
DMS-7350

Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Traffic Barrier



Effective Date: May 2016

1. DESCRIPTION

This Specification governs the qualification of multi-project fabrication plants **and project-specific fabrication plants located at an offsite location** (as defined in Item 424, "Precast Concrete Structures [Fabrication]") that produce precast concrete traffic barrier per Item 512, "Portable Concrete Traffic Barrier," and Item 514, "Permanent Concrete Traffic Barrier" of the Department's *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges*. In all cases, except where specifically modified herein, products must conform to Item 512 or Item 514.

NOTE: Self-Consolidating Concrete (SCC) is not allowed for project-specific fabrication plants.

2. MATERIAL PRODUCER LIST

The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of multi-project fabrication plants conforming to the requirements of this Specification. Precast concrete traffic barrier produced by fabricators appearing on the MPL, entitled "[Concrete Traffic Barrier Fabrication Plants \(Multi-Project\)](#)," require no further Department inspection and testing unless deemed necessary by the Department project engineer or CST/M&P.

When using precast barrier produced by multi-project fabrication plants, the plant must be listed on the MPL in order to provide product for Department projects. When the Contractor is to furnish and retain temporary barrier, the Contractor may provide barrier from non-approved sources or previously used barrier with written certification. (See Item 512.)

3. BIDDERS' AND SUPPLIERS' REQUIREMENTS

Use of pre-qualified product does not relieve the Contractor of the responsibility to provide product that meets this Specification. The Department may inspect or test material at any time and reject any material that does not meet the specifications.

4. PRE-QUALIFICATION PROCEDURE

4.1. **Pre-Qualification Request.** Submit a request for evaluation **under DMS-7350 to DMS_Prequal@txdot.gov.**

Include the following information, in PDF format:

- company and fabrication plant name;
- physical and mailing addresses;
- contact names, titles, phone numbers, and email addresses;
- list of precast concrete barrier types to be evaluated for qualification purposes;
- **list of welding shops that produce the supplied welded steel components for precast barriers;**
- written plant quality control and production procedures as required by Article 7350.5.; and

- list of all on-site Quality Control (QC) personnel with copies of current QC certification(s) and a detailed description of their QC-related experience (minimum 1 year), as required by Article 7350.8.

4.2. **Evaluation.** CST/M&P will review the qualification request documentation. If the qualification request includes the required information, CST/M&P will perform an initial Department-directed plant audit to ensure compliance with this Specification. The Department will evaluate fabrication plants for adequate equipment, processes, organization, experience, knowledge, and competent personnel to produce acceptable product.

4.2.1. **Qualification.** If the required submittals and audit(s) verify compliance with this Specification, the Department will list the fabrication plant on the MPL. CST/M&P reserves the right to perform additional audits (announced or unannounced) at its discretion for the plant to remain on the MPL as an approved fabrication plant of precast concrete traffic barrier. Discrepancies identified in the audit must be adequately addressed in a manner acceptable to the Department prior to being placed on the MPL.

Fabrication plants must continue successful completion of any additional Department-directed plant audits and any follow-up plant audits by adequately implementing corrective actions for all deficiencies acceptable to the Department in order to maintain approval status. Fabrication plants must also promptly perform the following in order to maintain approval status.

- Prior to making changes, submit an updated QC personnel list and copy of the most recent PCI and ACI certifications for approved on-site QC personnel when changes occur.
- Maintain the laboratory, equipment, and batch plant so it will continue to function properly for the intended use.
- Submit a request for approval of changes to QC and production procedures and concrete mix designs prior to use. Include date of revision and highlighted changes on appropriate submittals.

Failure to promptly comply with the above may result in disqualification, which includes removal from the MPL.

4.2.2. **Failure.** Fabrication plants not qualified under this Specification may not furnish precast concrete traffic barrier for use on Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

4.3. **Random Inspection and Testing.** The Department reserves the right to inspect, sample, test, conduct random audits of plants, and perform random audits of paperwork, test reports, and shipping records at any time to ensure compliance with Item 512, Item 514, Item 9.6., "Payments for Materials on Hand (MOH), and this Specification. Provide facilities and access to allow for inspection of materials, the process of fabrication, and the finished precast concrete traffic barriers.

4.4. **Disqualification.** Any fabricator that fails to comply with the requirements of this Specification is subject to disqualification, which includes removal from the MPL. A disqualified fabricator is prohibited from furnishing product to Department projects and may not bid any work let during the disqualification period. The disqualification period will be a minimum of 30 days or as determined by CST/M&P.

Causes for disqualification and removal from the MPL may include, but are not limited to:

- repetitive poor quality and workmanship,
- falsification of or incomplete documentation,
- lack of certified or qualified QC personnel,
- not following approved QC and production procedures, or
- certifying or furnishing product that does not meet the specifications.

If a fabricator has been disqualified, all previously produced products will be subject to review and possible removal from assigned projects. If the Department disqualifies a fabricator, the Department may permit subcontracting pending product qualities for active projects to another Department-approved fabrication plant for the specific product.

Before issuing a letter removing a fabricator from the MPL, a fabricator may request an issue escalation; however, the Department reserves the right to immediately remove from the MPL or suspend acceptance of product from a supplier in order to protect the public and the Department from further harm. Timely corrective action by the fabrication plant suspends the MPL removal action and the need for escalation. If needed, the Department will notify Contractors of an impending MPL removal action, through the authority of the Contract.

4.5. **Re-Qualification.** Once the disqualification period established by CST/M&P has elapsed, the fabricator may begin the re-qualification process by providing the Department with an implemented reconciliation plan that includes, at minimum:

- evidence of corrected deficiencies and corrective measures to prevent recurrences,
- passing an additional Department-directed audit, and
- ensuring compliance with all requirements of this Specification.

The disqualified fabricator will bear all costs associated with re-qualification.

4.6. **Inactive Fabricator.** If a fabricator does not furnish any precast concrete traffic barrier to Department projects for a period of 2 years, CST/M&P may remove the fabricator from the MPL due to inactivity.

CST/M&P will consider future qualification after the producer is awarded a Contract to furnish precast barrier to a Department project and is in compliance with this Specification.

5. QUALITY CONTROL AND PRODUCTION PROCEDURES

Maintain and electronically submit for approval QC and production procedures that include the following, at minimum, to ensure product compliance with Department specifications:

- maintaining and cleaning forms;
- sampling aggregates for free moisture/absorption testing (When electronic moisture probes are used, the sample acquired must be representative of the material located where electronic probes are registering moisture readings);
- storing reinforcing steel (reference Item 440.3.3., "Storage");
- verifying that correct reinforcing steel cages are constructed and provided in each unit (reference Item 440.3., "Construction");
- properly positioning reinforcing steel during casting (reference Item 440.3.5., "Placing");
- work plan, trial batch, and pilot test data for proposed concrete mix designs per Tex-703-I. Concrete mix designs must meet the applicable requirements of Item 421;
- completing Department Form PC-7 "Precast Concrete Worksheet" for each type of precast barrier cast (must include at a minimum the concrete mix design used, units that were cast, concrete slumps, air temperature, concrete placement temperature, compressive strength test results);
- concrete mixing and delivering (reference Item 421.4.6., "Mixing and Delivering Concrete");
- placing and consolidation procedures for concrete (reference Item 420.4.7., "Placing Concrete");
- placing and consolidation procedures for self-consolidating concrete in accordance with Item 424.4.2.5., "Placing Concrete";
- maintaining concrete placing temperature within specified limits (reference Item 420.4.7.1., "Placing Temperature");
- finishing unformed concrete surfaces (reference Item 512.3., "Construction");
- protecting concrete from inclement weather during placement (reference Item 420.4.7., "Placing Concrete");
- removing units from forms to prevent damage;
- concrete curing (reference Item 424, "Precast Concrete Structures [Fabrication]") and internal concrete temperature probe locations;

- storage of precast barrier to prevent damage (reference Item 512.3., “Construction”);
- reviewing and repairing damaged units in accordance with the Department’s *Concrete Repair Manual* (Units with structural damage such as major spalling, honeycombing, or significant cracking, as defined in Department Inspection Bulletin PC-7, may not be repaired);
- finished product and dimensional inspection to ensure compliance with contract plans, approved shop drawings (if applicable), and standard drawings (reference Table 1, “Precast Barrier Tolerances” of Items 512 and Item 514);
- minimizing repetitive fabrication issues or damage to units (such as concrete grout leakage, honeycombing, and spalling);
- marking each unit (must include at least the cast date; casting identification number; county; and Control, Section, Job [CSJ] number);
- marking completed and approved precast barrier by placing fabricator’s monogram stamp on each member (The monogram stamp must be Department-approved and listed on the MPL prior to being used.) This marking must not be placed on precast products until all specification requirements have been met;
- identifying and marking unacceptable units;
- verifying product is marked with fabricator’s monogram stamp, is properly identified, and is not damaged or need of repair at time of shipping;
- inspection of steel components and verification of concrete materials prior to use; and
- tracking approved and unacceptable cast products (Department inventory).

6. DOCUMENTATION

At a minimum, maintain the following documentation and make available to the Department, submitting electronically when requested:

- appropriate special provisions and general notes (project specific or statewide) and approved shop drawings (when required), or project-specific contract plans (retain until final acceptance of project);
- certifications and shipping invoices for concrete components materials (documentation must have the pertinent material information as listed on the MPL, minimum 1-year retention);
- certifications and shipping invoices for repair materials for each lot number (documentation must have the pertinent material information as listed on the Department’s MPL, minimum 1-year retention);
- mill test reports and shipping invoices received for reinforcing steel (minimum 1-year retention);
- mill test reports, certifications, and a completed notarized [Department Form 1818 \(D-9-USA-1\)](#), “Material Statement,” for steel components (reference Item 6.1.1., “Buy America”) These documents must be traceable to each project furnished with this material. Department Form 1818 (D-9-USA-1) is only required for steel and iron items (minimum 1-year retention);
- galvanizing certifications for galvanized steel items (reference Item 445, “Galvanizing,” and Item 6.1.1. These documents must be traceable to each project furnished with this material (minimum 1-year retention);
- aggregate test results for material sampled at the fabrication plant or ready mix plant (minimum 1-year retention);
- completed Department Form PC-7 “Precast Concrete Worksheet” for each type of precast barrier cast (retain until final acceptance of project);
- records of internal concrete temperature per casting lot (reference Item 424.4.2.7., Table 2, minimum 1-year retention);
- current concrete mix designs and accompanying trial batch and pilot test data using Department Form PC-342-R or other if approved (retain 7-years);
- records of approved and unacceptable products (Department inventory, retain until final acceptance of project);

- current National Ready Mix Concrete Association (NRMCA) certification or a current inspection report signed and sealed by a licensed professional engineer showing that concrete measuring, mixing, and delivery equipment meets requirements of ASTM C-94 (reference Item 421.3.1., “Concrete Plants and Mixing Equipment,” retain until superseded);
- current calibration records for concrete plant scales (reference Item 421.31.1, “Scales,” retain until superseded);
- [Department Form 596, “Concrete Batch Ticket,”](#) or equivalent (minimum 3-month retention);
- current inspection report for truck mixers and agitators, when used (reference Item 421.3.1.3., “Agitators and Truck and Stationary Mixers,” retain until superseded);
- current calibration records for compression testing machines and other equipment (retain until superseded);
- current list of the welding shops producing the supplied welded steel components for precast barriers (Notify CST/M&P when supplier changes occur.) These welding shops must maintain approved welding personnel certifications and approved welding procedure specification (WPSs) (retain until superseded); and
- current list of certified QC personnel including copies of their certifications as required in Article 7350.8. of this Specification. (Contact CST/M&P immediately when QC personnel changes occur.)

7. CERTIFICATION OF PRODUCT

QC personnel must, at a minimum, within 14 days of the product cast date:

- track product deficiencies on the Department-supplied spreadsheet, certifying that the repairs and corrective measures were performed and inspected properly by initialing the spreadsheet and placing monogram stamp on the repair;
- verify product conformance with the shop drawings and all Contract requirements (including written certification);
- sign Department Form PC-7 certifying material, inspections, documentation, repairs (if applicable), and final product acceptance were properly performed and inspected;
- mark completed and approved precast concrete products by placing fabricator’s monogram stamp including a protective clear coating over the stamp on each member, unless the member is submitted on NCR or has not attained the required design strength. NCRs must be received within 14 days of the cast date. If product on NCR is accepted, repair and mark within 14 days of approval. The monogram stamp must be Department-approved prior to use. Approved fabricator monogram stamps will be listed on the MPL; and
- mark unacceptable precast concrete products with a permanent mark, acceptable to the Engineer, near the product identification marks, or remove all project information including county, project number, and CSJ. If the Engineer has approved the marking of product with a fabricator job number instead of the required project information, also remove the fabricator job number.

8. QUALITY CONTROL PERSONNEL AND TESTING

Provide an adequate number of qualified personnel to perform all required inspection and the testing in Table 1. QC personnel must be on site and independent of production personnel, as determined by the Engineer. QC personnel must be proficient in utilizing the applicable specifications and test methods and in verifying compliance with the QC and production procedures listed in Article 7350.5. QC personnel must have current certifications as shown below. Personnel performing these duties must have a minimum of 1 year QC-related experience and are subject to Department approval.

- 8.1. **Quality Control Supervisor (On Site).** QC Supervisors must be on site working primarily in the production areas directly overseeing the QC technicians and performing routine inspection during production operations. QC Supervisors must have the authority and management’s support to make general inspection-related decisions. QC Supervisor must have:

- current PCI Level I Quality Control Technician, or ACI – Concrete Construction Special Inspector, or NPCA Production and Quality School Level I certified (recertification required every 5 years);
- current ACI Concrete Field Testing Technician – Grade I;
- current ACI Aggregate Testing Technician – Level 1; and
- current ACI Concrete Strength Testing Technician.

8.2. **Quality Control Technicians (On Site).** Quality Control Technicians must have:

- current PCI Level I Quality Control Technician, or ACI – Concrete Construction Special Inspector, or NPCA Production and Quality School Level I certified (recertification required every 5 years);
- current ACI Concrete Field Testing Technician – Grade I;
- current ACI Aggregate Testing Technician Level 1, for QC personnel performing aggregate testing per Table 1; and
- current ACI Concrete Strength Testing Technician, for QC personnel performing Tex-418-A (ASTM C 39,) “Compressive Strength of Cylindrical Concrete Specimens.”

The plant may use commercial laboratory personnel or facilities to perform the testing in Table 1 provided they meet the following requirements.

- Technicians must possess the following:
 - ACI Concrete Strength Testing Technician certification, for QC personnel performing concrete compressive strength testing; and
 - ACI Aggregate Testing Technician Level 1 certification, for personnel performing aggregate testing per Table 1.
- For testing performed at the commercial lab, the lab must be AASHTO-accredited in the specific test(s) to be conducted.

9. PLANT LABORATORY EQUIPMENT

Laboratory equipment must comply with applicable sections of Tex-237-F and Tex-498-A and is subject to Department approval. Calibrate all equipment and house it on site in a weatherproof enclosure. Recalibrate equipment at the Contractor’s expense per Tex-498-A and as follows:

- as required by the manufacturer, or
- when suspect results, malfunction, repair work occurs, or
- as directed by the Engineer.

**Table 1
Contractor Minimum Materials QC Sampling and Testing Frequencies**

Material	Test Method	Frequency
Fine Aggregate	Sieve Analysis ¹ per Tex-401-A	1 per 2,000 cu. yd. of concrete production, minimum 1 per wk. per source ²
	Fineness Modulus ¹ per Tex-402-A	
	Sand Equivalent ^{1, 9} per Tex-203-F	
	Specific Gravity and Absorption ^{1 or 11} per Tex-403-A	1 per 6 mo. and when the material source changes ³
	Unit Weight ^{1 or 11} per Tex-404-A	
	Moisture Content ^{1 or 10} per Tex-409-A, Tex-425-A, or ASTM C 566	1 before the first batch of concrete placed each day and when there is an apparent change ⁴
Coarse Aggregate	Sieve Analysis ¹ per Tex-401-A	1 per 2,000 cu. yd. of concrete production, minimum 1 per wk. per source ²
	Decantation ¹ per Tex-406-A	

Material	Test Method	Frequency
	Specific Gravity and Absorption ^{1 or 11} per Tex-403-A	1 per 6 mo. and when the material source changes ³
	Unit Weight ^{1 or 11} per Tex-404-A	
	Moisture Content ^{1 or 10} per Tex-409-A, or ASTM C 566	1 before the first batch of concrete placed each day and when there is an apparent change ⁴
Conventional Concrete	Slump ⁵ per Tex-415-A (ASTM C 143)	1 from first concrete batch, 1 for each set of compressive strength cylinders, and 1 from another concrete batch ⁶
	Temperature ⁵ per Tex-422-A (ASTM C 1064)	
	Air Content (for air-entrained concrete) ⁵ , per Tex-414-A (ASTM C 173) and Tex-416-A (ASTM C 231)	Test in accordance with Item 421
	Unit Weight ⁵ per Tex-417-A (ASTM C 138)	1 per month per mix design and when a new mix design is established ⁷
	Making Test Cylinders ⁵ per Tex-447-A (ASTM C 31)	1 set during last 25% cast for each lot and in accordance with Tex-704-I
	Compressive Strength ⁸ per Tex-418-A (ASTM C 39)	In accordance with Tex-704-I
	Initial Time of Set ⁵ per Tex-440-A (ASTM C 403)	When a new mix design with accelerating admixture is established or accelerated curing will be used, and as directed
Self-Consolidating Concrete (SCC)	Slump Flow and VSI Rating ⁵ per ASTM C 1611	1 for each of the first 2 batches of concrete placed, 1 for every 5th continuous batch (not delivered load) thereafter, and 1 for each set of compressive strength cylinders ⁶
	Air Content (for air-entrained concrete) ^{5,12} per Tex-414-A or Tex-416-A	Test in accordance with Item 421
	Temperature ⁵ per Tex-422-A	1 for the first batch of concrete placed and 1 for each set of compressive strength cylinders ⁶
	Unit Weight ^{5,12} per Tex-417-A	1 per month and when a new mix design is established ⁷
	Making Test Cylinders ^{5,12} per Tex-447-A	In accordance with Tex-704-I, and as directed
	Compressive Strength ⁸ per Tex-418-A	
	T-50 ⁵ per ASTM C 1611	2 per year (summer and winter) and when a new mix design is established
	Passing Ability (J-ring) ⁵ per ASTM C 1621	
	Segregation Column ⁹ per ASTM C 1610	
	Bleeding ^{5,12} per ASTM C 232	When a new mix design with accelerating admixture is established or accelerated curing will be used, and as directed
Initial Time of Set ^{5,12} per Tex-440-A (ASTM C 403)		

- QC personnel with current ACI Aggregate Testing Technician Level 1 must perform these tests.
- For new aggregate sources and after a failing test for existing sources, increase testing frequency to 1 per 500 cu. yd. of concrete production, tested prior to use, until obtaining 3 consecutive passing tests. Do not use failed aggregate in the concrete without approval.
- Use results from this test to proportion new concrete mix designs and to adjust existing concrete mix designs.
- When aggregate weighing hoppers or storage bins are equipped with properly maintained electric moisture probes for continuous moisture determination, these moisture tests are not required daily. Electric moisture probes, however, must be verified weekly against Tex-409-A, Tex-425-A, or ASTM C 566 test results to ensure that the compared values do not vary more than 0.3%. The sample for moisture verification test must be representative of the material located where the electric moisture probe is registering moisture readings. Electric moisture probes are required for SCC unless approved by the Engineer. If approved, test moisture content every 4 hours and when there is an apparent change while SCC is being produced.
- QC personnel with current ACI Concrete Field Testing Technician – Grade I certification must perform these tests. If a test fails, test every delivered load until 3 consecutive tests pass.
- Per mix design per cast date.
- When the fresh unit weight of concrete varies from the established value by more than ± 2 lb. per cu. ft., check the air content first to determine if air content has changed from the initial mix design. If air content is correct, check aggregate unit weight, gradation, moisture content, specific gravity, and that the mix proportions have not changed. Verify the fresh unit weight of concrete after making adjustments.
- QC personnel with current ACI Concrete Strength Testing Technician certification must perform this test.
- QC personnel qualified by the Department for this particular test must perform this test.
- Fabricator personnel qualified by the QC Supervisor for this particular test may perform this test.
- Aggregate material supplier may perform the test and provide certified test results.
- Follow ASTM C 1758 for filling of test specimens.

10. FABRICATOR SAFETY POINT OF CONTACT

Designate a safety point of contact. Fabricator must adhere to applicable safety regulations and own safety program.

11. ARCHIVED VERSIONS

Archived versions are available.