

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

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

Binder – 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

Acceptance Testing – contractor will sample and test all Control Strip samples, unless waived, and all subplot 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 subplot 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 subplot 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.

Verification Testing - 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.

Verification Testing – 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.

Cores – 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.

Gage - 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. 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.

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.

Verification – 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 **Red Box** on the contractor's NDOT Superpave Software.

All other non-correlating results will consider the findings of the IA Review and additional subplot 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 subplot 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 subplot tonnage may be greater than normal subplot 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

Jody Paul

Hot Mix Asphalt Design Laboratory – Lincoln

Jody.Paul@nebraska.gov

402-479-3851

Terry Becker

Omaha Branch Laboratory

Terry.Becker@nebraska.gov

402-805-7236

Calvin Splattstoesser

Grand Island Branch Laboratory

Cal.Splattstoesser@nebraska.gov

308-379-8596

Jerry Isom

North Platte Branch Laboratory

Jerry.Isom@nebraska.gov

308-530-4010

Brandon Remm

Norfolk Branch Laboratory

Brandon.Remm@nebraska.gov

402-649-2304

Amanda Shinkle

District 1 Quality Assurance

Amanda.Shinkle@nebraska.gov

402-499-1638

Resources

Standard Specifications for Highway Construction

Sections 500, 1028, 1080, 1081, and 1082

Material Sampling Guide

Sections 2, 3, 4, and 28

Attachments - B

State of Nebraska
Department of Transportation
Asphalt Concrete Bridge

Project Manager: _____
Project No: _____
Year of Road: _____
Type of Asphalt Concrete: _____
Design No: _____

Zone: _____
APPROVAL NUMBER: _____
Sheet: _____
Grade: _____

| QUANTITY OF MATERIALS | | VOLUME ANALYSIS OF AGG. | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------------------|----------|----|------|--------|--------|--------|--------|--------|--------|--------|---------|--------|---------|---------|---------|---------|----------|----------|----------|----------|-----------|---------|---------|
| ITEM NO. | DESCRIPTION | UNIT | LOCATION | BY | DATE | S. 1/4 | S. 2/4 | S. 3/4 | S. 4/4 | S. 1/2 | S. 3/8 | S. 1/4 | S. 3/16 | S. 1/8 | S. 1/16 | S. 3/32 | S. 1/32 | S. 1/64 | S. 3/128 | S. 1/128 | S. 1/256 | S. 1/512 | S. 1/1024 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | PERCENT | PERCENT |
| 1 | 100% | | | | | | | | | | | | | | | | | | | | | | | | |
| COMBINED GRADATION | | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| SPECIAL REQUIREMENTS | | | | | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

| JOB DELIVERY QUANTITIES | |
|-------------------------|--|
| Job No. | |
| Year of Road | |
| Design No. | |

| TESTING PROPERTIES | | LAB NO. |
|--------------------|--|---------|
| Job No. | | |
| Year of Road | | |
| Design No. | | |

Notes: 1. Test type - asphalt binder for a total of _____ lbs. of material has been selected by the contractor to be the target asphalt binder content.

This contractor's verification of the job mix, gradation and aggregate content is to be prepared by the contractor. If it is necessary to change the job mix either before or after the job starts, including the asphalt binder %, the contractor shall notify the P.E. - DTM.

REMARKS:

Andy Thomas
District Engineer

Checked by: Robert C. Black, District Engineer

Per: _____

Attachments - C & D

Maintain Sample Information

Basic Sample Data Add Sample Data Contract District Tests

Assign Sample Tests

Sample ID: 21321480V00 Sample Type: Material Code: 50340101

| Additional Available Tests | | | Tests to be Assigned | | | |
|--|------------------------|----|---|------------------------|-------------|-----------------|
| Test Description | Lab No. | U | Test Description | Lab Name | Test Method | Sample Test No. |
| Asphaltic Concrete Core Sample Submission - Field | Field (Notok) | 1 | Asphaltic Concrete Sample Submission - Field | Field (Notok) | BAF/001003 | 1 |
| Asphaltic Concrete Core Testing - Central Lab | INDOT Notok Branch Lab | 1P | Asphaltic Concrete Quality Assurance - Central INDOT Notok Branch Lab | INDOT Notok Branch Lab | BAQ/003001 | 1 |
| Field Quantities of Non-Critical Materials - Field | Field (Notok) | 1P | | | | |
| Pit Room Not Listed Submission | Field (Notok) | 1P | | | | |

Buttons: Add -> <- Remove

Buttons: Save Tests Cancel Add Test Runs Delete Test Runs

Attachments - C

Material Test

Sample ID : 2133149MVOID Test Method : BAF001003 Test Number : 1
Material Code : 503A0101
Effective Date: 01/01/17 You can resize the window below by dragging the corners.
The new size will be remembered the next time you login.

Asphaltic Concrete Quality Assurance Field Submission
Field Performed Test

NDOT M&R Template ID: BAF001003
Robert C. Rea, Flexible Pavement Engineer Version: 20190819

Technicians identified herein are responsible for the completed testing on the line items indicated on the Contract tab.
* Acceptance Testing Technician: Contractor personnel who conducted the acceptance testing for this lot.

Station + Offset LI/RT of Center
Lot No. Sub Lot No. Tonnage
Acceptance Testing Technician *

** Test result data and information can be found in OnBase. **

Attachments - D

Material Test T

Sample ID : 2133149MVOID Test Method : BAL003001 Test Number : 1
Material Code : 503A0101
Effective Date: 01/01/17 You can resize the window below by dragging the corners.
The new size will be remembered the next time you login.

Asphaltic Concrete Quality Assurance
Laboratory Performed Test

NDOT M&R Template ID: BAL003001
Robert C. Rea, Flexible Pavement Engineer Version: 20190409

Technicians identified herein are responsible for the completed testing on the line items indicated on the Contract tab.
** Verification Testing Technician: NDOT Central or Branch Lab personnel who conducted the verification testing for this project.

Verification Testing Technician **

** Test result data and information can be found in OnBase. **

Attachments - E & F

Assign Sample Tests

Sample ID: 2133149DV010 | Sample Type: | Material Code: 503A0101

| Additional Available Tests | | | Tests to be Assigned | | | |
|--|-----------------|----|--|-------------------------|-------------|-----------------|
| Test Description | Lab Nm | Ti | Test Description | Lab Name | Test Method | Sample Test Nbr |
| Asphaltic Concrete Sample Submission - Field | | 04 | Asphaltic Concrete Core Sample Submission - Fi Field (Norfolk) | | BAF002002 | 1 |
| Asphaltic Concrete Quality Assurance - Central Lab | | 01 | Asphaltic Concrete Core Testing - Central Lab | N001 Norfolk Branch Lab | BAL006001 | 1 |
| Small Quantities of Non-Critical Materials - Field | Field (Norfolk) | 01 | | | | |
| Person Not Listed Submission | Field (Norfolk) | 01 | | | | |

Buttons: Add -> | < Remove

Bottom Buttons: Save Tests | Cancel | Add Test Runs | Delete Test Runs



Attachments - F

Material Test Ter

Sample ID : 21331492VOID Test Method : BAL006001 Test Number: 1

Material Code : 503A0101

Effective Date: 01/01/17

You can resize the window below by dragging the corners.
The new size will be remembered the next time you login.

Asphaltic Concrete Core Testing
Laboratory Performed Test

NDOR M&R
Robert C. Rea, Flexible Pavement Engineer

Template ID: BAL006001
Version: 20170330

**** Laboratory summary test data and information can be found in OnBase. ****

Attachments - E

Material Test

Sample ID : 21331492VOID Test Method : BAF002002 Test Number: 1

Material Code : 503A0101

Effective Date: 01/01/17

You can resize the window below by dragging the corners.
The new size will be remembered the next time you login.

Asphaltic Concrete Core Sample Submission
Field Performed Test

NDOR M&R
Robert C. Rea, Flexible Pavement Engineer

Template ID: BAF002002
Version: 20180306

Station + Offset Lt/Rt of Center

Lot No. Sub Lot No. Joint Density

Attachments – G & H

Assign Sample Tests

Sample ID: 21331493V01D Sample Type: Material Code: 503A0101

| Additional Available Tests | | | Tests to be Assigned | | | |
|--|-------------------------------|----|--|-------------------------------|-------------|-----------------|
| Test Description | Lab Nm | Ti | Test Description | Lab Name | Test Method | Sample Test Nbr |
| Asphaltic Concrete Sample Submission - Field | Field (Central) | B/ | Asphaltic Concrete Tensile Strength Ratio Samp | Field (Central) | BAF004001 | 1 |
| Asphaltic Concrete Core Sample Submission - Field | Field (Central) | B/ | Asphaltic Concrete Tensile Strength Ratio - Cent | NDOT Bituminous Aggregate Lab | BAF004001 | 1 |
| Asphaltic Concrete Final Summary/Pay Factors - Field | Field (Central) | B/ | | | | |
| Asphaltic Concrete Mix Design - Central Lab | NDOT Bituminous Aggregate Lab | B/ | | | | |
| Asphaltic Concrete Quality Assurance - Central Lab | NDOT Bituminous Aggregate Lab | B/ | | | | |
| Asphaltic Concrete Test Summary - Central Lab | NDOT Bituminous Aggregate Lab | B/ | | | | |
| Asphaltic Concrete Core Testing - Central Lab | NDOT Bituminous Aggregate Lab | B/ | | | | |
| Small Quantities of Non-Critical Materials - Field | Field (Central) | M/ | | | | |
| Person Not Listed Submission | Field (Central) | M/ | | | | |
| Documentation - Materials and Research Use Only - Cent | NDOT Bituminous Aggregate Lab | M/ | | | | |

Buttons: Save Tests, Cancel, Add Test Runs, Delete Test Runs

Attachments - G

Material Test

Sample ID: 21331493V01D Test Method: BAF004001 Test Number: 1

Material Code: 503A0101

Effective Date: 01/01/17

You can resize the window below by dragging the corners. The new size will be remembered the next time you login.

Asphaltic Concrete Tensile Strength Ratio Sample Submission

Field Performed Test

NDOR M&R
Robert C. Rea, Flexible Pavement Engineer

Template ID: BAF004001
Version: 20170406

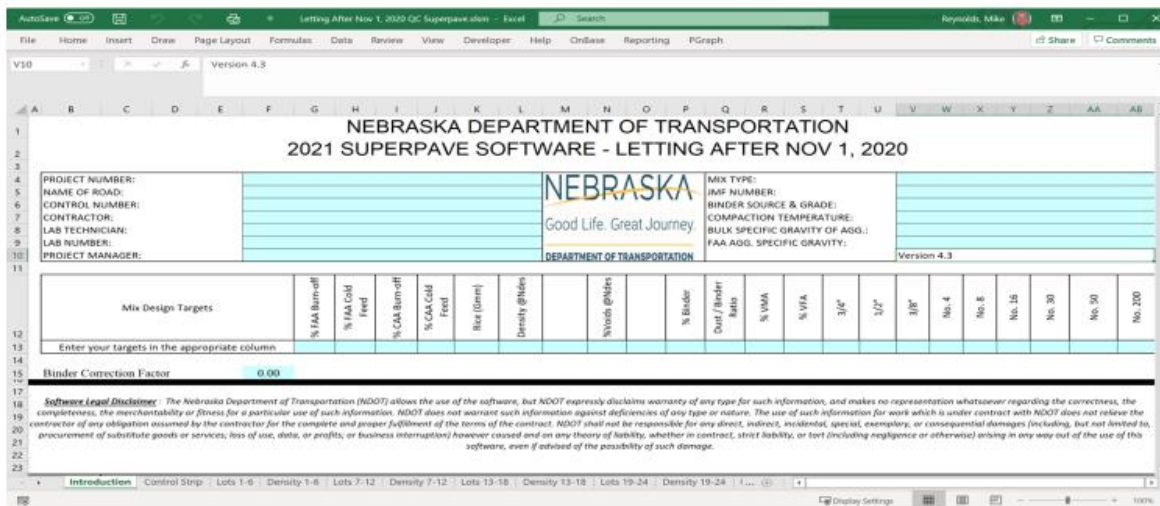
Lot No. Sub Lot No. Tonnage

Template Incomplete

Attachments - I

| | | Asphaltic | | | | | | | | | | | | | | | | | |
|-------------|---------------|-------------------|------|--------------------|--------------------|-----------------------|--------------------|------------------|--------------------|---------|------------------|---------------|----------------|-----|--|--|--|--|--|
| Project No: | | STP-59-6(101) | | | | Name of Road: | | | | | | | | | | | | | |
| Control No. | | 32126 | | | | Asphalt Weight: 32000 | | | | | | | | | | | | | |
| | | 8 ft | | 12 ft | | 14 ft | | 0 ft | | | | | | | | | | | |
| Lot Number | Sublot Number | Ton to be Sampled | | Distance from Edge | Distance from Edge | Distance from Edge | Distance from Edge | Distance to Core | FAA/ CAA Cold Feed | Recuts: | Distance to Core | Field Density | Joint Density* | TSR | | | | | |
| | | Lot | PJT | | | | | | | | | | | | | | | | |
| 1 | 1 | 505 | 505 | 8 | 5 | 10 | 0 | -47 | | | -35 | | | IN | | | | | |
| 1 | 2 | 1425 | 1425 | 3 | 7 | 0 | 0 | 51 | | | -68 | | | | | | | | |
| 1 | 3 | 2401 | 2401 | 7 | 0 | 13 | 0 | -59 | X | | -27 | X | | X | | | | | |
| 1 | 4 | 3204 | 3204 | 5 | 10 | 5 | 0 | 94 | | | 68 | | | | | | | | |
| 1 | 5 | 4788 | 4788 | 2 | 6 | 11 | 0 | -80 | | | -8 | | | | | | | | |
| 2 | 1 | 496 | 5496 | 6 | 11 | 7 | 0 | 67 | | | 34 | | | OUT | | | | | |
| 2 | 2 | 1680 | 6680 | 5 | 6 | 9 | 0 | -40 | | | 93 | | | | | | | | |
| 2 | 3 | 2139 | 7139 | 3 | 9 | 5 | 0 | -41 | | | -54 | | | | | | | | |
| 2 | 4 | 3916 | 8916 | 6 | 9 | 1 | 0 | -96 | | | -78 | | | | | | | | |
| 2 | 5 | 4566 | 9566 | 2 | 2 | 8 | 0 | -42 | X | | -82 | X | | | | | | | |

Attachments - J



NEBRASKA DEPARTMENT OF TRANSPORTATION
2021 SUPERPAVE SOFTWARE - LETTING AFTER NOV 1, 2020

PROJECT NUMBER:
NAME OF ROAD:
CONTROL NUMBER:
CONTRACTOR:
LAB TECHNICIAN:
LAB NUMBER:
PROJECT MANAGER:

NEBRASKA
Good Life. Great Journey
DEPARTMENT OF TRANSPORTATION

MIX TYPE:
IMF NUMBER:
BINDER SOURCE & GRADE:
COMPACTION TEMPERATURE:
BULK SPECIFIC GRAVITY OF AGG.:
FAA AGG. SPECIFIC GRAVITY:

Version 4.3

Mix Design Targets

| | | | | | | | | | | | | | | | |
|--|-----------------|--------------|--------------|----------|-------|-------|------|------|------|-------|-------|--------|--------|--------|---------|
| % FAA Cold Feed | % CAA Cold Feed | Rice (Green) | Density @Hds | % Binder | % VMA | % VFA | 3/4" | 1/2" | 3/8" | No. 4 | No. 8 | No. 16 | No. 30 | No. 60 | No. 200 |
| Enter your targets in the appropriate column | | | | | | | | | | | | | | | |

Binder Correction Factor: 0.00

Software Legal Disclaimer: The Nebraska Department of Transportation (NDOT) allows the use of the software, but NDOT expressly disclaims warranty of any type for such information, and makes no representation whatsoever regarding the correctness, the completeness, the merchantability or fitness for a particular use of such information. NDOT does not warrant such information against deficiencies of any type or nature. The use of such information for work which is under contract with NDOT does not relieve the contractor of any obligation assumed by the contractor for the complete and proper fulfillment of the terms of the contract. NDOT shall not be responsible for any direct, indirect, incidental, special, exemplary, or consequential damages including, but not limited to, procurement of substitute goods or services, loss of use, data, or profits, or business interruption, however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of the use of this software, even if advised of the possibility of such damage.

Attachments - J

Letting After Nov 1, 2020 QC Superpave.xlsx

NEBRASKA DEPARTMENT OF TRANSPORTATION
SUPERPAVE SOFTWARE CONTROL STRIP

NEBRASKA
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DEPARTMENT OF TRANSPORTATION

MIX TYPE:
JM# NUMBER:
BINDER SOURCE & GRADE:
COMPACTION TEMPERATURE:
BULK SPECIFIC GRAVITY OF AGG.:
FAA AGG. SPECIFIC GRAVITY:

| SAMPLE ID | DATE / LOCATION | | | MIX VOLUMETRICS AND PROPERTIES | | | | | | | | | | GRADATION (Percent Passing) | | | | | | | | | | |
|-----------|-----------------|------|-------------------|--------------------------------|----------------|---------------|----------------|-----------|--------------|--------|---------|-------------------|------|-----------------------------|------|------|------|-------|-------|--------|--------|--------|---------|------|
| | JM# | Date | Station/Lift/Lane | %FAA Burn-off | %FAA Cold Feed | %CAA Burn-off | %CAA Cold Feed | Rise (mm) | Density @14% | %Woods | %Binder | Dust/Binder Ratio | %VMA | %VFA | 3/8" | 1/2" | 3/4" | No. 4 | No. 8 | No. 15 | No. 30 | No. 50 | No. 200 | |
| CS-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| CS-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| CS-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| | #N/A | | | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| | #N/A | | | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |

Lab Calculations Control Strip 1

Page 1

Attachments - J

NEBRASKA DEPARTMENT OF TRANSPORTATION
SUPERPAVE SOFTWARE LOTS 1-6 SUMMARY

NEBRASKA
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DEPARTMENT OF TRANSPORTATION

MIX TYPE:
JM# NUMBER:
BINDER SOURCE & GRADE:
COMPACTION TEMPERATURE:
BULK SPECIFIC GRAVITY OF AGG.:
FAA AGG. SPECIFIC GRAVITY:

| SAMPLE ID | DATE / LOCATION | | | MIX VOLUMETRICS AND PROPERTIES | | | | | | | | | | GRADATION (Percent Passing) | | | | | | | | | | |
|------------|-----------------|------|-------------------|--------------------------------|----------------|---------------|----------------|-----------|--------------|--------|---------|-------------------|------|-----------------------------|------|------|------|-------|-------|--------|--------|--------|---------|------|
| | JM# | Date | Station/Lift/Lane | %FAA Burn-off | %FAA Cold Feed | %CAA Burn-off | %CAA Cold Feed | Rise (mm) | Density @14% | %Woods | %Binder | Dust/Binder Ratio | %VMA | %VFA | 3/8" | 1/2" | 3/4" | No. 4 | No. 8 | No. 15 | No. 30 | No. 50 | No. 200 | |
| Sublot 1-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 1-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 1-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 1-4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 1-5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 2-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 2-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 2-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 2-4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 2-5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 3-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 3-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 3-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 3-4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 3-5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 4-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 4-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 4-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 4-4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 4-5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 5-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 5-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 5-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 5-4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 5-5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 6-1 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 6-2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 6-3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 6-4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sublot 6-5 | | | | | | | | | | | | | | | | | | | | | | | | |
| | #N/A | | | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| | #N/A | | | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |

ASHTO T30, T166, T209, T245, T269, T304, T308, T383, T312, D5821
*All Specifications are minimums, except for Air Voids and Gradations

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Attachments - J

Lab Calculations 1-1

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER: _____ MIX TYPE: _____
 NAME OF ROAD: _____ BINDER SOURCE & GRADE: _____
 CONTROL NUMBER: _____ COMPACTION TEMPERATURE: _____
 CONTRACTOR: _____ BULK SPECIFIC GRAVITY OF AGG.: _____
 LAB TECHNICIAN: _____ FAA AGG. SPECIFIC GRAVITY: _____
 LAB NUMBER: _____ LIST: _____
 STATION NUMBER: _____ DATE: _____ DEPARTMENT OF TRANSPORTATION LANE: _____

| | | | | | | | |
|---|--|--|--|---|--|--|--|
| Gyratory Bulk Gravity Wt. Air _____ Wt. SSD _____ Wt. Water _____ Volume _____ Gmb _____ | | Maximum Mix Gravity Cont. and Mix wt. _____ Container in air _____ Mix in air _____ Cont./Mix in water _____ Container in water _____ Mix in water _____ Mix Volume _____ Gmm _____ | | Fine Aggregate Angularity (FAA) Cylinder Volume _____ Cylinder Weight _____ Specific Gravity _____ Cyl. & Agg. Wt. #1 _____ Cyl. & Agg. Wt. #2 _____ Average FAA _____ | | Grad. Sample Wt. Sieve Wt., gm % Ret. % Pass. 1" _____ 3/4" _____ 1/2" _____ 3/8" _____ #4 _____ #8 _____ #16 _____ #30 _____ #50 _____ #100 _____ #200 _____ | |
| Gmm _____ Gmb _____ D/B _____ %VMA _____ %VFA _____ Ht., mm _____ Gmb _____ %Gmm _____ %Air Voids _____ N des = _____ | | Burn-Off Oven Results Calibrated Binder Content _____ From Ticket _____ Correction Factor _____ Total Binder Content _____ | | Gradation Chart SIEVE SIZES RAISED TO .45 POWER | | | |

NDOT Air Void Results: _____
NDOT Binder Results: _____
NDOT Dust/Binder Results: _____
NDOT FAA Results: _____
NDOT FAA Results: _____

Remarks: _____

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Attachments - K

NEBRASKA
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DEPARTMENT OF TRANSPORTATION

NEBRASKA DEPARTMENT OF TRANSPORTATION
INITIAL JOB MIX FORMULA - NOV 2020 LETTING

MAR

PROJECT NUMBER: _____ MIX TYPE: _____
 NAME OF ROAD: _____ BINDER SOURCE & GRADE: _____
 CONTROL NUMBER: _____ COMPACTION TEMPERATURE: _____
 CONTRACTOR: _____ BULK SPECIFIC GRAVITY OF AGG.: _____
 TEST LOCATION: _____ FAA AGG. SPECIFIC GRAVITY: _____
 PROJECT MANAGER: _____
 DATE RECEIVED: _____

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|---|--|--|--|
| Mix Design Targets VMA (Des) _____ VMA (Min) _____ VMA (Max) _____ VMA (Adj) _____ Range (mm) _____ Density (Des) _____ | | Contractor's Targets VMA (Des) _____ VMA (Min) _____ VMA (Max) _____ VMA (Adj) _____ Range (mm) _____ Density (Des) _____ | | Gyratory Bulk Gravity Wt. Air _____ Wt. SSD _____ Wt. Water _____ Volume _____ Gmb _____ | | Maximum Mix Gravity Cont. and Mix wt. _____ Container in air _____ Mix in air _____ Cont./Mix in water _____ Container in water _____ Mix in water _____ Mix Volume _____ Gmm _____ | | Fine Aggregate Angularity (FAA) Cylinder Volume _____ Cylinder Weight _____ Specific Gravity _____ Cyl. & Agg. Wt. #1 _____ Cyl. & Agg. Wt. #2 _____ Average FAA _____ | | Grad. Sample Wt. Sieve Wt., gm % Ret. % Pass. 1" _____ 3/4" _____ 1/2" _____ 3/8" _____ #4 _____ #8 _____ #16 _____ #30 _____ #50 _____ #100 _____ #200 _____ | |
| Gmm _____ Gmb _____ D/B _____ %VMA _____ %VFA _____ Ht., mm _____ Gmb _____ %Gmm _____ %Air Voids _____ N des = _____ | | Burn-Off Oven Results Calibrated Binder Content _____ From Ticket _____ Correction Factor _____ Total Binder Content _____ | | Aggregate Properties Flat and Elongated Particles _____ Sand Equivalent _____ | | Gradation Chart SIEVE SIZES RAISED TO .45 POWER | | | | | |

Remarks: _____

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Attachments - K

NEBRASKA
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 NEBRASKA DEPARTMENT OF TRANSPORTATION

**NEBRASKA DEPARTMENT OF TRANSPORTATION
 ASPHALTIC CONCRETE LAB TESTS 1-14**

PROJECT NUMBER: _____
 NAME OF ROAD: _____
 CONTROL NUMBER: _____
 CONTRACTOR: _____
 LAB TECHNICIAN: _____
 TEST LOCATION: _____
 PROJECT MANAGER: _____



MIX TYPE: _____
 JMF NUMBER: _____
 BINDER SOURCE & GRADE: _____
 COMPACTION TEMPERATURE: _____
 BULK SPECIFIC GRAVITY OF AGG.: _____
 FAA AGG. SPECIFIC GRAVITY: _____
 YEAR: _____

| SAMPLE ID | | DATE / LOCATION | | Production Tensile Strength Ratio - Lot | | Production Tensile Strength Ratio - Lot | | Production Tensile Strength Ratio - Lot | | GRADATION (Percent Passing) | |
|---------------|-----------------|-------------------------|-----------------------------|---|-----------|---|-----------|---|-----------|-----------------------------|-----------|
| Sample Number | LAB # / Field # | Date Received / Sampled | S-M Number / Sta./Lift/Lane | MAA / %OA | MMA / %OA | MAA / %OA | MMA / %OA | MAA / %OA | MMA / %OA | MAA / %OA | MMA / %OA |
| Contractor | | | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| Contractor | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |


AASHTO T30, T166, T209, T245, T269, T304, T308, T283, T332, D5821
*All Specifications are minimums, except for Air Voids and Gradations.

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Attachments - K

LAB TEST 1

PROJECT NUMBER: _____
 NAME OF ROAD: _____
 CONTROL NUMBER: _____
 CONTRACTOR: _____
 LAB TECHNICIAN: _____
 LAB ID #: _____
 DATE RECEIVED: _____



MIX TYPE: _____
 JMF NUMBER: _____
 BINDER SOURCE & GRADE: _____
 COMPACTION TEMPERATURE: _____
 BULK SPECIFIC GRAVITY OF AGG.: _____
 FAA AGG. SPECIFIC GRAVITY: _____
 S-M NUMBER: _____

SUBLOT: _____

| <p>Gyratory Bulk Gravity</p> <p>Wt. Air _____ Wt. SSD _____ Wt. Water _____ Volume _____ Gmb _____</p> | <p>Maximum Mix Gravity</p> <p>Cont. and Mix wt. _____ Container in air _____ Mix in air _____ Cont./Mix in water _____ Container in water _____ Mix in water _____ Mix Volume _____ Gmm _____</p> | <p>Fine Aggregate Angularity (FAA)</p> <p>Cylinder Volume _____ Cylinder Weight _____ Specific Gravity _____ Cyl. & Agg. Wt. #1 _____ Cyl. & Agg. Wt. #2 _____ Average FAA _____</p> | <p>Grad. Sample Wt.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sieve</th> <th>Wt. gm</th> <th>% Ret.</th> <th>% Pass.</th> </tr> </thead> <tbody> <tr><td>1"</td><td></td><td></td><td></td></tr> <tr><td>3/4"</td><td></td><td></td><td></td></tr> <tr><td>1/2"</td><td></td><td></td><td></td></tr> <tr><td>3/8"</td><td></td><td></td><td></td></tr> <tr><td># 8</td><td></td><td></td><td></td></tr> <tr><td># 16</td><td></td><td></td><td></td></tr> <tr><td># 30</td><td></td><td></td><td></td></tr> <tr><td># 50</td><td></td><td></td><td></td></tr> <tr><td># 100</td><td></td><td></td><td></td></tr> <tr><td># 200</td><td></td><td></td><td></td></tr> </tbody> </table> | Sieve | Wt. gm | % Ret. | % Pass. | 1" | | | | 3/4" | | | | 1/2" | | | | 3/8" | | | | # 8 | | | | # 16 | | | | # 30 | | | | # 50 | | | | # 100 | | | | # 200 | | | |
|---|---|--|--|-------|--------|--------|---------|----|--|--|--|------|--|--|--|------|--|--|--|------|--|--|--|-----|--|--|--|------|--|--|--|------|--|--|--|------|--|--|--|-------|--|--|--|-------|--|--|--|
| Sieve | Wt. gm | % Ret. | % Pass. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/8" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| # 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| # 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| # 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| # 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| # 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| # 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

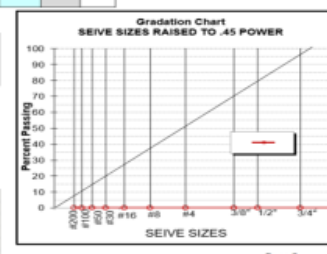
Burn-off Oven Results

Calibrated Binder Content _____ From Ticket
 Correction Factor _____
 Total Binder Content _____

Burn-Off Oven Weights

| | |
|-------------------|--|
| Empty Basket | |
| Full Basket | |
| Weight of Sample | |
| Weigh Back Weight | |

Gradation Chart
 SEIVE SIZES RAISED TO .45 POWER



Contractor required to use these results.
 NDOT Air Void Results: _____
 NDOT Binder Results: _____
 NDOT Dust/Binder Results: _____
 NDOT FAA Results: _____
 NDOT FAA Results: _____

Remarks: _____

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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 1/2" 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

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Attachments - M

Follow-up Letter

Contractor X,

I performed an IA review on the splitting, washing and sieving in the lab located north of Fremont on 10-21-10. **A #10 or #16 cover sieve is needed for the wash test.** I couldn't find any other issues with the equipment or technicians techniques. The IA sample and subsequent samples are within testing tolerances for gradations.

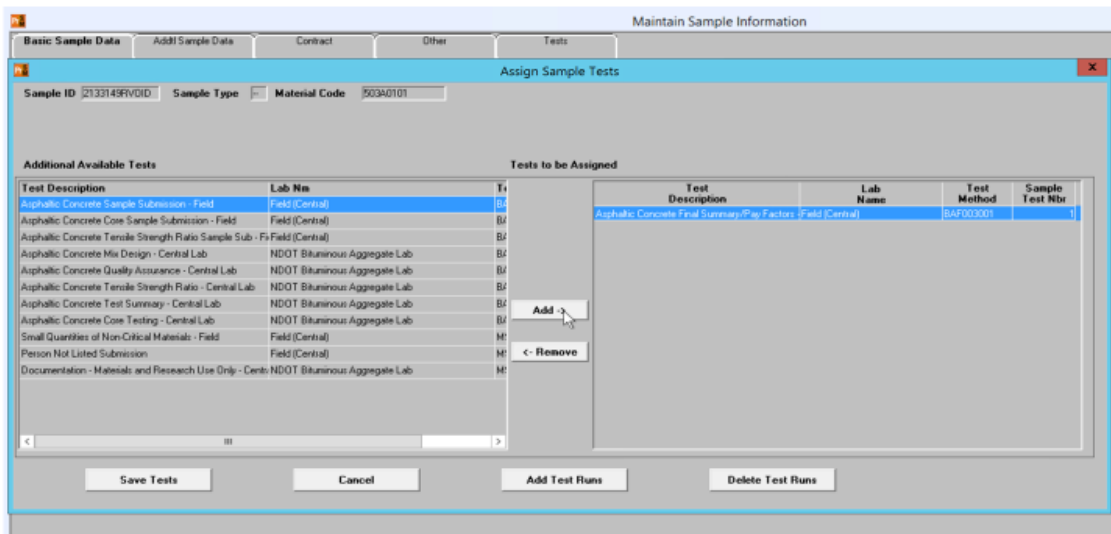
The Norfolk Branch Lab air voids for sample 3-2 do not correlate with your technicians results. Be advised the Norfolk Branch Lab results shall be used for single test results and when calculating running average of 4 tests for air voids. I will request the remaining split samples from lot 3 be delivered to the branch lab for testing. I plan to be at this lab tomorrow for IA review of equipment and procedures related to the RICE test and gyratory compaction.

Thank you,

Quality Assurance Manager
State Branch Lab

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Attachments - N



Attachments - N

