his or her designee.

## Section 76. Water

### 76.1 Reference

Refer to the standard specifications for information regarding Item 421, "Hydraulic Cement Concrete."

### 76.2 Functions of Project Engineer

The project engineer:

- For concrete mixing and curing water furnished from sources not approved by the Department of State Health Services, verifies receipt of test reports from the contractor showing compliance with Item 421, "Hydraulic Cement Concrete," Table 1, "Chemical Limits for Mix Water," before use.

**NOTE:** Water from municipal suppliers approved by the Department of State Health Services does not require testing.

- For concrete mix water that is a blend of concrete wash water and other acceptable water sources:
  - Verifies testing by the contractor of the blended wash water for compliance with Item 421, "Hydraulic Cement Concrete," Table 1, "Chemical Limits for Mix Water," and Table 2, "Acceptance Criteria for Questionable Water Supplies."
  - Verifies that testing of blended wash water by the contractor is performed at the frequency stated in Item 421, "Hydraulic Cement Concrete," Section 2.5., "Water," of the standard specifications.
- Samples water and blended wash water of questionable quality used at the jobsite if desired.

### 76.3 Functions of MTD

MTD tests samples of water submitted by the project engineer and issues test reports.

### 76.4 Sampling and Testing

- Sample water for testing, if desired, per [Tex-702-I, "Sampling Water for Use in Batching and Curing Concrete."](#)
- Sample water for testing if it is possibly contaminated or has high sulfate and/or chloride content levels when using for soil lime or cement treatment.

### 76.5 Remarks

Allow 3 days for testing.