506 Ready-Mix Concrete Quality Management Plan

506.1 Introduction

The purpose of the Ready-Mix Concrete Quality Management Plan (QMP) is to establish procedures for becoming pre-qualified as a supplier of ready-mix concrete. The QMP is to assure the Utah Department of Transportation (UDOT) that permanent and portable ready-mix concrete batch plants are capable of producing a quality ready-mix concrete product. Only pre-qualified batch plants will supply to UDOT projects.

506.2 Pre-qualifications for Ready-Mix Suppliers

Applicants will request in writing to designation as a pre-qualified supplier. Address requests to:

UDOT Concrete Engineer
4501 South 2700 West
Salt Lake City, Utah 84119
Phone Number: 801-965-3814

Request will include:

- Copy of Certification from National Ready Mixed Concrete Association (NRMCA) batch plant certification program.
- Name and phone number of the Quality Control Manager (QCM) for scheduling of inspections and general information.
- Signature of a representative having legal authority to bind the company.

The Concrete Engineer will notify in writing the pre-qualification status of the Ready-Mix Concrete.

506.3 Ready-Mix Supplier agrees to:

- Meet or exceed UDOT’s Standard Specifications, including all applicable AASHTO and ASTM specifications.
- Make available to the Concrete Engineer or representative all records required by this QMP when requested.
- Submit to a minimum of one batch plant inspection per year in order to maintain qualification.

506.4 Concrete Unit Plant Inspection Program

- Suppliers will pass an inspection performed by Central Materials before acceptance as a pre-qualified batch plant. Portable batch plants must be inspected each time they are moved.
- Failure to meet one or more of the requirements listed in this QMP may result in an accelerated inspection program. Any additional failures to meet these minimum requirements will result in the suspension of the plant as a pre-qualified supplier until correction of all documented deficiencies. The supplier may be reinstated as a pre-qualified supplier after a mandatory review of the supplier’s QC program.

506.4.1 Concrete Unit Inspector Guidelines:

Initial pre-qualification inspection is scheduled at the request of the supplier. Subsequent inspections are coordinated with the Central Materials inspector and supplier. Upon completion of the inspection the Concrete Engineer will recommend one of the following:

a) **Qualification** as a pre-qualified Ready-Mix concrete plant.

b) **Not qualified** as a pre-qualified plant. The inspector will submit a written report to the supplier outlining all deficiencies observed during the plant inspection process. The supplier is required
to address all deficiencies noted in the inspector’s report, at which time the supplier may request another pre-qualification inspection.

506.4.2 Inspector Check List:

a) Verify current NRMCA batch plant certification.
b) Verify aggregate source suitability.
c) Examine and review the distribution of the plants QC Policy Statement and manual.
d) Review QC training records.
e) Review the plant records to confirm that a Quality Inspector (QI) is assigned to each work shift and has signed the inspection checklist.
f) Interview the person(s) responsible for QC policies and procedures.
g) Verify the QI lines of authority.
h) Examine the plant’s equipment certification records.
i) Examine the plant’s agitating ready-mix truck inspection records.
j) Inspect testing equipment for damage and ensure all equipment is in good repair.
k) Verify UDOT TTQP Qualification of supplier or contract laboratory.
l) Verify maintenance of production QC testing records.

506.5 Batch Plant Quality Control Policies and Procedures

The supplier will provide adequate training for all QC personnel in the company’s QC procedures and supply each Quality Inspector (QI) with a copy of the company QC Policy Statement, and QC manual including, at a minimum, the plant certification technical criteria set forth in this document. The supplier will have a designated QI present on every work shift. The QI will have the authority to enforce the procedures.

506.6 Batch Plant QC Procedure Requirements:

The Supplier will:

- Develop, review, and update as necessary, a company QC policy statement and manual. The QC manual must be approved by the Concrete Engineer before acceptance as a pre-qualified supplier. The QC manual shall contain, at a minimum, all requirements listed in the NRMCA’s “Ready Mixed Concrete Quality Control Guide.”
- Designate a QI for every work shift. The QI must be TTQP Concrete Field Technician certified and have a minimum of six (6) months experience working in a ready-mix concrete batch plant and an ACI Self-Consolidating Concrete Technician certified if the plant produces a UDOT-approved SCC mix. The QI must be present while the batch plant is producing concrete for UDOT projects.
- Conduct meetings with the QCM and designated QI’s, a minimum of once every three months to review the company’s QC procedures, discuss possible changes and implement any procedural changes.
- The QCM or designated representative will review and evaluate the QC techniques of all QI’s once every six months to assure compliance with QA Section guidelines and certification procedures.
- Submit to a minimum of one plant inspection each year by a Central Materials Inspector.
- Address and document each deficiency noted in the inspection reports and conduct monthly follow-up meetings for a period of three (3) months to assure compliance.

506.7 Required QC Records:

Supplier will keep records of the following:
- QC testing performed at a frequency consistent with approved Quality Control Plan.
• Approved mix designs, trial batch test results, and aggregate source suitability updated yearly. Aggregate source suitability shall be consistent with UDOT Standard Specification 03055 Portland Cement Concrete. Aggregate source suitability will include an evaluation of aggregate reactivity in accordance with AASHTO M 6 and AASHTO M 80, with the exception that ASTM C 289 is not an acceptable evaluation of aggregate reactivity. If an aggregate source has been shown through previous testing to be reactive, submit test results verifying mitigation through approved AASHTO/ASTM test methods. Aggregate reactivity evaluations are not required for lightweight aggregates defined by AASHTO M 195.

• Manufacturer’s Certificate of Compliance for all admixtures.
• QCM and QI current TTQP Qualifications, verification of experience, and QC training records.
• Submit to a minimum of one plant inspection each year.
• A written “new employee” training and/or orientation policy in the company files.
• Proof of current NRMCA certification.
• Complete inspection checklist signed by the QI for each work shift.
• Minutes of meetings of the QCM and QC personnel.
• QCM evaluation of the QI performance.
• Comprehensive reports signed by the QCM that detail the plants response and follow-up to each specified deficiency documented during inspection.

506.8 Equipment Certification Requirements:

• Maintain certification of beams, scales, water meters, moisture probes, and admixture dispensers as per UDOT Standard Specifications.
• Maintain certification of concrete testing equipment as per AASHTO Specifications.
• Remove broken or malfunctioning equipment from service immediately and replaced with new or repaired/recertified equipment.
• Use only UDOT qualified laboratories for concrete compressive strength tests.
• Conduct yearly inspections of all ready-mix trucks in accordance with NRMCA guidelines and maintain a file of current ready-mix truck inspection documents.
• Required Records:
• Comprehensive reports signed by the QCM that detail the plants response and follow-up to each specified deficiency documented during a Concrete Unit Inspection.

506.9 Production Delivery Requirements:
Each load of ready-mix concrete delivered to a state project shall be accompanied by the following information printed on an appropriate form. Hand written forms will not be accepted.

• Target water/cement ratio (w/c)
• Quantity of cementitious material used (lb)
• Target quantity of water based on w/c (lb or gal)
• Quantity of water actually used (lb or gal)
• Aggregate source
• Weights of coarse and fine aggregates (lb)
• Moisture content (as batched) of coarse and fine aggregates (%)
• Batching time
506.10 Volumetric Concrete Mixer Certification:

NOTE: The following section outlines the certification process for volumetric concrete mixers. It does not imply that this equipment is acceptable for all uses. Volumetric concrete mixers must have the approval of the Region Materials Engineer and the Resident Engineer.

Volumetric concrete mixers supplying UDOT projects require an annual inspection and certification. A UDOT inspector or representative will verify compliance with the following (See Appendix A checklist for tolerances):

- The supplier maintains a QC manual which includes at a minimum, a company QC policy statement, a hot and cold weather plan according to UDOT specifications, training procedures for all QC personnel and the plant certification technical criteria set forth in this document. The supplier will have a designated QI present on every work shift with the authority to enforce the procedures.
- Verify VMMB rating plate 100-1 affixed to the mixer or comparable calibration and uniformity testing records.
- Verify certification of the scale used for equipment calibrations. Certification must be conducted by an independent qualified expert.
- Verify bin condition and accuracy of cementitious delivery system. Verification of the delivery system must be by an NRMCA certified batch plant inspector.
- Verify through an NRMCA certified batch plant inspector the accuracy of the aggregate delivery system.
- Verify through an NRMCA certified batch plant inspector the accuracy of the water delivery system.
- Verify that admixture storage tanks are protected from freezing and contamination. Verify through an independent calibration company the accuracy of the admixture delivery system.
- Perform Uniformity of Batching tests according to Appendix A and provide results from an independent laboratory meeting the requirements of Appendix A, Table 1 or a TTQP qualified technician from UDOT.
- Each mobile unit shall maintain and provide records of material delivered as described in Appendix A.

The UDOT inspector or representative will sign and affix a sticker with an expiration date certifying the mixer for use when approved.