Hot Mix Asphalt Reference Guide

I Mix Design Submittal

Submitted to Hot Mix Asphalt Design Laboratory by the contractor on NDOT Mix Design Submittal form – available on NDOT website.

Attachment A: Mix Design Submittal form

Approved Mix Design in Onbase by the Hot Mix Asphalt Design Laboratory Lab - labeled as Approval Letter in NDOT Mat Material Acceptance Documentation – includes Job Mix Formula (JMF) number.

Attachment B: Approval Letter

Any mix design changes shall be submitted on the NDOT Mix Design Submittal form to the Hot Mix Asphalt Design Laboratory Lab thru the consultant.

II Emulsion and Binder Sampling

<u>Emulsion</u> – One 1 Quart sample per type of emulsion per project for each supplier. Delivered to Bituminous Rheology Laboratory within 5 days of obtaining sample.

<u>Binder</u> – One 2 Quart sample per 200 tons binder or portion thereof, per binder grade for each project (for each supplier if more than one). Delivered to Bituminous Rheology Laboratory with in 10 days of obtaining sample.

Both to be tested at the Bituminous Rheology Laboratory in Lincoln.

III Production Sampling and Testing, and Cold Feed Sampling and Testing, and Density

<u>Acceptance Testing</u> – contractor will sample and test all Control Strip samples, unless waived, and all sublot samples from mainline or shoulder paving (not drives or intersections). Sample size should be 75 lbs. – split into 2 representative portions and properly identified. Possession of the verification split sample shall be maintained in a clean, dry, and secure location.

Sample Identification

HMA Samples

One Unique Sample ID# for each verified sublot sample – Cold Feed samples do not have a separate ID#.

2 templates are:

BAF001003 Asphaltic Concrete Sample Submission-Field

BAL003001 Asphaltic Concrete Quality Assurance-Central Lab

Attachments C & D: BAL001003 & BAF003001

Density Cores

One Unique Sample ID# for each verified sublot core or Joint Density core

2 Templates are:

BAF002002 Asphaltic Concrete Core Sample Submission-Field

BAL006001 Asphaltic Concrete Core Testing-Central Lab

Attachments E & F: BAF002002 & BAL006001

All samples shall be marked as Complete (if all results correlate), or Fail (if any test results do not correlate), and authorized upon completion of tests in SiteManager or AASHTOWare Project.

Tensile Strength Ratio Specimens

One Unique Sample ID# for each set of 6 TSR's

2 Templates are:

BAF004001 Asphaltic Concrete Tensile Strength Sample Submission

BAL004001 Asphaltic Concrete Tensile Strength Ratio

Attachments G & H: BAF004001 & BAL004001

Documentation of TSR results to be entered on NDOT Lab Summary Software by Hot Mix Asphalt Design Laboratory in Onbase.

<u>Verification Testing</u> - if contractor runs a Control Strip – all 3 Control Strip samples shall be verified – contractor chooses location within each of the three 200 ton sections. Control Strip must be accepted prior to full production.

If Control Strip is waived, Sublot 1-1 and all sublots identified with an "X" in the FAA/CAA Cold Feed column shall be verified at the indicated tonnage on the Random Sample Schedule (RSS).

Attachment I: Random Sample Schedule

Cold Feed Sampling

Shall be taken to represent the material taken for the HMA sample. Must be taken before the truck with the tonnage shown on the RSS is loaded.

Contractor must take minimum 1 Cold Feed for FAA/CAA testing per lot as identified on RSS.

Contractor may take Cold Feed for FAA/CAA on any other sublots they choose.

<u>Verification Testing</u> – test the same sublot Cold Feed for FAA/CAA as the HMA sample, as indicated on the RSS.

Density Testing

Contractor will choose cores or density gage.

<u>Cores</u> – contractor will test 1 for every sublot plus 1 Joint Density per lot at locations indicated on RSS. Cores shall be properly identified and maintain possession in a climate controlled, secure location after completion of contractor testing.

Verification – 1 per sublot as indicated on RSS, plus 1 Joint Density per lot.

<u>Gage</u> - contractor will cut minimum first 3 cores in first lot and lot 1 Joint Density core, and run gage in same location, as indicated on RSS, for correction factor determination (gage results before cutting cores). Joint Density will have a separate correction factor. Correction factor verification cores will be cut for every 15th density and at the Joint Density in the same lot. <u>Usually cores are cut at 1-1, 1-2, 1-3, 1JD, 4-1, 4JD, 7-1, 7JD, 10-1, 10JD, etc. for verification and gage correlation.</u>

Gage results below 90% are inaccurate and a core must be cut in that location. Core results below 90% shall not be used to establish or verify correction factor.

<u>Verification</u> – If using gage, every core cut shall be verified.

IV QA/QC Lab Verification Testing

Contractor Test Results

Entered on correct version of NDOT Superpave Software and e-mailed to verification testing laboratory and project staff promptly upon completion of tests (Usually daily).

Attachment J: Superpave Software

Verification Laboratory Test Results

Entered on correct version of NDOT Lab Summary Software and e-mailed to contractor and project staff promptly upon completion of tests (Usually the day tests are complete). The NDOT Lab Summary Software is JMF specific and is provided by the NDOT Hot Mix Asphalt Design Laboratory in Onbase in NDOT Mat Material Acceptance Documentation as Test Summary. This document should be filled out in Onbase and updated as a revision, as results are entered.

Attachment K: Lab Summary Software

Test Results

HMA Sample and Cold Feed Correlating Results

All results correlate – contractor's results are used for pay factor determinations.

Density Correlating Results

Contractor's results used for pay factor determination. Verify correction factors are calculated correctly.

HMA Sample and Cold Feed Non-Correlating Results

An Independent Assurance (IA) Review is required for those tests.

Notify contractor and project staff promptly via e-mail.

Attachment L: IA E-mail example

Check and record all contractor's equipment and procedures used to obtain sample and test material.

Test a biased split sample of material to verify results.

Include contractor and verification lab's IA Review results on NDOT Lab Summary Software.

Notify contractor and project staff of findings and test results via e-mail.

Attachment M: Findings E-mail

Upload all correspondence to Onbase.

Testing of additional sublots in that lot may be required. Can seek guidance from NDOT.

If Air Voids or FAA test results do not correlate, the verification lab's results must be used to calculate pay factors. These values will be required to be entered in the appropriate <u>**Red Box**</u> on the contractor's NDOT Superpave Software.

All other non-correlating results will consider the findings of the IA Review and additional sublot test results to determine which results will be used for pay factors on a case by case basis.

Density Non-Correlating Results

Notify contractor and project staff promptly via e-mail.

The core shall be dried and an IA Review performed at the contractor's lab with the core.

Check and record all contractor's equipment and procedures used to obtain sample and test material.

If the contractor's new results correlate with the verification results, those results shall be used for pay factor calculations. If not, the verification lab's results shall be used for pay factor calculations.

Include contractor and verification lab's IA Review results on NDOT Lab Summary Software.

Notify contractor and project staff of findings and test results via e-mail.

Upload all correspondence to Onbase.

Density Re-cuts

Contractor may request re-cuts on any lot or Joint Density with a pay factor less than 1.00.

Re-cuts must be completed by the working day following completion of the lot testing or Joint Density testing.

Lot density re-cuts are all 5 cores in the lot – **gauge not allowed** – and must use all 5 re-cut cores to calculate pay factors. Must be in location as indicated on RSS – distance from edge does not change from original density location.

Joint Density re-cuts must be a core – **gauge not allowed** – and must use the re-cut to calculate pay factor. Must be in location as indicated on RSS – In or Out does not change from original joint density location.

All re-cut cores are verified at verification testing laboratory.

Referee Testing

The contractor may request Referee Testing on any non-correlating result.

Will be performed at NDOT Laboratory if enough material remains in the verification lab's split HMA sample or Cold Feed sample for the sublot with non-correlating results.

V Final Details

Final Lot

HMA samples, Cold Feed Samples, and Joint Densities for mainline or shoulder paving shall be taken at the tonnage indicated on the RSS.

If one or more HMA samples are taken, a minimum of 3 lot density samples are required to calculate lot average density.

The final sublot tonnage may be greater than normal sublot size if the next sample isn't acquired based on the RSS tonnage.

Project Completion

Review contractor's final NDOT Superpave Software to verify:

Everything filled in correctly

All pay factors are calculated correctly

Red Boxes are filled in if necessary

Reported tonnage is correct

Create a SiteManager or AASHTOWare Project Sample ID# and select the correct template for this sample. This is a field authorized sample.

BAF003001 Asphaltic Concrete Final Summary/Pay Factor-Field

Attachment N: BAF003001

Upload the Superpave Software Excel file to Onbase in NDOT Mat Material Acceptance Documentation with the correct Sample ID# as Superpave Software.

NDOT Contacts:

SiteManager/AASHTOWare Project Support

Ty Carlson

Bob Seger

Ndot.awprojectsupport@nebraska.gov

402-479-4760

Quality Assurance Support

Jacob Reynolds **Terry Becker** Hot Mix Asphalt Design Laboratory - Lincoln Omaha Branch Laboratory Jacob.reynolds@nebraska.gov terry.becker@nebraska.gov 531-249-8692 402-805-7236 Dennis Osterman Jerry Isom Grand Island Branch Laboratory North Platte Branch Laboratory dennis.osterman@nebraska.gov jerry.isom@nebraska.gov 308-379-8596 308-530-4010

Brandon Remm

Norfolk Branch Laboratory

brandon.remm@nebraska.gov

402-649-2304

Resources

Standard Specifications for Highway Construction Sections 500, 1028, 1080, 1081, and 1082

Material Sampling Guide

Sections 2, 3, 4, and 28

State of Nebraska	CONTRACTOR MIX	DESIGN SUBMITTAL FORM	
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Materials and Research Division			
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Attachments - A





Attachments - C & D

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Attachments - C

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Attachments - E & F

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Attachments - G & H

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Attachments - I NEBRASKA DEPARTMENT OF ROADS Asphaltic Concrete Pavement Random Sampling Schedule

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Attachments - I

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Attachments - J

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Attachments - J



Attachments - J



Attachments - K NEBRASKA NEBRASKA DEPARTMENT OF TRANSPORTATION INITIAL JOB MIX FORMULA - NOV 2020 LETTING d Life. Gr eat Jo GOOD LITE. GREAT JOURNE PROACT MUMBER: NAME OF ROAD: CONTRACTOR: CONTRACTOR: TEST LOCATION: PROJECT MUMADAGER: DATE RECEIVED: MAR CIFIC GRAVITY OF A SPECIFIC GRAVITY DATE TESTED: Version 2021-2.1 S CM burnel SHAbmoff SHA N CUA Cold Feed Dersh Broke NVbibi (INVes for (firm) ktio Rtio NVA % FAA Cold Fe No. 200 **Binder** S VFA No. 50 Mix Design Targets 3/5 25 Contractor's Targets Grad. Sample Witz Sirve Witz Witz 1° 3.4° 1.2° 3.18° 3.4 4 4.6 4 4.50 4 4.50 4 4.50 4 4.50 4 4.50 4 4.50 4 Gyratory Bulk Gravity Maximum Mix Gravity Fine Age gaie Angularity (FAA) Burn-off Cold Feed 76 Ret. 76 Pass Cont. and Mix wt. Container in air Mix in air Cont./Mix in water Container in water Mix in water Mix in water Mix Volume Wt. Air Cylinder Volume Cylinder Weight Specific Gravity Cyl. & Agg. Wt. #1 Cyl. & Agg. Wt. #2 Average FAA 0.0 Wt. 55D -0art Ar Wt. Water 0 Volume Aggregate Ang Burn-off Wt. 74 (CAA) Cold Feed dan Sample Wt. 1 fractured face 2 fractured face Gmm Gmb D/B %VMA %VFA Gradation Chart VE SIZES RAISED TO .45 POWER Burn-Off Oven Results Calibrated Binder Content Correction Factor Total Binder Content Ht., mm Gmb *sGmm %Air Voids From Ticket N des -Aggregate Properties lat and Elongated Particles Sand Equivalent arks: 000 2 0 s10 #8 SEIVE SIZES Page 1 Software Legal Disclaimer: The Nebraska Departm completeness, the merchantability or fitness for a po-mination of any addigation assumed by the contract rement of substitute goods or services; kas of one. sre, but NDOT expressly disclaims warranty of any type for such informa with information against deficiencies of any type or nature. The use of su he contrast, NDOT shall not be reasonable for any direct, indirect, i

Attachments - K



Attachments - K



Attachments - L

Letter for an IA Review

Contractor X,

The Lot 2-4 aggregate gradation results do not correlate with the branch lab's results on the ½" and #4 sieves. Please have your technician check the equipment used for this test. An IA review will be scheduled on a biased sample today or tomorrow. The remaining split samples from Lot 2 will be delivered to the branch lab for possible testing.

Thank you,

Quality Assurance Manager State Branch Lab

Attachments - M



Attachments - N

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