

**Tennessee Department of Transportation
Division of Materials and Tests**

Volumetric Concrete Mobile Mixer Approval Procedures (SOP 4-5)

Purpose: The purpose of this document is to outline the approval process of volumetric concrete mobile mixers that provide concrete for Tennessee Department of Transportation (TDOT) projects. These procedures standardize certification throughout the regions, improve concrete quality, assure consistency of product, support quality control, and assure adherence to TDOT Standard Specifications.

Discussion: Volumetric concrete producers must undergo a complete inspection of processes, mixing equipment, laboratory equipment, materials, and technician qualifications.

1.0 Producer Requirements

For approval of each mobile mixer, the producer shall contact Headquarters Materials and Tests (HQMT) at TDOT.Concrete.Email@tn.gov who will then ensure the following requirements are met.

1.1 Materials

All material sources must be TDOT approved. The producer shall retain copies of all material certifications, reports, and test results. These may be kept together at a central facility and made available electronically upon request.

1.1.1. All aggregates sources shall be on the Producer List and in accordance with TDOT Standard Specifications Sections 903.25.

1.1.2. All cements shall be on the Producer List and in accordance with TDOT Standard Specifications Section 901.01.

1.1.3. Other cementitious and pozzolanic materials shall be on the Producer List and in accordance with TDOT Standard Specifications Sections 921.15 or 921.16.

1.1.4. All admixtures shall be listed on the TDOT Qualified Products List (QPL) and in accordance with TDOT Standard Specifications Sections 604.03 and 921.06.

1.1.5. All water shall be in accordance with TDOT Standard Specification 921.01. Test results shall be submitted to the appropriate Regional Materials and Tests Supervisor within thirty (30) days of the tests.

All documentation in the following sections shall be organized and kept with each mobile unit.

1.2. Technician Qualifications

1.2.1. The mobile unit shall have personnel certified according to TDOT Standard Specifications as well as SOP 1-3: Field Technician Certification Requirements.

1.2.1.1. To perform calibrations and operate the mobile mixer, the technician must have the following certifications: TDOT Concrete Field Technician and VMMB Volumetric Mixer Operator.

1.2.1.2. Tests for aggregate moisture contents and gradations shall be performed by someone who holds a TDOT Concrete Plant quality Control Technician Certification or a TDOT Aggregate Technician Certification.

1.3. Process Control Plan

1.3.1. The producer shall develop an Annual Volumetric Mobile Mixer Process Control Plan that outlines the steps or procedures that will ensure that the concrete meets the minimum TDOT Standard Specification requirements and submit it to HQMT for approval.

1.3.2. For each project, a Placement Site Process Control Plan approved by Regional Materials and Tests shall be submitted at the preconstruction conference.

1.4. Calibration Procedure

The mobile unit shall submit a calibration procedure to HQMT that includes, at a minimum, detailed procedures for pre-calibration checks, calibration, and post-calibration volumetric yield test. Any changes in the calibration procedure shall be submitted to HQMT immediately. All calibrations shall be documented and kept in the mobile unit.

1.5 Process Control Inspection

Each mobile unit as well as each producer's central facility shall have an inspection. The results will be documented on the Volumetric Inspection Checklist.

1.5.1 Mobile Unit Inspection

The mobile unit inspection shall be performed by HQMT and include a review of the continuous mixer, proportioning devices, scales used for calibration, yield box, admixture dispensers, Volumetric Mixer Manufacturers Bureau (VMMB) plate, auger/mixer wear, storage bins/silos, and recording meters.

1.5.2 Central Facility Inspection

Regional Materials and Tests will inspect the central facility's laboratory and material storage (e.g., stockpile maintenance). The producer shall have a Type A laboratory as defined in TDOT Standard Specification Section 106.06 and SOP 1-4: Laboratory Qualification Requirements to conduct any required testing. The laboratory inspection shall include a review of weighing devices; oven; sampling, reducing, and shaking equipment; thermometers; and other apparatus necessary to perform standard tests and practices.

1.6 Approval

Upon completion and documentation of initial inspection, HQMT will place the producer's approved mobile unit on the Producer List.

1.7 Mix Designs

Each mobile unit shall have an approved, project specific, concrete mix design as outlined in SOP 4-4: Submittal and Approval of Concrete Mixture Designs for each class of concrete being produced for a TDOT project. A TDOT Concrete Mix Design Technician shall submit and sign each mix design. Mix designs shall be submitted to TDOT.Concrete.Email@tn.gov.

1.8 Delivery Ticket

Form DT-1756, Concrete Delivery Ticket, or equivalent, must accompany each load. The ticket must have all the required information according to TDOT Standard Specifications Sections 501.03, 604.03, and 604.04 including the signature of the producer's VMMB Certified Volumetric Mixer Operator.

1.9 Quality Audit

A producer's mobile unit approval is contingent upon continuous, satisfactory field performance as well as periodic inspections of material. In addition to the quality monitoring outlined below, approval may also be rescinded if there is any concern for safety that may be related to the approved material as determined by a visual inspection.

1.9.1 After initial approval, on an annual basis, the volumetric mixer process control procedures, required paperwork, laboratory, and mobile unit will be inspected by Regional Materials and Tests. Construction personnel can request additional visits be completed in the event of issues on TDOT project sites.

1.9.2 HQMT shall notify the producer of any failing inspection results as soon as possible; at which time a representative from the producer, Regional Materials and Tests, and HQMT will hold a meeting to identify the location/distribution of the failing material and to develop a plan for both the utilization of any existing material and the acceptance of newly produced material.

2.0 Removal from Producer List

2.1 If a mobile unit is inactivated on the Producer List, HQMT shall immediately notify the producer, and in writing within seven (7) days.

2.2 To be reactivated on the Producer List, the producer shall request a meeting with the Regional Materials and Tests and HQMT to discuss actions the producer plans to take to resolve any issues of non-compliance. Once it has been demonstrated that the Volumetric Mobile Mixer and Central Facility meets TDOT specifications, HQMT shall notify both Regional Materials and Tests and the producer that the plant has been reactivated.