WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIAL CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

QUALITY ASSURANCE PROCEDURES FOR CALIBRATION AND APPROVAL OF CONCRETE VOLUMETRIC MIXERS

1. PURPOSE

1.1. To set forth the Division's Quality Assurance procedure which governs the calibration, and approval of concrete volumetric mixer units.

2. SCOPE

2.1. This procedure establishes guidelines for verifying the contractor's calibration of volumetric mixers; and provides an Attachment for QA documentation of the calibration.

3. CALIBRATION FREQUENCY

3.1. The Contractor shall perform the calibration of volumetric mixers prior to the start of placement in the presence of the District.

3.2. The Division's project designated personnel shall verify that the contractor has completed all mixer calibrations, per mobilization of each unit. Additional calibrations may be required at the discretion of the Division's project designated personnel. Alterations to the approved mix design will require the unit to be recalibrated.

3.3. The Contractor shall provide documentation for any unit repair. After the unit has been repaired, it shall be recalibrated prior to use on a project.

4. PRE-CALIBRATION INSPECTION

4.1. Division personnel, or the designated inspector shall verify that the contractor confirmed all components of the unit are functioning properly, and all material component bins are empty and clean, the main conveyor belt and supply systems are clean, and all vibrators are functioning properly prior to the start of the calibration.

4.2. MIX DESIGN

The Division's designated personnel shall review the approved mix design prior to the start of the calibration and record them on Attachment 1.

4.3. QUALITY CONTROL PLAN

The Division's designated personnel will review the contractor's Quality Control Plan prior to the start of calibration. Any deviations from this procedure will be documented

in the Contractors Quality Control Plan. Possible deviations include the addition of fibers, which shall be calibrated according to the manufacturer's recommendations.

5. FIELD CALIBRATION PROCEDURE

5.1. For cement, sand and stone, verify that the contractor begins each by filling the specific material bin until the augers are completely covered, set mobile mixer to run at proper operating speed, and that the Contractor is using a clean container that can be placed under the chute of the mixer to catch all discharged material.

5.2. CEMENT CALIBRATION

The Division's designated personnel shall verify that the Contractor has checked the discharge tube at bottom of the cement bin and that it is clean and clear of residue. After reaching the predetermined count, the Division's designated personnel shall record the weight of cement, the elapsed time, and the meter count provided by the Contractor on Attachment 1. The contractor shall perform a minimum of 3 trials and provide the calculations to the Division's designated personnel, who will record the data on Attachment 1.

5.3. SAND AND STONE CALIBRATION

After reaching the predetermined count, the Division's designated personnel shall record the weight of aggregate, the elapsed time, and the meter count provided by the Contractor on Attachment 1. Using approximately the same number of counts, the Contractor shall perform a minimum of 3 trials at both high and low settings and record.

5.4. WATER AND LATEX CALIBRATION

Division's designated personnel will verify that the Contractor adjusts the setting to achieve the target weight of water, or latex. The Contractor shall discharge the water, or latex into a suitable container capable of catching all material. The Division's designated personnel will record the weight of material discharged provided by the Contractor on Attachment 1. The contractor shall perform a minimum of 3 trials on both the water and latex.

5.5. ADMIXTURE CALIBRATION

Division's designated personnel will verify that each admixture is calibrated and used in accordance with manufacturer's recommendations and adheres to the proportions specified in the approved mix design. The Division's designated personnel shall record the application rate provided by the Contractor on Attachment 1.

5.6. YIELD TEST

The Contractor shall perform one yield test of ¼ cubic yard for every calibration performed. All materials and settings used during the yield test will be from those established during the calibration process.

The Division's designated personnel will record the results provided by the Contractor for the calculated yield in Attachment 1. The weight batched divided by the unit weight tested should be within ±2% of the theoretical quantity batched. If the calculated yield is not within ±2% of the theoretical yield, additional calibrations will be performed until the required yield result is achieved.

If after 3 trials the required yield is not achieved, at the discretion of the Engineer a unit may not be certified to perform the concrete placement until the Contractor has proven he has taken corrective action to improve the unit's performance

Michael Mance

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MP 679.02.99 Steward – Cement and Concrete Section
MAM:T
ATTACHMENT

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
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CONCRETE VOLUMETRIC MIXER FIELD CALIBRATION SHEET

Project Number: _____ County: _____
District: _____ Contractor: _____
Truck Number: _____ Description: _____
Calibrated By: _____ Date of Calibration: _____
Verified By:_____

MIX DESIGN: Approved Mix ID: _____

Material	Cement	Sand	Stone	Water	Latex		
Amount							

Theoretical Yield: _____(cubic yard)

CEMENT:

	Weight (Lbs.)	Meter Count	Time (sec.)
1			
2			
3			
4			
5			
Totals			

$\text{Lbs./Count} = \frac{\text{Total Lbs.}}{\text{Total Counts}} = \frac{\quad}{\quad} = \_\_\_\_\_$

$\text{Lbs./Sec.} = \frac{\text{Total Lbs.}}{\text{Total Sec.}} = \frac{\quad}{\quad} = \_\_\_\_\_$

$\text{Counts for 94 Lbs.} = \frac{94}{\text{Lbs./Count}} = \frac{94}{\quad} = \_\_\_\_\_$

$\text{Sec. for 94 Lbs.} = \frac{94}{\text{Lbs./Seconds}} = \frac{94}{\quad} = \_\_\_\_\_$

SAND: Moisture Content: _____

Setting	_____(Low)	_____(Low)	_____(Low)	_____(High)	_____(High)	_____(High)
Amount (Lbs.)						

STONE: Moisture Content: _____

Setting	_____(Low)	_____(Low)	_____(Low)	_____(High)	_____(High)	_____(High)
Amount (Lbs.)						

WATER: Time for Calibration: _____

Setting					
Amount (Lbs.)					

LATEX: Time for Calibration: _____

Setting						
Amount (oz.)						

ADMIXTURE: Time for Calibration: _____ Target Flow Rate: _____

Setting						
Amount (oz.)						

CALCULATED YIELD: _____(cubic yard)