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 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.

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 15^{th} 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 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

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Bob Seger

Ndot.awprojectsupport@nebraska.gov

402-479-4760

Quality Assurance Support

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Brandon Remm

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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

Attachments

Attachments - A

State of Nebraska
Department of Transportation
Materials and Research Division

CONTRACTOR MIX DESIGN SUBMITTAL FORM

NEBRASKA DEPARTMENT OF TRANSPORTATION

Form must be filled out completely

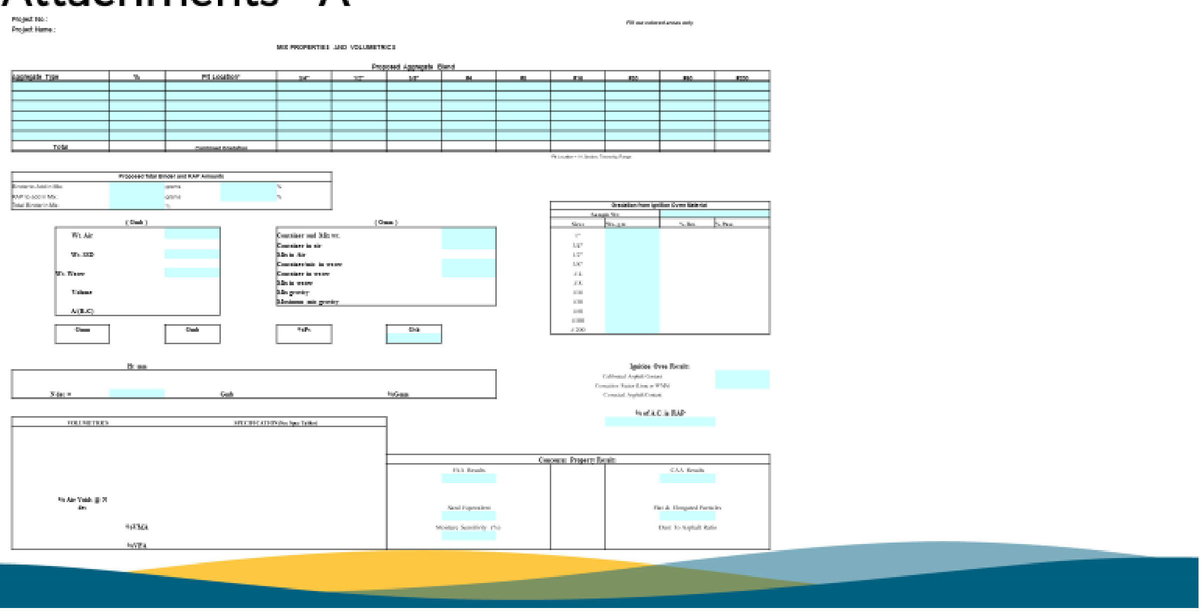
Project No.:		**Mix Type:**	
Project Name.:		**Grading Band:**	
Control No.:		**Binder Type:**	
Contractor:		**Binder Grade:**	
		Compaction Temperature:	

Comments:

Tested by:	
Submitted by:	
Phone No.:	
Fax No.:	
Date:	

Note: These submittal sheets shall be the first two pages of the submittal package for mix design verification. Attached to these sheets will be your lab worksheets for at least the 4 point design and all other pertinent design information.

Attachments - A



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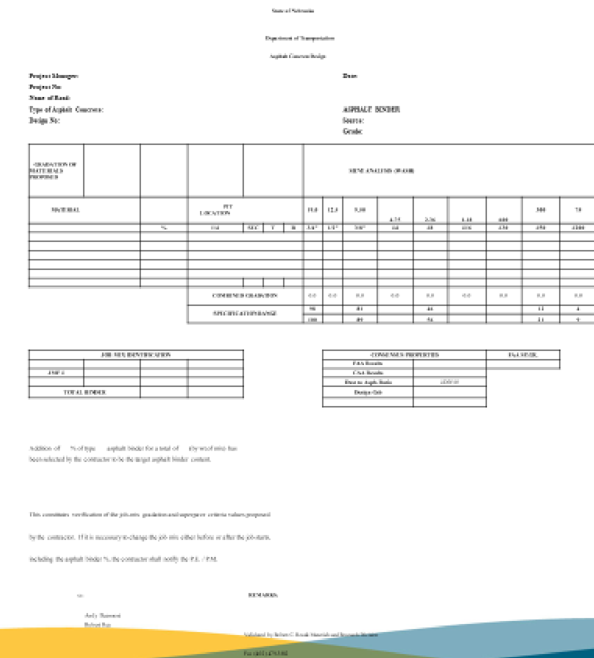


State of Nebraska

Department of Transportation

Asphalt Concrete Design

Project Manager: Date:

Project No:

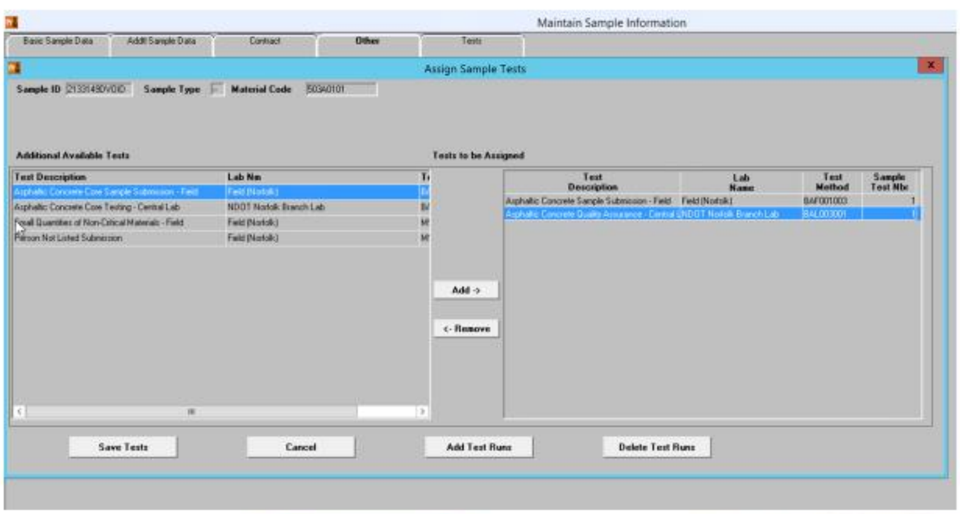
Name of Road:

Type of Asphalt Concrete: ASPHALT BINDER

Design No: Source:

Grade:

Attachments – C & D



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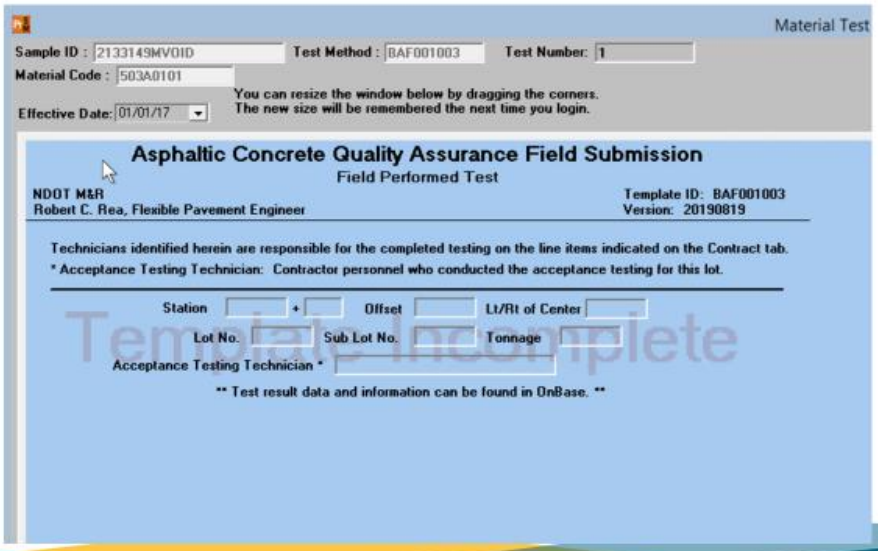

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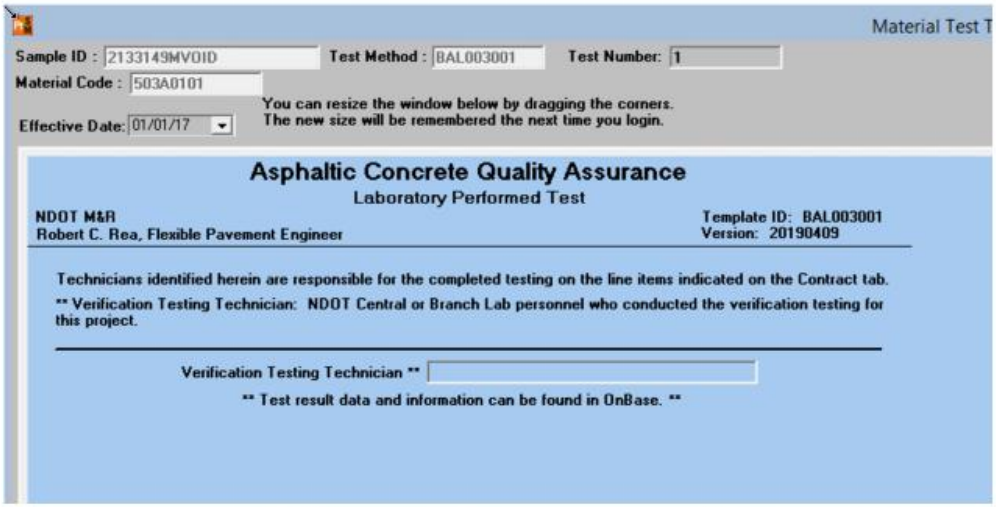

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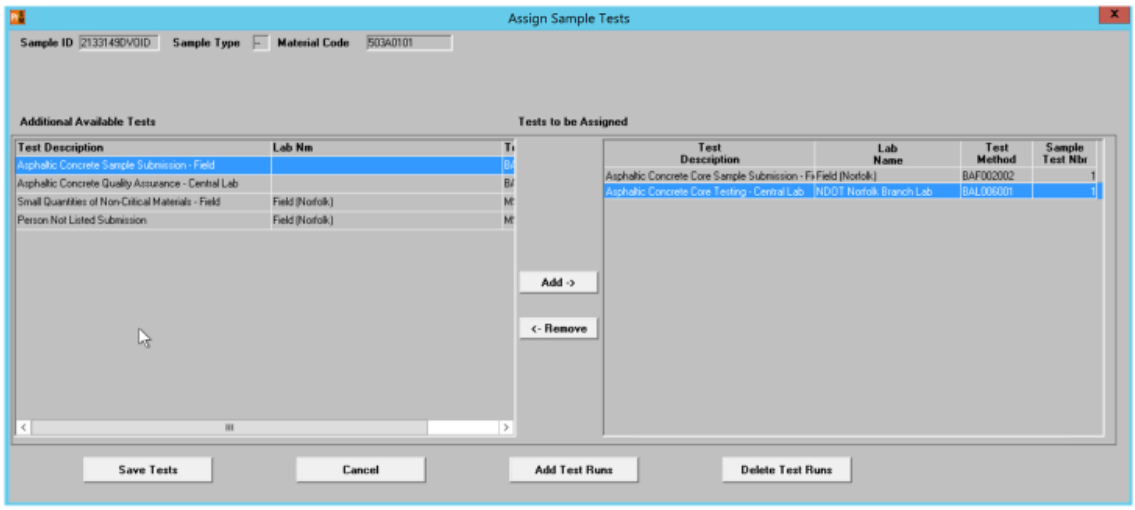

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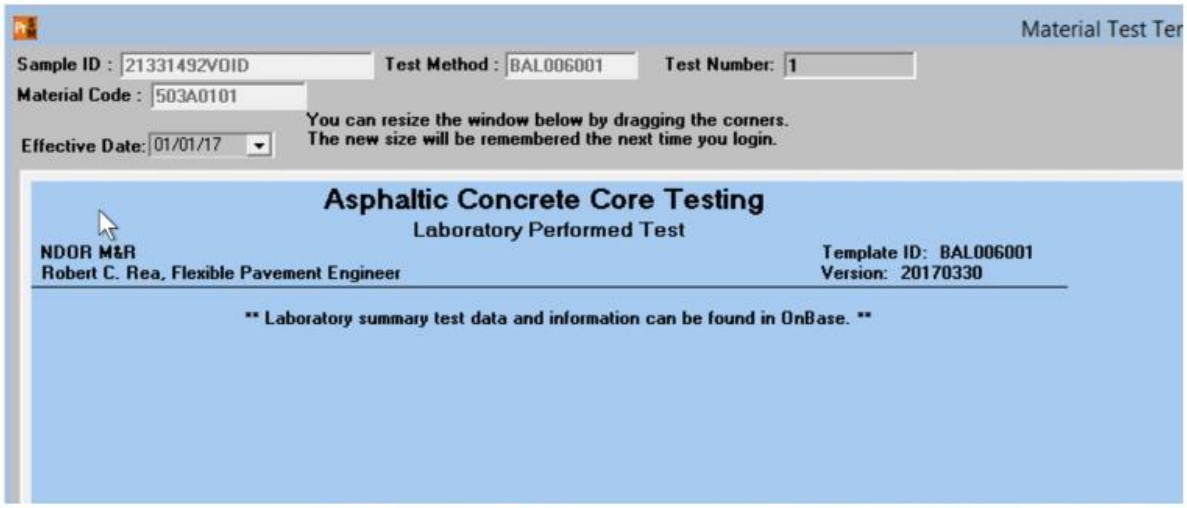

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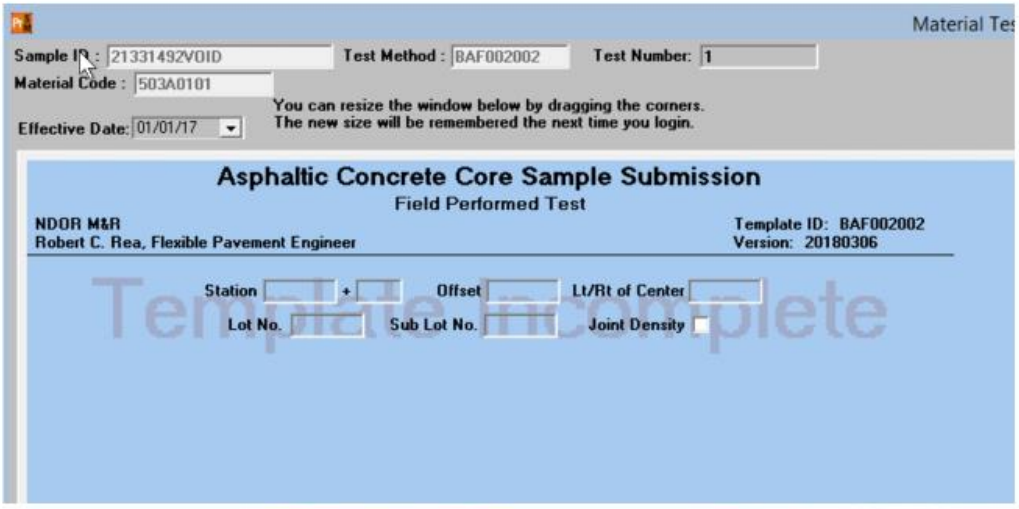

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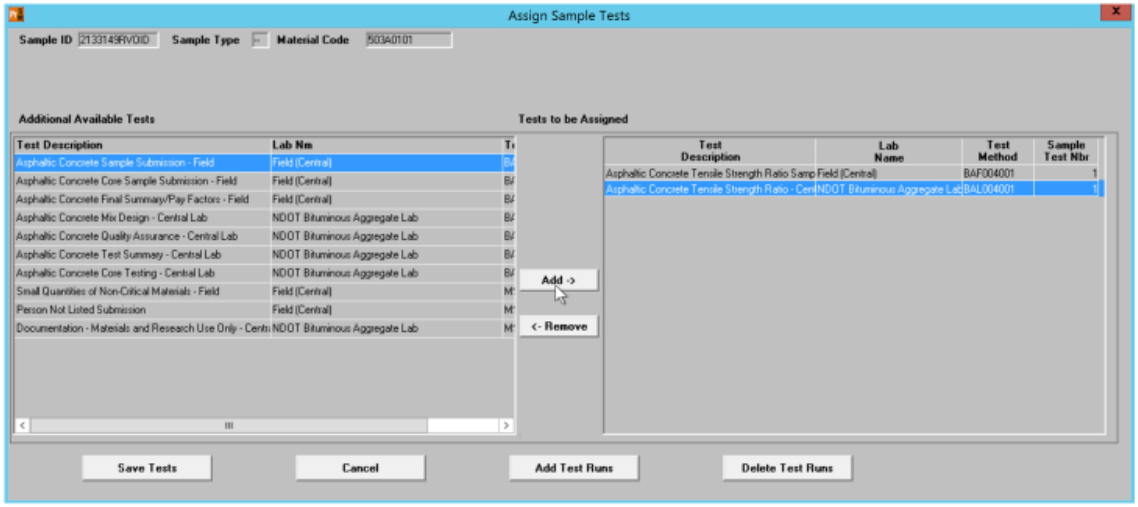

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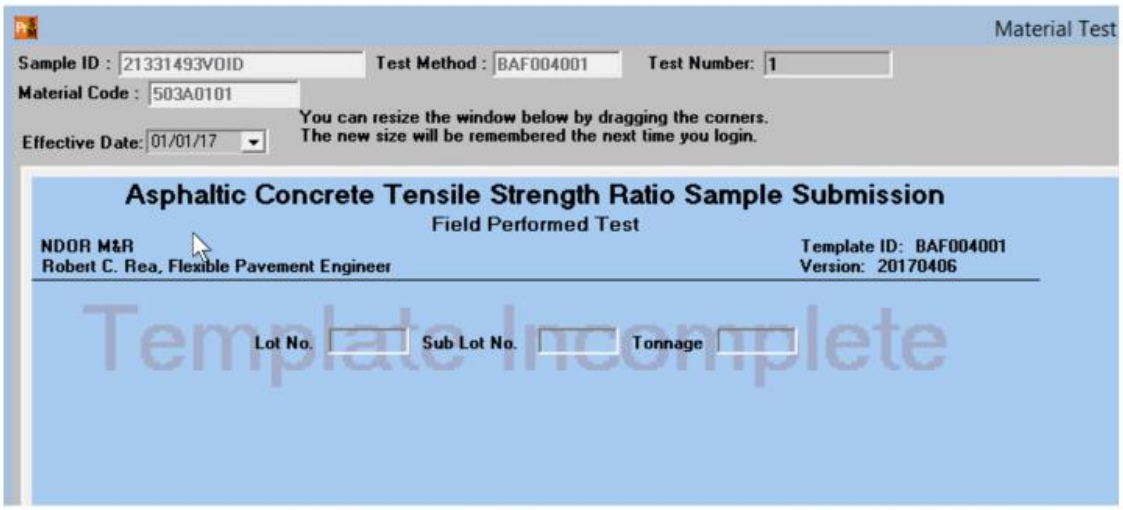

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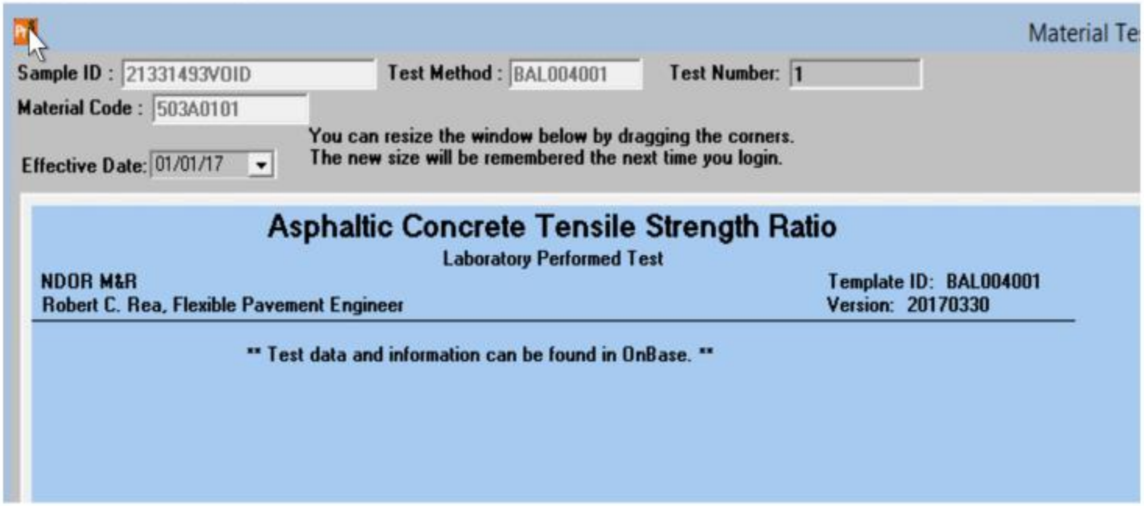


Material Te

Sample ID : 21331493VOID Test Method : BAL004001 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

Laboratory Performed Test

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

Template ID: BAL004001
Version: 20170330

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

Attachments - I

NEBRASKA DEPARTMENT OF ROADS

Asphaltic Concrete Pavement Random Sampling Schedule

Project No: STP-59-6(101) Name of Road: JCT. N-57 - JCT. N-15 Page: 1 of 1

Control No. 32126 Asphalt Weight: 32000 Asphalt Type: SPR Lot Size: 5000 Tons

Lot Number	Sublot Number	Ton to be Sampled: Lot	Ton to be Sampled: PJT	Distance from Edge (8 ft)	Distance from Edge (12 ft)	Distance from Edge (14 ft)	Distance from Edge (0 ft)	Distance to Core	FAA / CAA Cold Feed	Recuts: Distance to Core	Field Density	Joint Density*	TSR
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		
3	1	358	10358	6	9	9	0	-91	X	71	X		
3	2	1696	11696	4	3	3	0	-70		92		IN	
3	3	2727	12727	7	4	6	0	-36		53			
3	4	3934	13934	4	8	12	0	44		-40			
3	5	4195	14195	0	7	0	0	20		-33			
4	1	326	15326	0	12	1	0	-74	X	-6	X		
4	2	1963	16963	3	1	8	0	-41		51			
4	3	2757	17757	6	4	4	0	54		68			
4	4	3411	18411	8	6	1	0	65		13			
4	5	4779	19779	6	8	13	0	85		-94		IN	
5	1	371	20371	3	8	7	0	6		49			
5	2	1446	21446	7	2	8	0	-18		-64		IN	
5	3	2855	22855	1	7	8	0	-39		95			
5	4	3168	23168	2	5	14	0	25		-16			
5	5	4294	24294	3	5	11	0	-27	X	1	X		

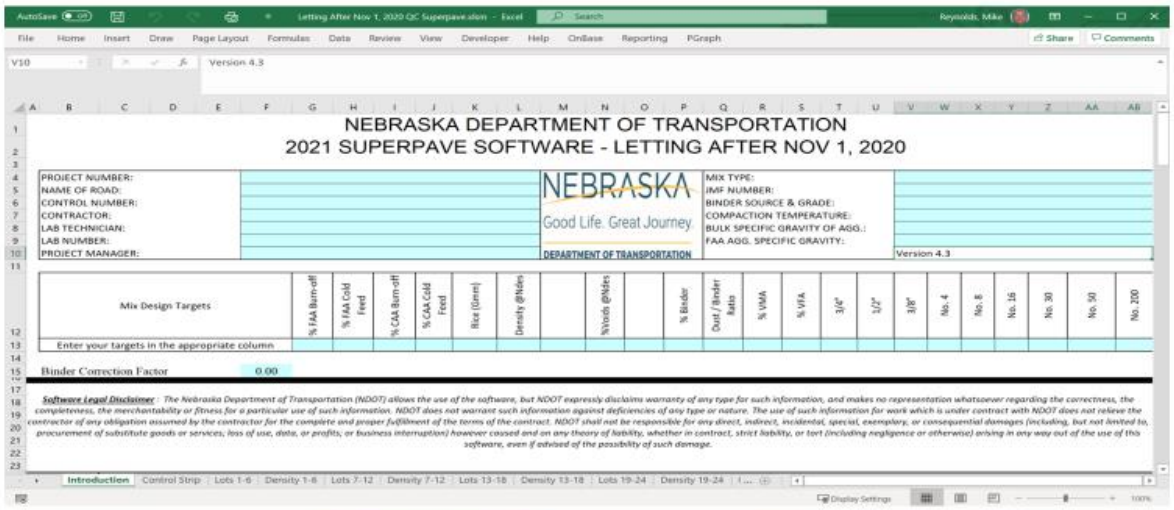
Lot Number	Sublot Number	Ton to be Sampled: Lot	Ton to be Sampled: PJT	Distance from Edge (8 ft)	Distance from Edge (12 ft)	Distance from Edge (14 ft)	Distance from Edge (0 ft)	Distance to Core	FAA / CAA Cold Feed	Recuts: Distance to Core	Field Density	Joint Density*	TSR
11	1	335	50335	8	1	11	0	-62	X	98	X		
11	2	1501	52801	0	1	14	0	-77		77		OUT	
11	3	2848	52848	2	1	7	0	-40		43			
11	4	3715	53715	0	12	4	0	76		-87			
11	5	4194	54194	4	2	12	0	-8		65			
12	1	349	55349	6	3	1	0	69		4		IN	
12	2	1862	56862	0	6	5	0	81	X	5	X		
12	3	2681	57681	3	10	7	0	-6		17			
12	4	3855	58855	2	10	13	0	36		5			
12	5	4174	59174	7	12	13	0	96		74			
13	1	881	60881	7	7	8	0	59		-4			
13	2	1206	61206	3	1	7	0	11		-47			
13	3	2585	62585	8	12	9	0	-10	X	45	X		
13	4	3319	63319	3	10	2	0	20		-31			
13	5	4690	64690	0	11	2	0	-25		-59		OUT	
14	1	293	65293	0	3	10	0	-47		-93			
14	2	1158	66158	8	7	2	0	30		8			
14	3	2970	67970	2	9	8	0	-54		2			
14	4	3320	68320	3	4	10	0	-93	X	-17	X	IN	
14	5	4598	69598	5	2	7	0	47		-74			
15	1	713	70713	6	0	6	0	87	X	36	X	OUT	
15	2	1713	71713	4	3	8	0	11		-92			
15	3	2115	72115	5	1	14	0	93		-22			
15	4	3390	73390	4	1	11	0	-69		5			
15	5	4760	74760	1	11	6	0	11		-32			

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 Lot	PJT	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	
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:

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DEPARTMENT OF TRANSPORTATION

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

Version 4.3

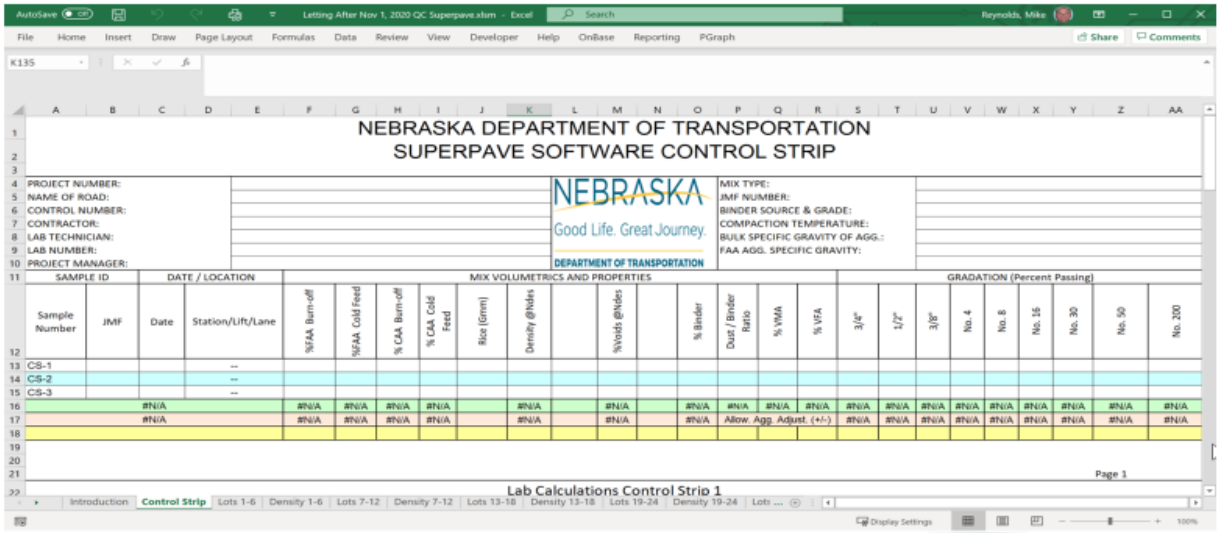
Mix Design Targets	% FAA Burn-off	% FAA Cold Feed	% CAA Burn-off	% CAA Cold Feed	Rice (Gmm)	Density @Ndes		%Voids @Nds		% Binder	Dust / Binder Ratio	% VMA	% VFA	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 200
Enter your targets in the appropriate column																						

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.*

Introduction | Control Strip | Lots 1-6 | Density 1-6 | Lots 7-12 | Density 7-12 | Lots 13-18 | Density 13-18 | Lots 19-24 | Density 19-24

Attachments - J



NEBRASKA DEPARTMENT OF TRANSPORTATION
SUPERPAVE SOFTWARE CONTROL STRIP

PROJECT NUMBER:		MIX TYPE:	
NAME OF ROAD:		JMF NUMBER:	
CONTROL NUMBER:		BINDER SOURCE & GRADE:	
CONTRACTOR:		COMPACTION TEMPERATURE:	
LAB TECHNICIAN:		BULK SPECIFIC GRAVITY OF AGG.:	
LAB NUMBER:		FAA AGG. SPECIFIC GRAVITY:	
PROJECT MANAGER:			

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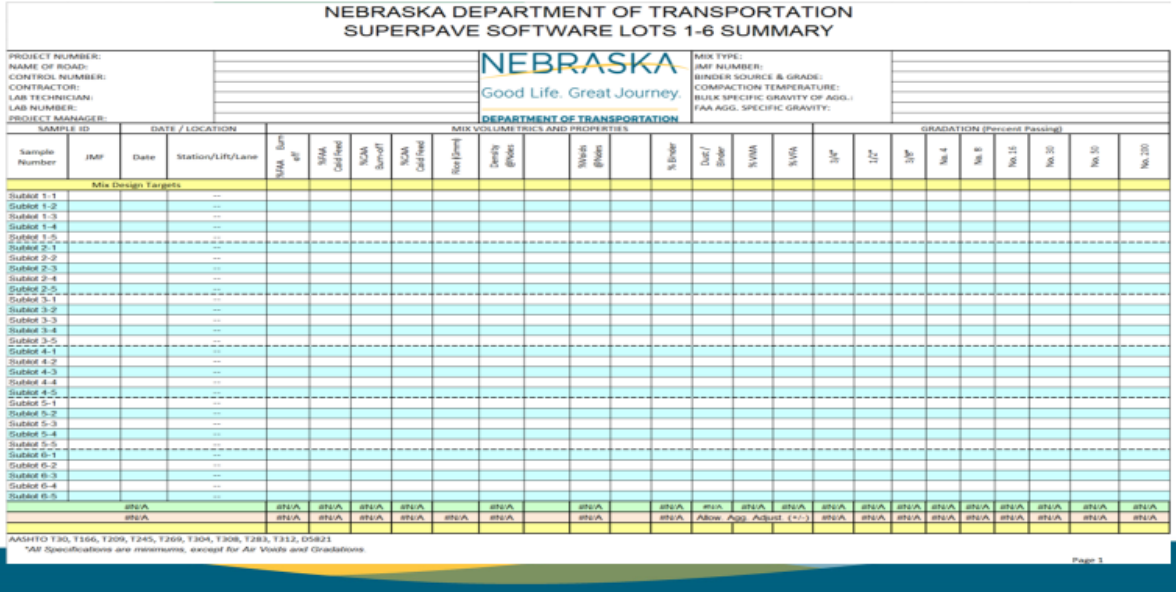
SAMPLE ID		DATE / LOCATION		MIX VOLUMETRICS AND PROPERTIES													GRADATION (Percent Passing)								
Sample Number	JMF	Date	Station/Lift/Lane	%FAA Burn-off	%FAA Cold Feed	% CAA Burn-off	% CAA Cold Feed	Rice (Gmm)	Density @Ndes		%Voids @Ndes		% Binder	Dust / Binder Ratio	% VMA	% VFA	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	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	Allow. Agg. Adjust. (+/-)			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

Page 1

Lab Calculations Control Strip 1

Introduction | Control Strip | Lots 1-6 | Density 1-6 | Lots 7-12 | Density 7-12 | Lots 13-18 | Density 13-18 | Lots 19-24 | Density 19-24 | Lots ...

Attachments - J



NEBRASKA DEPARTMENT OF TRANSPORTATION
SUPERPAVE SOFTWARE LOTS 1-6 SUMMARY

PROJECT NUMBER:		MIX TYPE:	
NAME OF ROAD:		JMF NUMBER:	
CONTROL NUMBER:		BINDER SOURCE & GRADE:	
CONTRACTOR:		COMPACTION TEMPERATURE:	
LAB TECHNICIAN:		BULK SPECIFIC GRAVITY OF AGG.:	
LAB NUMBER:		FAA AGG. SPECIFIC GRAVITY:	
PROJECT MANAGER:			

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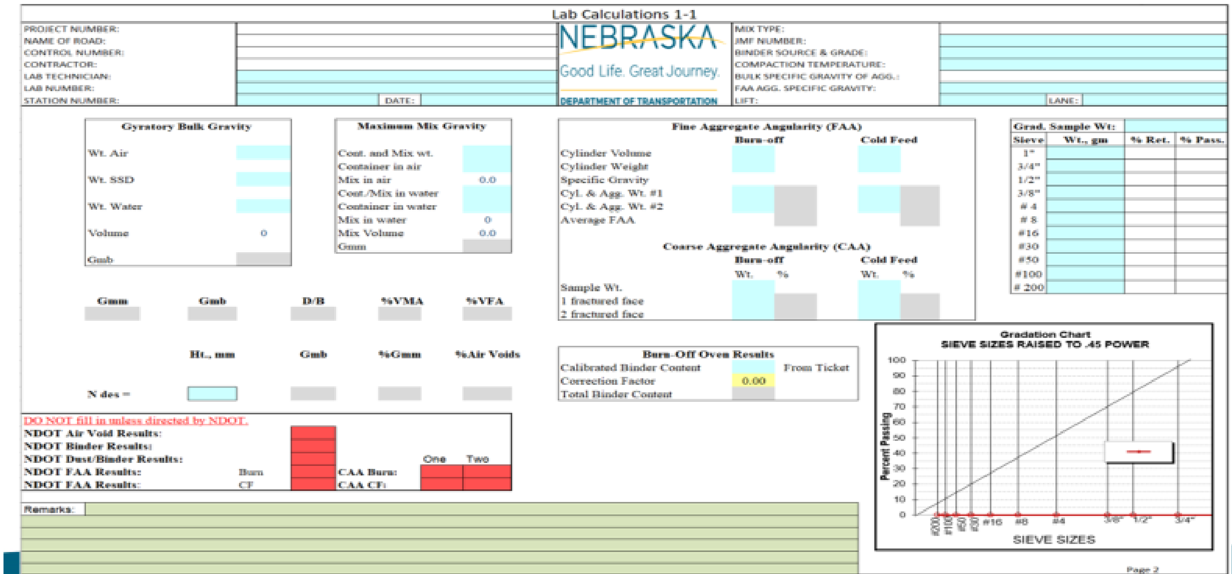
SAMPLE ID		DATE / LOCATION		MIX VOLUMETRICS AND PROPERTIES													GRADATION (Percent Passing)								
Sample Number	JMF	Date	Station/Lift/Lane	%FAA Burn-off	%FAA Cold Feed	%CAA Burn-off	%CAA Cold Feed	Rice (Gmm)	Density @Ndes		%Voids @Ndes		% Binder	Dust / Binder	% VMA	% VFA	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 200
Mix Design Targets																									
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	Allow. Agg. Adjust. (+/-)			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

AASHTO T30, T166, T209, T245, T269, T304, T308, T283, T312, D5821
*All Specifications are minimums, except for Air Voids and Gradations.

Page 1

Attachments - J


Lab Calculations 1-1

PROJECT NUMBER:
NAME OF ROAD:
CONTROL NUMBER:
CONTRACTOR:
LAB TECHNICIAN:
LAB NUMBER:
STATION NUMBER: DATE:

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

Gyratory Bulk Gravity
Wt. Air
Wt. SSD
Wt. Water
Volume 0
Gmb

Maximum Mix Gravity
Cont. and Mix wt.
Container in air
Mix in air 0.0
Cont./Mix in water
Container in water
Mix in water 0
Mix Volume 0.0
Gmm

Fine Aggregate Angularity (FAA)
Burn-off / Cold Feed
Cylinder Volume
Cylinder Weight
Specific Gravity
Cyl. & Agg. Wt. #1
Cyl. & Agg. Wt. #2
Average FAA

Coarse Aggregate Angularity (CAA)
Burn-off / Cold Feed
Wt. % / Wt. %
Sample Wt.
1 fractured face
2 fractured face

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 0.00
Total Binder Content

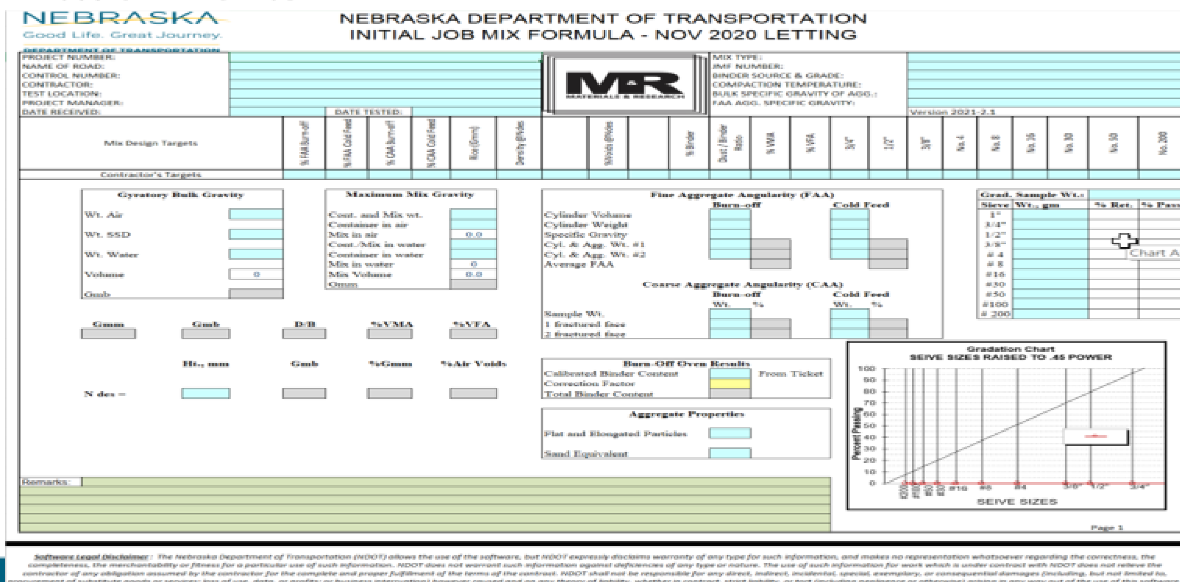
DO NOT fill in unless directed by NDOT.
NDOT Air Void Results:
NDOT Binder Results:
NDOT Dust/Binder Results: One Two
NDOT FAA Results: Burn CAA Burn:
NDOT FAA Results: CF CAA CF:

Remarks:

Gradation Chart
SIEVE SIZES RAISED TO .45 POWER
Percent Passing
SIEVE SIZES

Page 2

Attachments - K


NEBRASKA
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DEPARTMENT OF TRANSPORTATION

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

PROJECT NUMBER:
NAME OF ROAD:
CONTROL NUMBER:
CONTRACTOR:
TEST LOCATION:
PROJECT MANAGER:
DATE RECEIVED: DATE TESTED:

M&R MATERIALS & RESEARCH

MIX TYPE:
JMF NUMBER:
BINDER SOURCE & GRADE:
COMPACTION TEMPERATURE:
BULK SPECIFIC GRAVITY OF AGG.:
FAA AGG. SPECIFIC GRAVITY:
Version 2021-2.1

Mix Design Targets | % FAA Burn-off | % FAA Cold Feed | % CAA Burn-off | % CAA Cold Feed | Rice (Gmm) | Density @Ndes | %Voids @Ndes | % Binder | Dust / Binder Ratio | % VMA | % VFA | 3/4" | 1/2" | 3/8" | No. 4 | No. 8 | No. 16 | No. 30 | No. 50 | No. 200
Contractor's Targets

Gyratory Bulk Gravity
Wt. Air
Wt. SSD
Wt. Water
Volume 0
Gmb

Maximum Mix Gravity
Cont. and Mix wt.
Container in air
Mix in air 0.0
Cont./Mix in water
Container in water
Mix in water 0
Mix Volume 0.0
Gmm

Fine Aggregate Angularity (FAA)
Burn-off / Cold Feed
Cylinder Volume
Cylinder Weight
Specific Gravity
Cyl. & Agg. Wt. #1
Cyl. & Agg. Wt. #2
Average FAA

Coarse Aggregate Angularity (CAA)
Burn-off / Cold Feed
Wt. % / Wt. %
Sample Wt.
1 fractured face
2 fractured face

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

Remarks:

Gradation Chart
SEIVE SIZES RAISED TO .45 POWER
Percent Passing
SEIVE SIZES

Page 1

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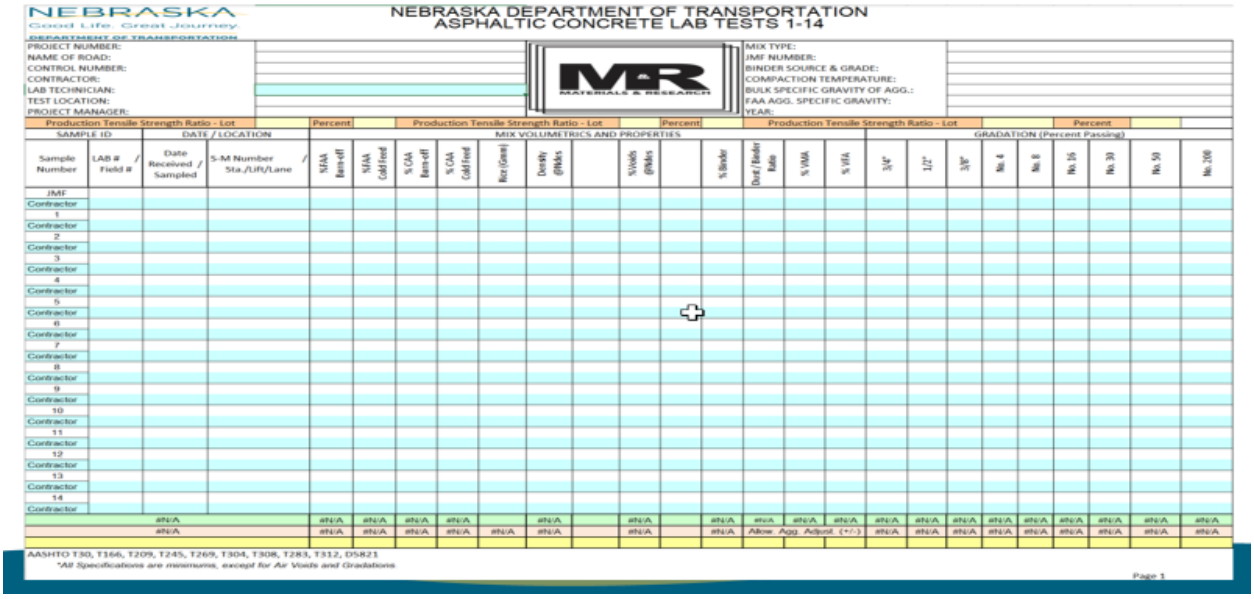
Attachments - K



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NEBRASKA DEPARTMENT OF TRANSPORTATION
ASPHALTIC CONCRETE LAB TESTS 1-14

MATERIALS & RESEARCH

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:

Production Tensile Strength Ratio - Lot | Percent | Production Tensile Strength Ratio - Lot | Percent | Production Tensile Strength Ratio - Lot | Percent

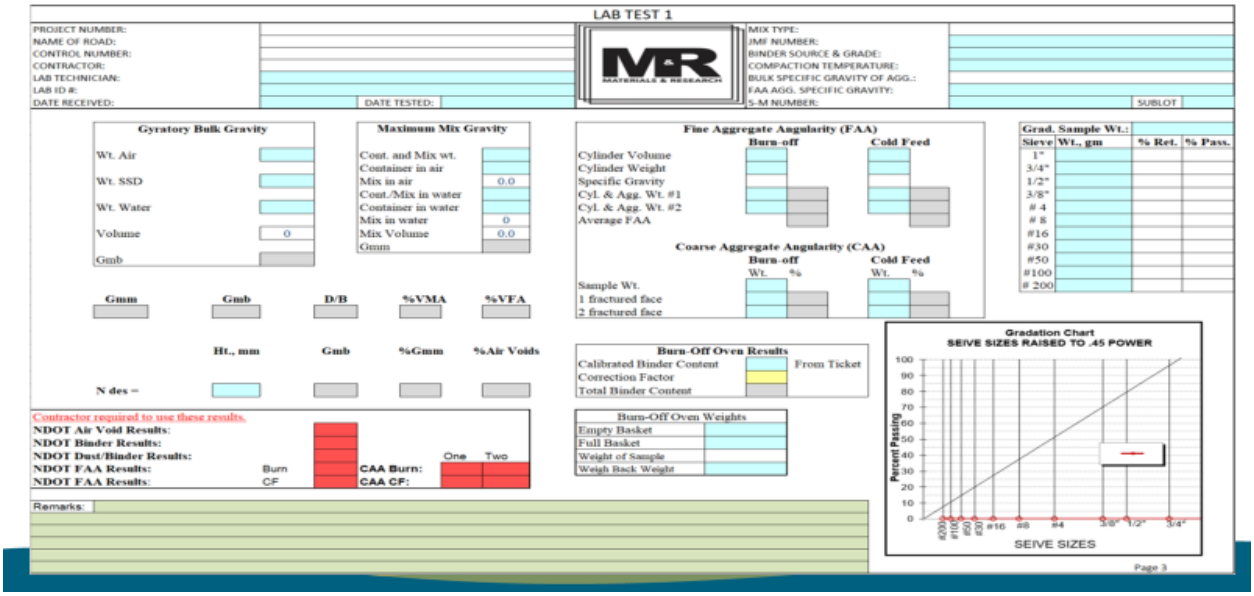
SAMPLE ID | DATE / LOCATION | MIX VOLUMETRICS AND PROPERTIES | GRADATION (Percent Passing)

Sample Number	LAB # / Field #	Date Received / Sampled	S-M Number / Sta./Lift/Lane	%FAA Burn-off	%FAA Cold Feed	% CAA Burn-off	% CAA Cold Feed	Rice (Gmm)	Density @Ndes		%Voids @Ndes		% Binder	Dust / Binder Ratio	% VMA	% VFA	3/4"	1/2"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 200
JMF																									
Contractor 1																									
Contractor 2																									
Contractor 3																									
Contractor 4																									
Contractor 5																									
Contractor 6																									
Contractor 7																									
Contractor 8																									
Contractor 9																									
Contractor 10																									
Contractor 11																									
Contractor 12																									
Contractor 13																									
Contractor 14																									
	#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	Allow. Agg. Adjust. (+/-)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

AASHTO T30, T166, T209, T245, T269, T304, T308, T283, T312, D5821
"All Specifications are minimums, except for Air Voids and Gradations.

Page 1

Attachments - K



LAB TEST 1

MATERIALS & RESEARCH

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

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

Gyratory Bulk Gravity

Wt. Air	
Wt. SSD	
Wt. Water	
Volume	0
Gmb	

Maximum Mix Gravity

Cont. and Mix wt.	
Container in air	
Mix in air	0.0
Cont./Mix in water	
Container in water	
Mix in water	0
Mix Volume	0.0
Gmm	

Fine Aggregate Angularity (FAA)

	Burn-off	Cold Feed
Cylinder Volume		
Cylinder Weight		
Specific Gravity		
Cyl. & Agg. Wt. #1		
Cyl. & Agg. Wt. #2		
Average FAA		

Coarse Aggregate Angularity (CAA)

	Burn-off Wt.	Burn-off %	Cold Feed Wt.	Cold Feed %
Sample Wt.				
1 fractured face				
2 fractured face				

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		

Contractor required to use these results.

				One	Two
NDOT Air Void Results:					
NDOT Binder Results:					
NDOT Dust/Binder Results:					
NDOT FAA Results:	Burn		CAA Burn:		
NDOT FAA Results:	CF		CAA CF:		

Burn-Off Oven Weights

Empty Basket	
Full Basket	
Weight of Sample	
Weigh Back Weight	

Remarks:

Gradation Chart
SEIVE SIZES RAISED TO .45 POWER

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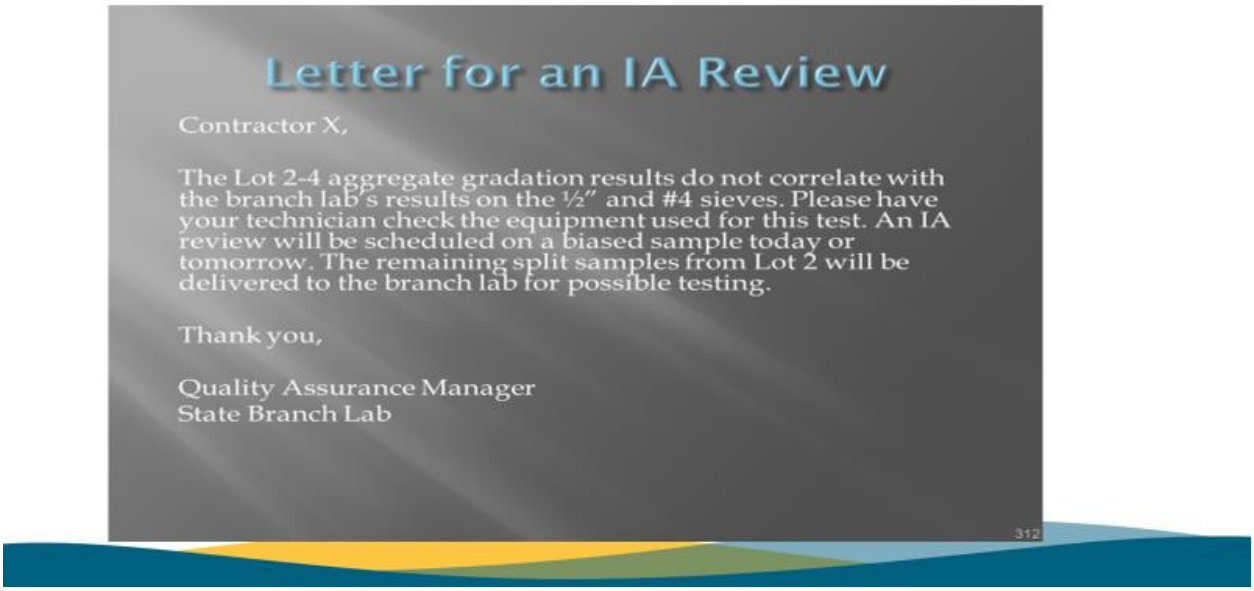
Attachments - L



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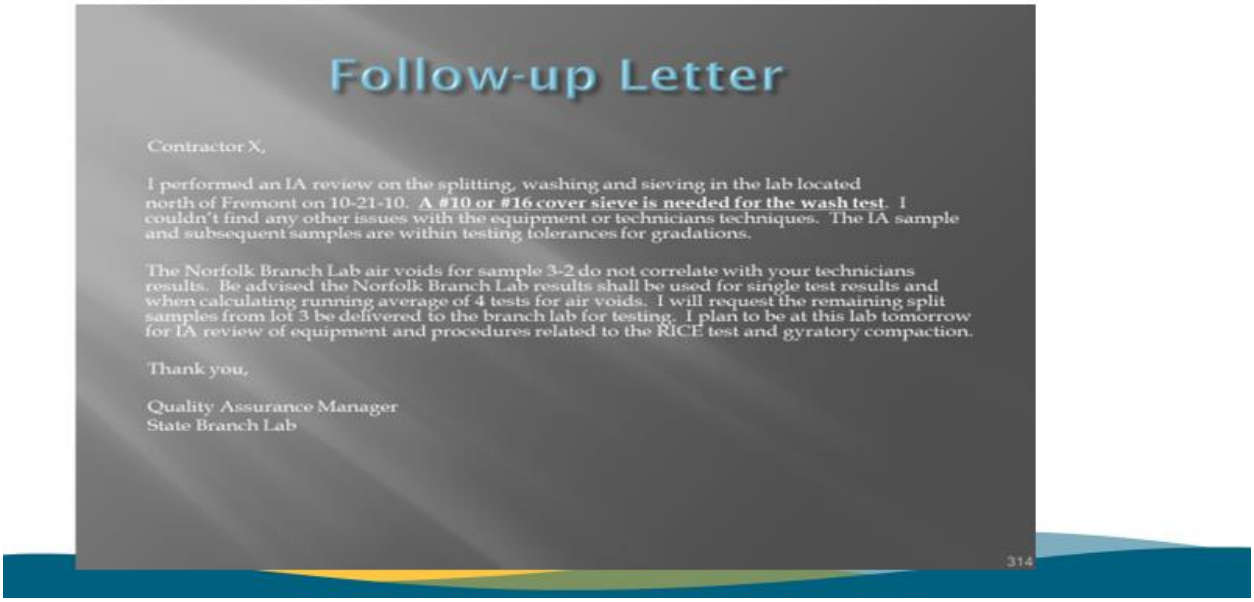

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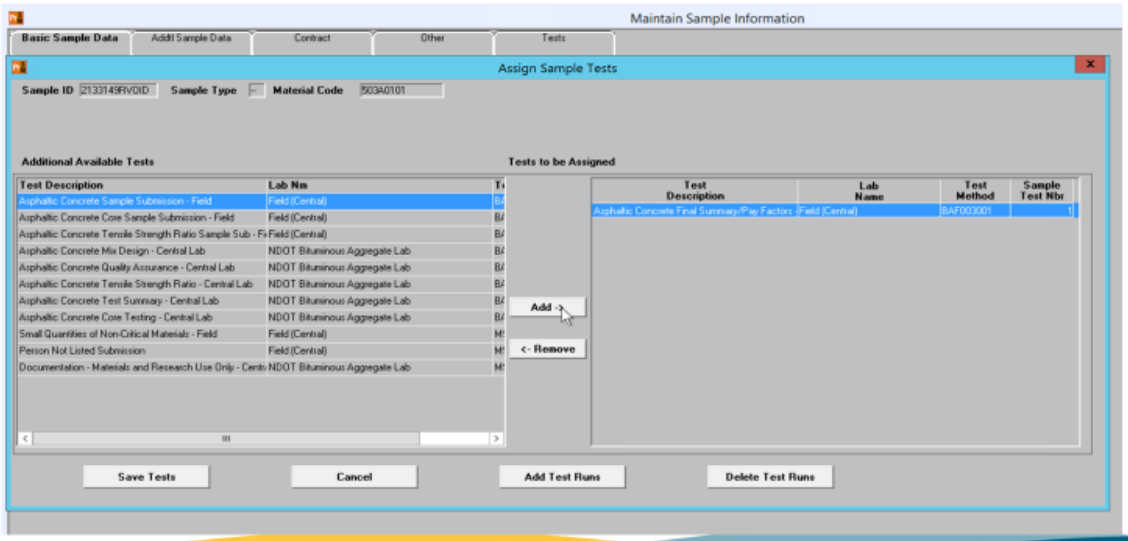

Attachments - N