Construction Advisory

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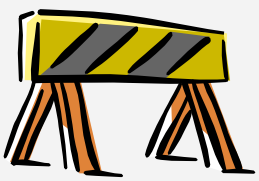

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Quality Concrete Control and Concrete Quality Assurance for Projects Funded by the American Recovery and Reinvestment Act (ARRA)

To meet ARRA risk management objectives, this construction advisory serves as a reminder that careful attention must be placed on the roles and responsibilities for the department staff, as well as the contractor, relative to managing quality control and quality assurance (acceptance) for Portland cement concrete, as described in sections 604 and 605 of the *2003 Standard Specifications for Construction*.

Contractor Quality Control (QC) for Concrete – (Section 604) The contractor must provide quality control for all concrete production and placement on all projects.

- QC plans must be submitted at least ten days prior to production, describing in detail their sampling, testing, and associated activities for the project. An approved QC plan must be in the project files prior to concrete production. (604.03.A)
- Contractor records for QC testing must include, as minimum, fresh concrete properties documentation, associated correction factors, I.D. numbers for all strength specimens, and QC testing personnel names and certification numbers. (604.03.C)
- The contractor must submit all QC records and reports (including documentation of what action was taken to correct deficient concrete) to the engineer within 24 hours after the date covered by the report. (604.03.A)

Concrete Quality Assurance (QA) – (Section 605) All concrete must be sampled and tested by either the contractor or the department, as follows:

Mix Design Verification -

- For concrete types covered by the QA program, the contractor must develop the mix design, mixture proportions, perform all field sampling and testing, and deliver the test specimens to the department laboratory for 28-day compressive strength testing. This includes Grade P1(Mod) concrete mixtures. (605.01, 605.02)
- For concrete types not covered by the QA program, the department must provide the mixture proportions to the contractor and perform all QA sampling and testing. (605.01, 601.03.G.6.b, 603.02.A, 701.03.G.2, 703.02)

Chain of Custody and Documentation - Proper documentation for all concrete QA is required to assure that specification requirements are met, and the chain of custody for all QA test specimens is preserved at all times.

- Provide the contractor's QA staff with a sufficient number of metal I.D. tags for test specimen identification prior to concrete production. (605.03.C)
- Do not release the random QA sample location to the contractor's QA testing technician until just prior to QA sampling and testing.

- An MDOT inspector must witness the contractor's QA sampling, testing, and installation of a metal I.D. tag into each 28-day concrete strength test specimen. Each I.D. tag must remain affixed to its corresponding test specimen at all time. QA test specimens must not be accepted if they arrive at the department's testing laboratory without corresponding I.D. tags permanently affixed (in the original state) to the hardened concrete, or show indications of being tampered with. (605.03.C)
- An MDOT inspector must record the fresh concrete QA properties, lot identification, I.D. tag number, and all other pertinent information onto form 1174A, or similar. Make note on the IDR of all pertinent reference to QA tests, including details, descriptions of attachments, and references to associated random numbers. (605.03.C)
- The contractor must provide a copy of all QA test documentation (in an approved format) to the engineer at the end of each day on which the cylinders are molded. A copy of this documentation, along with an MDOT sample I.D. form, must also accompany the concrete strength test specimens when they are delivered to the department's laboratory for 28-day compressive strength testing. (605.03.C)

Verification Tests – An MDOT certified concrete technician must conduct at least one set of temperature, slump, and air content tests daily for each grade of concrete.

- Record all fresh concrete properties onto form 1174A, or similar. Make note on the IDR of all pertinent references to daily verification tests, including details of the concrete placement, descriptions of attachments, and any other associated information that will be easily identified in the event of an audit. (605.03.B.3)

It is important that proper QC and QA documentation is complete and on file to ensure that federal funds are not jeopardized for ARRA projects.