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Bureau of Technical Services
Concrete Materials Unit
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MEMORANDUM: Concrete QMP – Missed QV Tests

Background:
WisDOT is required to test material at the testing frequency specified in their Quality Management Program (QMP). Additionally, WisDOT's Quality Verification (QV) testing is **required** to validate the quality of the material if Quality Control (QC) tests are used for acceptance. If no verification testing is conducted in a lot, QC sampling and testing **cannot be used for acceptance**. In such case, WisDOT has no basis for material acceptance and is not meeting their Quality Assurance Program (QAP) requirements specified in 23 CFR 637.207 (a)(1)(i)(A) and (a)(1)(ii)(B).

This memorandum applies to projects that did not meet the requirements outlined in the Wisconsin Department of Transportation (WisDOT) Standard Specification (SS) Concrete QMP Sections 701, 710, 715, and 716 due to missing required QV tests by the department during construction. Regional Technical Services Section (TSS) staff should follow this memo to assist Project Development Section (PDS) staff on a per-project basis to properly document any situations related to missed QV tests. A missed QV test is not acceptable. This memorandum must be followed to conduct necessary follow-up testing and documentation to comply with the WisDOT QMP requirements. This memorandum directs how to handle different missed QV test scenarios.

Prevention of Missed Tests:
The work to conduct follow-up testing requires additional time and resources to complete. Ensure every effort is put towards sampling at the correct locations along the project. For concrete, one of the primary causes of missed tests is use of multiple mixtures designs by the contractor. Each mixture design requires a new lot system and random numbers per sections 701, 710, 716, and 715 of the standard specifications.

- Per SS 106.1.1 (2) *"…Notify the engineer of the proposed source of materials before delivering those materials to the project site…"*
- Per SS 106.1.1(4), *"Do not incorporate materials into the work until the engineer approves those materials…"*
- To ensure contractor compliance with these specifications, request a Material Placement Notification (MPN) before placing material. The contractor shall provide the MPN to the engineer in writing prior to incorporation of the materials into the work (see guidance for MPN on page 3):
    - List of mix designs to be used
    - Location of material placement on the project for each application
    - Estimated quantity
    - Date of placement and the anticipated number of lots and sublots for QC tests

Tracking multiple mixture designs can create communication difficulties between project staff and the contractor where the department or consultant's random number is not reached prior to a mixture design change. Project staff will perform the following to ensure the department meets the requirements of 23 CFR 637.207 (a)(1)(i)(A) and (a)(1)(ii)(B).

- Take a random QV sample within the first sublot for each new lot and a second random QV sample for the entire lot. Only one QV sample is needed if the random test location to represent the entire lot occurs in the first sublot. The same process (SS 701.3.2) will be used for determining all random numbers prior to construction. The department and contractor random samples within the first sublot will be used to represent an entire lot if the contractor's mixture design changes before the second random QV sample location is reached. If the mixture design does not change, use test results from the sample that was randomly determined for the entire lot. Record test results from the first lot for informational purposes.

These proactive measures will help prevent missed tests and should eliminate the need for follow-up testing described below.

Handling Missed QV tests:
Under WisDOT's QMP specifications, materials are approved based on the contractor's QC sampling and testing when they conform to specifications and when the results are validated by department QV sampling and testing. For contractor QC data to be validated and payment to be processed, QV testing must be performed. The department and consultant overseeing or performing the testing must take precautions as outlined above. In rare cases where QV tests are missing, follow Table 1 below for follow-up testing and documentation requirements based on missed test type. Only AASHTO/CCRL accredited labs are able to perform follow-up testing.

For missed QV tests, the department will assess costs of follow-up testing as follows:

- For a missed QV test when a MPN is received before placing material and the testing is overseen/performed by a consultant, the consultant will bear the cost of the follow-up testing.

- For a missed QV test when a MPN is received before placing material and the testing is overseen/performed by the department, the department will bear the cost of the follow-up testing.
- For missed QV tests, when a MPN is not received before placing material, the contractor will bear the cost of follow-up testing. The department will complete the required follow-up testing and administer a non-performance credit for the cost of testing.

Table 1: Handling Missed QV Tests

Missed Test Type		Other Tests Performed in a Lot	Follow-up Test Requirements	Follow-up Documentation Requirements
Compressive Strength of Cylinders (WTM T22)		Air, slump, temperature, surface resistivity	Compressive strength of cores (WTM T24) [1]	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2 and document the results of follow-up testing. • Use the follow-up testing data to determine incentive/disincentive per SS 715.3.2, SS 715.5, SS 716, CMM 810.4.4, and CMM 810.5.
Flexural Strength of Beams (WTM T97)		Air, slump, temperature, surface resistivity	Compressive strength of cores (WTM T24) [2]	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2 and document the results of follow-up testing. • Use the follow-up testing data to determine incentive/disincentive per SS 715.3.2 and SS 715.5.
Air (WTM T152 or WTM T395)		Strength tests, slump, temperature, surface resistivity	Hardened air test (ASTM C457) and CMM 870.5.2	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2 and document the results of follow-up testing. • Use the follow-up testing data to determine incentive/disincentive per CMM 810.5.1.2.
Slump (WTM T119)		Strength tests, air, temperature, surface resistivity	None	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2. • For slip-formed mainline concrete pavement, slump tests are not required per SS 710.5.2. • Accept if other testing data is in conformance with SS. Visual observation of concrete workability may be used for acceptance.
Temperature (AASHTO T309)	Mainline Pavement/ Ancillary	Strength tests, air, slump, surface resistivity	None	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2. • Accept if other testing data is in conformance with SS.
	Structures and Cast in Place Barrier			• In DT1310 form, document the required information per CMM 845.5.1.2.1.2. • Accept if other testing data is in conformance with SS.
Surface Resistivity (WTM T358)		Strength tests, air, slump, temp	None	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2. • Accept if other testing data is in conformance with SS.
Concrete Aggregate Gradation (WTM T27/T11)		Strength tests, air, slump, temperature, surface resistivity	Perform follow-up testing on the aggregate within 1 business day and document the results.	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2. • Accept if follow-up aggregate sample and other testing data is in conformance with SS.
Missing Multiple (two or more) Tests		None	Compressive strength of cores (WTM T24) [1,2], hardened air test (ASTM C457) and CMM 870.5.2	• In DT1310 form, document the required information per CMM 845.5.1.2.1.2 and document the results of follow-up testing. • Use the follow-up testing data to determine incentive/disincentive per SS 715.3.2, SS 715.5, CMM 810.4.4, and CMM 810.5.

[1] Cores for high early concrete (HES) and concrete base are not required. For concrete structures and cast-in-place barrier, contact BTS and BOS prior to taking cores.

[2] Compressive strength of cores used to replace a missed test for flexural strength of beams shall meet the minimum compressive strength limits for pavements (3,700 psi) and structures (4,000 psi for superstructures and 3,500 psi for substructures or as specified in the plans) per SS 715.5.

Guidance for Material Placement Notification (MPN):

The MPN requires the contractor to notify the department regarding the proposed placement of concrete materials in writing. MPN shall be provided at least one business day prior to placement. For nightwork, the contractor and engineer may mutually agree on an alternate timeframe for MPN. The MPN shall be sent via email to the engineer and the engineer's materials coordinator. The MPN should also be sent via email to the Prime Contractor, the Subcontractor performing the work (if different than the Prime), and the Contractor's Designated Project Materials Coordinator. This email distribution list shall be documented in the QC plan and reviewed by the engineer. The engineer shall document and contact TSS for all instances when an MPN is not provided. If multiple suppliers are providing concrete on the same job, the contractor shall distinguish which location each supplier is providing material for.. Below are some examples of the MPN:

- Excel form to collect the pertinent information for proper sample scheduling:

Project ID	Submitted By Name / Company	Proposed Date of Placement	Proposed Time of Placement	Proposed Quantity Placed	Proposed Units of Measurement	Work Type	Slipform or Non-Slipform	Contractor Mix Design ID	WisDOT 132 Mix ID	Material Producer	Plant Location	Proposed Number of QC sublots	Proposed Location of Placement
1234-11-11	John Doe, XYZ Company	4/1/2025	6:00 AM	2000	CY	Concrete Pavement	Slipform	Mix #8908	132-681-25	Redimix 123	Badger Plant #1	8	1800+50 NB
6789-00-00	Jane Doe, ABC Company	4/1/2025	6:30 AM	250	CY	Concrete Structures	Non-slip form	Mix #68121	132-623-25	Redimix XYZ	Badger Plant #4	5	East Abutment Wall

- Email notification with the pertinent information for proper sample scheduling:

  Project ID: 1234-11-11
  Submitted By Name / Company: John Doe, XYZ Company
  Proposed Date of Placement: 4/1/2025
  Proposed Time of Placement: 6:00 AM
  Proposed Quantity Placed: 2000 CY
  Work Type: Concrete Pavement
  Slipform or Non-Slipform: Slipform
  Contractor Mix Design ID: Mix #8908
  WisDOT 132 Mix ID: 132-681-25
  Material Producer: Redimix 123
  Plant Location: Badger Plant #1
  Proposed Number of QC Sublots: 8
  Proposed Location of Placement: 1800+50 NB

- The engineer and contractor may mutually agree to an alternate process to submit the MPN, such as using a shared drive and spreadsheets, provided all pertinent information and time of notification is clearly documented.

The guidance included in this memo shall be considered interim guidance and enforceable until formal revisions the Standard Specifications and Construction and Materials Manual are completed and published. Please contact BTS - Concrete Materials Unit if there are questions related to this memo. BTS will coordinate with BPD as it relates to contract management questions.