



STATE OF MINNESOTA
OFFICE MEMORANDUM

Office of Materials
Mailstop 645
1400 Gervais Avenue
Maplewood MN 55109

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TO: Resident Engineer Engineers, District Materials Engineers, and District State Aid Engineers
Minnesota Asphalt Industry

FROM: John Garrity, Bituminous Engineer
Jill Thomas, MAPA Executive Director

PHONE: 651-366-5577 (MnDOT)
651-636-4666 (MAPA)

SUBJECT: Best Practices for the 2017 Construction Season

The MnDOT Bituminous Office and the Minnesota Asphalt Pavement Association collaborated on this memo to remind people of Best Practices in Quality Management for the 2017 construction season. More information about specific laboratory testing requirements can be found in the MnDOT Lab Manual.

The following BMPs are a few highlights for laboratory testing:

1. **Gradation Sieves.** It is important to inspect sieves on a daily basis and fix or replace if they are plugged, torn, warped, etc.
2. **Gradation Wash.** When washing the extracted aggregate sample, the test should be run in accordance with the MnDOT Lab Manual. Section 1203.3B of the manual states that when the sample is washed manually, the test is run until the water is fairly clean. For a mechanical washer, the test is run between 5 and 10 minutes with the test ending when the water is fairly clean. Both test methods require adding soap and drying to a constant weight. See Note 7 in Lab Manual 1203 for washing efficiency process.
3. **Rice test.** When sampling and testing at the plant, in order to account for asphalt absorption, the sample needs to be kept heated at the compaction temperature for 30 minutes before splitting and batching into test portions. See guidance temperatures from your asphalt supplier. The manometer or vacuum gauge needs to be verified that it is reading correctly and paperwork needs to be on file to show this. Pycnometer (Rice container) weight should be verified daily including the weight of container underwater. Water bath temperature is required to be at $77^{\circ}\text{F} \pm 1.8^{\circ}\text{F}$.
4. **Density companion cores.** It is very important that proper, careful handling and storage of companion density cores be exercised so they are not damaged. Cores that have been damaged should be recored. To ensure an accurate final dry weight the cores must be chopped up to allow complete drying, see Lab Manual 1810.6. When air drying the core, prior to testing, do not stand the core on its side (upright)

5. **Ignition Oven Correction Factor.** On the first day of production, for each mixture type, both the Contractor and the Agency will establish an ignition oven correction factor from the produced mixture. The procedure is discussed in the Lab Manual, 1853 Appendix. Establish a correction factor for each oven.
6. **Tack Coat.** To avoid contaminating tack samples when sampling from the spray bar waste approximately 1 gallon of tack material before taking the sample. To prevent contaminating material in the distributor avoid using excessive amounts of diesel fuel when cleaning the pump and spray bars and waste the diesel fuel into an appropriate refuse container rather than drawing the diesel fuel back into the distributor.
7. **Warm Mix Additives.** Notify MnDOT when producing WMA using either a water injection system (foamer) or when using warm mix additives. Identify the process or the additive being used and the production temperature and laboratory mixture compaction temperature.
8. **PG Binder & MSCR Test.** MnDOT has implemented the new MSCR PG binder specifications. This update included redoing the PG Binder Guidelines. The updated MSCR PG Binder Guidelines are available on the Bituminous Office web site.

One of the MSCR binder test requirements is percent recovery. This is done to evaluate the percent polymer in the asphalt cement. Therefore, care must be taken to ensure the working tank does not contain too much non-polymer modified binder when adding a polymer modified binder, otherwise, there is a risk of failing material.

9. **Timeliness of test results.** It is imperative the Contractor get any Agency comparison results (Verification sample) or Quality Assurance (QA) results as quickly as possible to be sure changes can be made quickly or out of tolerance issues can be resolved as soon as possible.
10. **New spec book.** The 2018 Specification Book is due out in June of 2017.

Project Design Considerations.

1. **Lift thickness and aggregate size.** To optimize density and minimize the potential for segregation, the lift thickness to maximum aggregate size of the mix should have a ratio of 1 to 3 for fine mixtures and 1 to 4 for coarse mixes. Example: 1.5” minimum lift thickness for “A” gradation and 2” minimum lift thickness for “B” gradation.
2. **Ride table selection.** In the 2399 spec, Ride Equation A is for 3 or more lifts of asphalt pavement, Ride Equation B is for 2 lifts, and Ride Equation C is for 1 lift.

Helpful Links:

The following links will direct you to a webinar series developed by the National Asphalt Pavement Association (NAPA). The webinar series, “Back to Basics” and “Safety in the Workplace” is free to Agencies, State Asphalt Pavement Associations, and NAPA members and can be downloaded.

http://www.asphaltpavement.org/index.php?option=com_content&view=article&id=1113&Itemid=1385
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