

JOB GUIDE**CONCRETE PAVING
PLANT MONITOR****1. Review the Contract and Plans:**

- Become familiar with applicable specifications based upon the size of the project and delivery method of concrete.
- Review incentives and disincentives available.
- Check Schedule of Materials Control for testing rates and sample sizes.
- Attend the pre-construction meeting if possible.
- Attend the pre-paving meeting.

2. Preliminary Testing and Mix Design Requirements:

- Verify the Contractor's aggregate sources and make sure preliminary testing if required has been done well in advance of the project start date.
- Make sure the Contractor submits mix designs to the Concrete Engineering Unit for review and approval a minimum of 21 days prior to initial placement of mix design.

3. Become familiar with concrete batching and mixing equipment and the duties of the Contractor.

- Obtain the Contractor's organizational chart listing names, phone numbers and emails of individuals responsible for mix design, process control administration and inspection.
- Inspect batch trucks for compliance with specifications

4. Complete a *Concrete Paving Contact Report (Form 2164)*:

- Review the Contractor's concrete paving combination plant-lab office for compliance.
- Verify whether the Contractor has an electronic means of communication (email)
- Check that scales and water meter are calibrated
- Obtain pre-production coarse aggregate samples for quality testing in accordance with the Schedule of Materials Control. Fill out Aggregate Sample I.D. cards completely and include with lab samples.
- Verify cement, fly ash, and admixtures are on the Certified/Approved Products list.
- Obtain cement, fly ash, and admixtures samples from the Contractor per the Schedule of Materials Control. Provide sampling containers and witness sampling when possible.
- Include cementitious invoices when submitting samples to the laboratory for testing.
- Fill out lab sample I.D. cards completely and enclose them with cement, fly ash, and admixture samples.

5. During Concrete Production:

- Monitor stockpiling and loading of delivered aggregates.
- Observe scale operation and loading of trucks at a minimum of 2 hour intervals throughout the day.
- Check field hoppers for contamination. If contaminated, have Contractor empty storage and weigh hoppers and re-charge.
- Review mix designs and ensure the Contractor is using correct mix design weights.
- Check multiple times daily that batch weights are adjusted in accordance with current moisture tests, the correct mix design weights are being used and the w/c ratio is not

- exceeding the specification requirements.
- Ensure compliance with minimum and maximum mixing times.

6. Alkali Silica Reactivity (ASR) Sampling:

- Obtain samples of cement, supplementary cementitious materials (fly ash or slag) and sand in accordance with the Schedule of Materials Control.
- Fill out the Sample I.D. card completely and enclose with lab samples. Identify ASR sample with "Project Specific ASR Testing" on ID card.

7. Perform Moisture Tests and Water Content Verification Testing (Microwave Oven):

- Verify contractor performs start-up moisture tests.
- Take additional moistures whenever moisture appearance of delivered aggregate seems to vary or batch water deviates greatly from previous loads.
- Use *Concrete W/C Ratio Calculation Worksheet* to determine moisture contents, batch ticket, w/c ratios, unit weight, microwave oven w/c ratios, charting and w/c ratio incentive/disincentives.
- Review water/cementitious ratio results for compliance with project specifications and verify with microwave oven testing.

8. Aggregate Gradation Testing:

- If testing aggregate gradations in the field, use *JMF Concrete Aggregate Workbook* to calculate gradations, otherwise submit to the lab.
- Verify Contractor is using *JMF Concrete Aggregate Workbook* for gradation testing, determining JMF moving average, charting and well-graded incentives.
- Review Contractor's test results for compliance and compare to the Agency test results (split samples).
- Record Agency gradation test results (split samples) in the JMF Moving Average Summary within the Contractor's *JMF Concrete Aggregate Workbook*.
- If submitting gradation samples to the lab, fill out Aggregate Sample I.D. cards completely including the JMF number found on the Contractor mix design and the QC Gradation results. Identify "QA Gradation" on ID card.
- Determine if Contractor is eligible for well-graded aggregate incentives. Review the Contractor's *JMF Aggregate Summary Workbook*.

9. % Passing 75 μm (#200) Sieve:

- Perform all percent passing the #200 (75 μm) sieve at the Contractor's plant site.
- Verify Contractor washed all fine aggregate gradations to determine the percent passing the #200 (75 μm) sieve.
- Use *JMF Concrete Aggregate Workbook* to calculate the percent passing the #200 (75 μm) sieve in the field.
- Review the Contractor's percent passing the #200 (75 μm) sieve for the coarse aggregate results to determine compliance or if additional testing is required and compare to Agency results.
- Record Agency test results in the Additional Remarks/Comments within the Contractor's *Concrete Aggregate Workbook*.

10. Aggregate Quality Sampling:

- Determine when Aggregate Quality samples will be taken in accordance with the Schedule of Materials Control.

- Fill out Aggregate Sample I.D. cards completely and record the Contractor and Agency - #200 (75 μm) test results.
- Identify Quality samples with a “Q” including the specification reference (Spec 3126 for sand and 3137.2D3 for coarse aggregate) on ID card.
- Identify the Quality Companion samples with a “Q”.

11. Coarse Aggregate Quality Incentive/Disincentive Sampling:

- Determine when random Coarse Aggregate Quality Incentive/Disincentive samples (Class B or Class C aggregates only) will be taken in accordance with the Schedule of Materials Control using the *Coarse Aggregate Quality Incentive/Disincentive Workbook*.
- Fill out Aggregate Sample I.D. cards completely and enclose with lab samples. Identify Incentive samples with “I/D” on ID card.

12. Complete Concrete Ingredient Summary Daily:

- Collect a production summary in an electronic format of the daily total concrete produced and daily total ingredient quantities (aggregate, cementitious and water) including the percent overrun/underrun.
- Collect final project total quantities for concrete produced and ingredients in an electronic format including the percent overrun/underrun.
- Verify daily and final quantities are within tolerances as required by the Specifications.

13. Contractor Records and Charts:

- Obtain the Contractor’s on-site QC records and charts on a daily basis or otherwise directed by the Engineer.
- Review the Contractor’s on-site QC records and charts daily for accuracy and completeness.
- Obtain batch tickets on a daily basis or otherwise directed by the Engineer.

14. Maintain a daily diary:

- Includes hours of production, equipment, weather, concrete air content test results conducted at the plant, air temperatures, concrete yardage totals, and problems or unique circumstances encountered.

15. Submit the following to the MnDOT Concrete Engineering Unit:

- Contact Report
- W/C Ratio Incentive Calculation Worksheets
- Well-graded Aggregate Incentive Worksheets
- Quality Incentive/Disincentive Worksheets

References: MnDOT Specification 2301, 2461, 3126, 3137, Special Provisions, Schedule of Materials Control and MnDOT Concrete Manual.