Asphalt Lab Tester Daily Responsibilities

This guide was created to highlight some of the daily responsibilities of an asphalt field lab tester. Though directed to the Engineer's lab tester, it may also be useful to the Contractor's lab tester.

Communicate questions or concerns to your supervisor, the project Engineer, or the local district materials coordinator. Projects are often unique, and districts may have slight variations.

Terms and acronyms you will see:

CARS – Construction Automated Records System. Web based system for storing project reports and documents.

CARS Materials Drop Box – section in CARS for adding materials test reports.

Diary – paper or electronic documentation created to record daily project observations and test results (QA lab tester)

District Materials Coordinator. Each the eight DOT districts has a materials coordinator. Materials coordinators work with the project engineers to oversee the materials quality.

IA – Independent Assurance the role a District Materials Coordinator (DMC) or their representative works in when they request/collect a materials sample. For asphalt paving, that sample is reduced into 3 or more portions and tested by the Engineer, Contractor and DMC.

QA - Quality Assurance (Engineer – this may be DOT or their representative)

QC - Quality Control (Contractor)

Specs - Standard Specifications for Roads and Bridges This manual contains instruction and specifications for the contractor and Engineer related to construction of projects in North Dakota.

FSTM - Field Sampling and Testing Manual This manual contains sampling and testing instruction for materials such as aggregate and asphalt used in construction of projects in North Dakota.

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1. Field Lab Startup – *Verify*

1) Review lab equipment condition at the beginning and end of project (706.04 B *Spec*)

2) Lab equipment calibration forms are available in both labs.

3) At beginning of project:

   a) Complete *SFN 61067 Field Lab Equipment Checklist*

   b) Submit completed checklist to District Materials Coordinator

4) QC and QA plans are posted in both labs (Section 430.04 A *Spec*)

5) QC tester has required and current certifications

   a) Aggregate Field Lab or Aggregate Designer and Asphalt Mix Tester

      i) Verify TCP Certification

6) Mix design is posted in both labs

   a) Information you need from the mix design:

      i) Specific Gravity of each aggregate source

      ii) Bin splits (Percentage of each aggregate source)

         (1) Value needed for the aggregate blend to determine an accurate specific gravity value

         (2) Included in the daily Fine Aggregate Angularity (FAA) calculation *in paving workbook*

   b) Bin splits may change. Changes must be recorded

      i) New bin split percentage must be entered in the paving workbook

         (1) Specific gravity *blended* value may change

7) The Daily Paving Workbook is used for recording and reporting daily test results.

   a) A Daily Paving Workbook Guide is available for the Daily Paving Workbook

8) PDF/Excel forms are found on the DOT website.

2. Plant Startup – *Verify*

1) Scale certification, does it meet specifications? (109.01.J.1 *Spec*)

2) Check that the contractor's plant is calibrated (Section 154.01 Mixing Plants *Spec*)

3) Identify plant manual and volume conversion tables for storage tank calibration and quantity determination

4) Scalping screen - verify if plant utilizes one

   a) Maximum aggregate size - Plus ½ inch max

5) Bins are equipped with divider plates to prevent intermingling of aggregates

   a) Which bin will be used for each aggregate?

6) Document all information in the diary

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3. Contractor Sampling and Testing

1) QC determines their daily random numbers for sampling before production begins.
   a) Use method in FSTM or an Engineer approved method
   b) Document random method used
   c) QA to be aware of random numbers and sampling times

2) Verify QC Sampling
   a) Aggregate and asphalt mix sampling and reducing.
      i) QC will bag and label and give half to QA (430.02 C.2.b and Section 430.04 E.3 *spec*)
      ii) The half you take is held for future use if needed. It is not automatically tested. If you need to test it, it does not replace your requirement for a daily independent test sample.
   b) Verify samples are correctly numbered in lots

3) Asphalt Content (AC), observe/verify QC as they take plant readings at the time aggregate sample obtained, record on SFN 18674 Asphalt Content & Virgin Aggregate Determination

4) Observe QC testing periodically to ensue required tests and procedures are followed
   a) Including moisture tests at the frequency required (430.02 C.2.a *FSTM*)

5) Verify test results are reported correctly

6) Verify control charts are current
   a) Charts are available in the QC lab
      i) Charts should be readily available to anyone that walks into the lab. (Section 430.04 E.4 *Spec*)

7) Results are within tolerances Section 430, Table 430-07 *Spec*
   a) Watch moving averages.
      i) If trending toward tolerance limits, notify Project Engineer and District Materials Coordinator
   b) Tolerances are different for QC single test, QC moving average, QA, and IA

8) All test reports are fully completed
   a) Include lot number, sample number, date and time sampled, and legibly **signed/typed name of tester with Tech ID**

9) Tests Not in-tolerance and Corrective Action (Section 430.04 E.5.a and b *Spec*)
   a) Contractor is following specifications (corrective action, shutdown)
   b) If corrective action (re-sample/test) is taken, that test does not replace required testing. The results of the re-test help determine if the efforts to correct were effective.
      i) Notify the project engineer or inspector a re-test is needed

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4. QA Sampling and Testing

1) Determine daily random numbers for sampling before production begins
   a) Use method in FSTM or an Engineer approved method
2) Record method used and the random numbers
3) <u>QA sample is an independent sample</u> (Section 430.03. C.1 *FSTM*)

   a) IA samples is the only split *(3-way)* sample

   b) IA samples are in addition to the required daily sample (430.05.1 *FSTM*)
4) Observe QC obtain your sample of aggregate and asphalt mixture
   a) Take possession of sample
5) Observe sampling of liquid asphalt and verify labels are properly completed. (430.02 C.e *FSTM*)
   a) Take possession of samples. This will be sent to DOT Materials in Bismarck
6) Complete required daily testing (Table 430-8 and Table 430-10 *FSTM*)

   a) Enter results into Paving Workbook
7) <u>Compare your test results to the QC results to </u>verify they are in tolerance

   a) Table 430-09 or Table 430-11 *FSTM*

   b) Table 430-15 if an IA 3-way split *FSTM*

   c) Test results comparisons are reported on SFN 61095 Section 430 QC QA and IA Comparison Report

      i) Included in the Paving Workbook
8) Notify project engineer **immediately** of any results that are out of tolerance
9) Contractor may request to see your test results
10) Test asphalt cores for density testing (430.03 C.2 *FSTM*)

    a) Report density results to Engineer and Contractor when completed
11) Additional forms to complete
    a) SFN 10072 Aggregate Quality Tests Summary

    b) SFN 5650 PG Sample Information

    c) SFN 10084 Emulsion/Cutback Sample Information
12) Once final reports are reviewed/approved they are uploaded to CARS Materials Drop Box. This includes the Paving Workbook in Excel format

    a) The individual responsible to add the final reports to CARS may vary by project/district. Verify with the Project Engineer

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5. Plant Inspection – Verify and Documentation

1) Plant settings every morning and throughout the day

   a) Verify district preference to record in your diary if the plant provides a printout

2) Temperature of liquid asphalt in storage tanks throughout the day

3) Temperature of mix (and stack) coming out of the plant throughout the day

4) Scale checks are completed and within tolerance (Section 109.01 *Spec*)

5) Loader/stockpile operations throughout the day

   a) Most critical at end of project as material is being depleted

   b) Observe bins throughout the day

      i) Is the material free flowing from the bins?

6) Check bin splits

   a) Have they changed?

      i) Document on mix data sheet in Paving Workbook

7) Manifests for liquid asphalt

   a) Verify the correct grade of asphalt is delivered and stored in correct tank

      i) If switching different grades of asphalt, switching between virgin and RAP during the day, or switching to a mix design with a different AC target, contractor must shut down and measure/stick the tank for a separate Mix Bitumen Report (SFN 9988).

         (1) *Observe from ground*

      ii) The Construction Records Manual, Chapter 4 provides more detail

8) Cut-off report is to be updated throughout day in the Paving Workbook and finalized each day (SFN 9988 Mix Bitumen Cut-Off Report). Compare with the totals from the Cut-Off report QC created. The reports should be very close (within a couple hundredths of each other). If not, find out why

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6. Diary

1) Complete a diary every day

   a) CARS electronic entry or SFN 16767
   b) See Construction Records Manual, Section 3 for items to record
      i) **Note**: Not all items on the list pertain to a QA lab

2) Record items you have been instructed to verify throughout this document

3) Verify with District Materials Coordinator the format preference and detail expectations

   a) Example diaries are available for review in the Daily Paving Worksheet Examples PDF available through the TCP web page

7. Manuals and Website Links

Standard Specification for Roads and Bridges

Sections of the 2022 editions of manuals and are referenced.

Verify your project requirements and the version referenced on the project plans. They may reference older manual version which may have different section numbers.

Field Sampling and Testing Manual

Construction Records Manual

NDDOT Website

CARS

NDOT Forms

Technical Certification Program

Includes: Certification registry, Daily Paving Workbook Guide, QA Lab Tester Daily Responsibilities Guide