Daily Paving Worksheets

QC/QA ASPHALT PAVING

1.31.2019

This guide was created as a tool for anyone working with materials test results from an asphalt paving project. Most forms shown are included in the "Daily Paving" Excel workbook. The forms represent the typical paperwork a QA lab tester will be responsible for each day.

The Excel workbook is available from the local District Materials Coordinator. It is periodically updated/corrections made. Always verify you have the current version.

Daily Paving Worksheets *by order in handout*

SFN 61067	Field Lab Equipment Checklist
SFN 9987	Pit Sample Worksheet Gradation, Wash Test, Lightweight Pieces, Fractured Faces
SFN 50289	Maximum Density Worksheet Bulk Specific Gravity of gyratory plugs, RICE and Air Voids
SFN 18674	Asphalt Content & Virgin Aggregate Determination (may be referred to as "Uniformity" Daily random sample log of asphalt and aggregate
SFN 517101	Uncompacted Void Content of Fine Aggregate Fine Aggregate Angularity or FAA
SFN 51729	Uncompacted Void Content of Fine Aggregate Cylinder Calibration
SFN 51730	Sand Equivalent of Fine Aggregate
SFN 51700	Flat or Elongated Particles in Coarse Aggregate
SFN 10071	Compaction Control Form to record and calculate random numbers and density cores
SFN 519132	Density Pay Factor Form to average density cores/determine pay factor
SFN 50290	QC – QA Test Summary Summary of daily asphalt and aggregate tests
SFN 9988	Mix Bitumen Cut-Off Report
SFN 18852	Daily Report – Hot Bituminous Pavement –Quality Control Combines aggregate gradations, asphalt content, density and waste
SFN 16767	Inspector's Diary
SFN 10072	Aggregate Quality Tests Summary Summary of all aggregate tests on a project
SFN 5650	PG Sample Information
SFN 10084	Emulsion/Cutback Sample Information

FIELD LAB EQUIPMENT CHECKLIST

North Dakota Department of Transportation, Materials and Research

SFN 61067 (5-2016)

Project Number	PCN	Date	Inspected by
		09/13/2017	

Type of Lab ☐ Aggregate ☒ Bituminous

Equipment Type	Serial/ID Number	Calibration Date	Approved
5/8" Sieve	11136881/11726	2/22/2017	☒
1/2" Sieve	11136882/11700	2/22/2017	☒
3/8" Sieve	11136883/11701	2/22/2017	☒
#4 Sieve	11136884/11716	2/22/2017	☒
#8 Sieve	11730	2/22/2017	☒
#16 Sieve	11722	2/22/2017	☒
#30 Sieve	11721	2/22/2017	☒
#50 Sieve	11720	2/22/2017	☒
#100 Sieve	11719	2/22/2017	☒
#200 Sieve	12454678/17064	2/22/2017	☒
Mary Ann Sifter	CSI-03	4/24/2017	☒
#200 Wash Sieve	1277006	2/22/2017	☒
FAA Shell & Apparatus	12643	2/22/2017	☒
Black Thermometer	12642	2/22/2017	☒
White Thermometer	14923	2/22/2017	☒
White Thermometer	19727	2/22/2017	☒
White Thermometer	19725	2/22/2017	☒
Orbital Shaker	264392-176	2/22/2017	☒
Scale	120204004/14948	2/22/2017	☒
Calipers	14970	2/22/2017	☒
			☐
			☐
			☐

Remarks

QA Lab

FIELD LAB EQUIPMENT CHECKLIST

North Dakota Department of Transportation, Materials and Research

SFN 61067 (5-2016)

Project Number	PCN	Date	Inspected by
		09/13/2017	

Type of Lab ☐ Aggregate ☒ Bituminous

Equipment Type	Serial/ID Number	Calibration Date	Approved
3/4" Sieve	BS12H121853	2/22/2017	☒
5/8" Sieve	00272947	2/22/2017	☒
1/2" Sieve	02127005	2/22/2017	☒
3/8" Sieve	3/8	2/22/2017	☒
#4 Sieve	1186932	2/22/2017	☒
#8 Sieve	8	2/22/2017	☒
#16 Sieve	HH79055	2/22/2017	☒
#30 Sieve	HH79605	2/22/2017	☒
#50 Sieve	HH78387	2/22/2017	☒
#100 Sieve	HH78144	2/22/2017	☒
#200 Sieve	11216563	2/22/2017	☒
Scale	6502489	2/22/2017	☒
Scale	14721152	2/22/2017	☒
Pine Gyro	5559	4/10/2017	☒
Oscillating Table	152065	2/22/2017	☒
Wash Sieve	155019464	2/22/2017	☒
			☐
			☐
			☐
			☐
			☐
			☐
			☐

Remarks

QC Lab

PIT SAMPLE WORKSHEET

North Dakota Department of Transportation, Materials & Research

SFN 9987 (Rev. 08-2015)

Target range correct- Do you know where to find that information?

Laboratory No.	Field
Field Sample No.	1-1
Pit Location	NW1/4 15-159-100
Owner	Smith
Project	NH-1-234(567)000
County	Dakota
Material	Superpave
Specification	430
Date Received	6/21/2016
Date Sampled	6/21/2016
Sampled From	Belt
Submitted By	ABC Engineering

(mm)	Ret.	Wt. Ret. Non-Cum.	Wt. Ret. Cum.	% Ret.	% Pass	ND Spec.	Target Range Min.	Target Range Max
100	4"							
90	3-1/2"							
75	3"							
63	2-1/2"							
50	2"							
37.5	1-1/2"							
25.0	1"							
19.0	3/4"							
16.0	5/8"	0.0	0.0	0.0	100	100	100	100
12.5	1/2"	0.0	0.0	0.0	100	70-100	94	100
9.5	3/8"	292.6	292.6	6.7	93			
4.75	No. 4	1044.1	1336.7	30.8	69	40-70	61	73
Minus No. 4		3007.3						
Wt. Check		4344.0						
Original Wt.		4337.9						

WEIGHT CHECK

Wt. Check = 0.14%

(.30% IS THE MAX ALLOWED)

AASHTO T-27 Tested By:

FRACTURED FACES

FF=Percentage of particles with fractured faces

WF = Weight of fractured particles: 236.4

WQ = Weight of questionable fractured particles: 15.1

WA = Weight of total sample: 264.8

FF = (WF + WQ/2)/WA X 100

FF = **92.1%**

ND Specification = 85

Tested By:

is sieve overloaded?

(mm)	Ret.	Wt. Ret. Non-Cum.	Wt. Ret. Cum.	% Ret.	% Pass	% Pass Tot. Smpl	ND Spec.	Target Range Min.	Target Range Max
2.36	No. 8	242.4	242.4	28.8	71.2	49			
2.00	No. 10	0.0	242.4	28.8	71.2				
1.18	No. 16	154.7	397.1	47.1	52.9	37			
600µm	No. 30	137.2	534.3	63.4	36.6	25	15-35	17	27
425µm	No. 40	0.0	534.3	63.4	36.6				
300µm	No. 50	123.9	658.2	78.1	21.9	15			
150µm	No. 100	83.3	741.5	88.0	12.0	8			
75µm	No. 200	29.5	771.0	91.5	8.5	5.9	2.0-7.0	2.9	6.9
Minus No. 200 (75µm)		3.3							
Original Wt.		842.3							
Wt. After Wash		775.2							
Wash Loss		67.1							
Wt. Check		841.4							

WEIGHT CHECK

Wt. Check = 0.11%

(0.30% IS THE MAX ALLOWED)

AASHTO T-27 Tested By:

AASHTO T-11 Tested By:

correct spec?

LIGHT WEIGHT PIECES

+ No. 4 (4.75mm) Material

(A) % Retained on No. 4 Sieve	=	30.8	%
(B) % Passing No.30, Total Sample	=	25.0	%
(C) % Pass No. 4-% Pass No. 30,[100-(A+B)]=		44.2	%
(D) Total Sample A+B+C	=	100	%
(E) Weight of Lt. Wt. Pieces in + No. 4 Mtrl.	=	29.7	g
(F) Weight of + No. 4 Material	=	1336.7	g
(G) Lt. Wt. Pieces, + No. 4 Mtrl. (E/F)x100	=	2.22	%
(H) Lt. Wt. Pieces, + No. 4 Mtrl., % of Total Sample (GxA)/100			

- No. 4, + No. 30 Material

(I) Weight of Lt Wt Pieces, -No 4 +No 30 Mtrl	3.5	g
(J) Weight of - No. 4, + No. 30 Material	534.3	g
(K) Lt Wt Pieces, - No. 4,+No. 30 (I/J)x100	0.66	%
(L) Lt Wt Pieces, -No.4, + No.30 Material % of Total Sample (KxC)/100	0.29	%
	0.68	%
(M) Light Weight Pieces in Total Sample (H+L)	0.97	%

AASHTO T-113 Tested By:

*Attention Advised

Distribution:

Hope District

Project File

6/21/2016

Date

Tester Name Here

Testing Lab supervisor

Sign report

MAXIMUM DENSITY WORKSHEET

North Dakota Department of Transportation, Construction
SFN 50289 (Rev. 03-2003)

Calibrate Flasks at beginning of the project

Actual tons sample taken

Project Number	Contractor	Date	Time
NH-1-234(567)000	XYZ Construction	6/21/16	8:15

Test Number	Lot Number	Daily Tons	Total Tons
1-1	1	1025	1025

Station	Lane	Lift
100997+20	Lt.	2nd Lift

FIELD PLUGS

PLUG NO.	WEIGHT IN AIR (A)	WEIGHT IN WATER (B)	WEIGHT SAT. SURF. (C)	VOLUME C-B =D (D)	BULK SP. GR. A / D = E (E)
1A	4730.0	2776.3	4735.9	1959.6	2.414
1B	4732.3	2786.0	4735.2	1949.2	2.428	

AVERAGE BULK SP. GR. (F) **2.421**

DENSITY (F x 62.4) PCF **151.1**

MAXIMUM MIX DENSITY

FLASK NUMBER	1		2	
G. SAMPLE CONTAINER AND SOLUTION:	3839.9		3832.5	
H. CONTAINER AND SOLUTION	3241.4		3234.5	
I. SAMPLE IN SOLUTION (G - H)	598.5		598.0	
J. SAMPLE IN AIR	1003.3		1003.3	
K. VOLUME OF VOIDLESS MIX (J - I)	404.8		405.3	
L. MEAS. MAX. SPEC. GRAVITY (J / K)	2.479		2.475	**2.477**
M. MAX. THEOR. DENSITY (62.4 X L)				**154.6**
Tolerance =	0.004			

PERCENT AIR VOIDS

$$\%\ \text{AIR VOIDS} = \frac{L - F}{L} \times 100 = \frac{2.477 - 2.421}{2.477} \times 100$$

% AIR VOIDS = **2.3%**

AGGREGATE BLEND PROPORTIONS

From SFN 18674

AC CONTENT: **5.58%**

5/8 Rock	28%				Notes
CF	33%				Plant oil setting: 5.4
ASCF	19%				Add height of plug here
NF	20%				

Plant settings when sample was taken

Tester/Inspector Name Here

Inspector's Signature

This information is obtained by communication with the plant operator/control shack. QA tester observes the QC tester as they collect the data *and then the sample*

May be referred to as "Uniformity"
430.04 E.2

Based on individual lots

ASPHALT CONTENT & VIRGIN AGGREGATE DETERMINATION

North Dakota Department of Transportation, Construction
SFN 18674 (Rev. 04-2000)

DATE: **June 21, 2016**

PROJECT	CONTRACTOR	
NH-1-234(567)000	**XYZ Construction**	
SCHEDULED HOURS	TARGET AC CONTENT	TARGET VIRGIN AGGR. %
7:00 AM to 7:00 PM	**5.20**	**94.8**

Test No.	TIME: Random Number	TIME: Test Time	(1) Aggr. Tons Rdg. (Dry Tons)	(2) Salv. Bit. Tons Rdg. (Dry Tons)	% VIR. AGGR. =(1) /[(1) + (2)] (Dry Tons)	(3) BITUMEN Flow Meter Reading (Gal)	(4) Wt. Per Gal.	(5) AC TONS Tons Used = (3) x (4) / 2000	(6) AC Percent Added = (5) / (1)+(2)+(5)
1	1024.5		914		100.00%	12607	8.566	54.00	5.58%
	0.683	8:15 AM	914		100.00%	12607	8.566	54.00	
2	2244.0		1092		100.00%	15177	8.566	65.00	5.62%
	0.496	3:00 AM	2006			27784	8.566	119.00	
3									
4									

CUTOFF REPORT COMPARISON	Totalizer Cutoff	2515		100.00%	34672	8.566	148.50	5.58%
	Totals from the Cutoff Report	Mix Produced = 2639.80			Total Bitumen Used= 147.56			5.59%

AVERAGE VIRGIN AGGR. % SUM % NUMBER = 100.00%

REMARKS

Aggregate Moisture Test 1 = 3.70%
Aggregate Moisture Test 2 = 3.10%
Aggregate Moisture Test 3 =
Aggregate Moisture Test 4 =

With this example, You should take notice that the target is 5.2 and totalizer results are 5.58, they should be relativaly close. Ask questions

Tester/Inspector Name Here
INSPECTOR'S SIGNATURE

DISTRIBUTION: PROJECT RECORDS

2017

UNCOMPACTED VOID CONTENT OF FINE AGGREGATE

North Dakota Department of Transportation, Materials & Research

SFN 51701 (Rev. 03-2015)

Project	PCN
District	Engineer
Contractor	Submitted By
Date Sampled	Material
Specification 430	Size or Class
Sampled From	Field Sample Number QA-1

Pit Location

Sand	Gravel
Aggregate	Pit Owner

Sample Number	1	2	
Dry bulk specific gravity (G)	2.654	2.654	
Volume of cylinder, mL (V)	99.85	99.85	
Weight of cylinder, gram (A)	251.0	251.0	
Wt. of cylinder + aggregate, gram (B)	397.5	397.4	
Wt. of aggregate, gram (F) = B - A	146.5	146.4	Average*
Uncompacted void content $U = \frac{V - (F/G)}{V} \times 100$	44.7	44.8	45

*round and report to whole number

ND T 304, Method A Tested by _____

	Blend %	Passing #4	SpG -#4
Agg #1	28	4.3	2.651
Agg #2	30	10	2.656
Agg #3	33	19	2.655
Agg #4	9	20	2.657
Agg #5			
Agg #6			

Sieve Size	Mass, gram
No. 16 (1.18mm)	44
No. 30 (600 µm)	57
No. 50 (300 µm)	72
No. 100 (150 µm)	17
Total	190

You need to know - and add - the aggregate blend percentages to calculate the current Dry bulk Spg of the -No. 4 material.

UNCOMPACTED VOID CONTENT OF FINE AGGREGATE CYLINDER CALIBRATION

North Dakota Department of Transportation, Materials & Research

SFN 51729 (Rev. 03-2015)

Calibrate at the beginning of the project

Contractor will also need to provide their data to QA Lab

Reference AASHTO T19

Temperature

ºF		Kg/m^3
60	15.6	999.01
65	18.3	998.54
70	21.1	997.97
73.4	23.0	997.54
75	23.9	997.32
80	26.7	996.59
85	29.4	995.83

Calibration

Wt. Cylinder + grease + glass	=	264.3	g (A)
Wt. Cylinder + grease + glass + water	=	363.9	g (B)
Temp. Water	=	73.4	ºF
Wt. Water = B - A	=	99.6	g (M)
Density of Water (Reference ASTM C29 or above)	=	997.54	Kg/m^3 (D)
Volume of cylinder = $\frac{1000M}{D}$	=	99.85	mL

AASHTO T-304

Calibrated by
Tester Name Here
Date Calibrated
6/1/2016

SAND EQUIVALENT OF FINE AGGREGATE

North Dakota Department of Transportation, Materials & Research
SFN 51730 (Rev. 03-2015)

Make sure a 3oz tin is used, and lab is equipped with shaker

Project: NH-1-234(567)000	PCN: 12345
District: Hope	Engineer: ABC Engineering
Contractor: XYZ Construction	Submitted By: ABC Engineering
Date Sampled: 6/21/2016	Material: FAA 45
Specification: 430	Size or Class: Superpave
Sampled From: Belt	Field Sample Number: 1-1

Pit Location

Sand	Gravel
Aggregate: NW1/4 15-159-100	Pit Owner: Smith

Sample Number	1A	1B	
Clay Reading[1] A	5.2	5.3	
Sand Reading[1] B	3.4	3.3	Average[2]
Sand Equivalent[2] $SE = \frac{B}{A}(100)$	65.4 66	62.3 63	64 65

[1]Report to the nearest 0.1 in. If reading falls between 0.1 inch graduations, report the next higher reading.
[2]Report as a whole number. If the calculated value is not a whole number, report the next higher whole number.

AASHTO T176, Tested By: Tester/Inspector Name Here

Unique calculation - always round up

FLAT OR ELONGATED PARTICLES IN COARSE AGGREGATE

North Dakota Department of Transportation, Materials & Research
SFN 51700 (9-2017)

Project	PCN
NH-1-234(567)000	12345
District	Engineer
Contractor	Submitted By
Date Sampled	Material
Specification	Size or Class
Sample From	Field Sample Number

Pit Location

Sand	Gravel
Aggregate	Pit Owner

					(B) Original Weight (Total Sample)	5194.7	
Sieve Size		Weight Retained	Percent Retained*	Weight (~100 Particles)	Weight Flat/ Elongated	Percent Flat/ Elongated Individual Sieve	Percent Flat/ Elongated Weighted Average
mm	in.	(A) (gram)	(C) = A/B x 100	(D) (gram)	(E) (gram)	(F) = E/D x 100	(G) = A x F
37.5	1 1/2	0					
25.0	1	0					
19.0	3/4	0	0				
12.5	1/2	280.3	5.4				0
9.5	3/8	586.0	11.2	236.7	2.3	0.97	569.4
(H) = Sum of (A)		866.3				I = Sum of (G)	569.4
						Weighted Average = I/H	0.7

*If the sieve has < 10% retained, do not test it. Use the value for the next size larger or smaller that has ≤ 10% retained.
If both a larger and smaller size have ≤ 10% retained, use the average.

ND D 4791 Tested By
Tester Name Here

COMPACTION CONTROL

North Dakota Department of Transportation, Construction
SFN 10071 (7-2017)

Project Number	PCN
NH-1-234(567)000	12345

Contractor	Class Aggregate	Grade AC	Brand AC
XYZ Construction	FAA 45	PG 58-28	Flint Hills

Lot Number	Lane	Direction of Stationing (+/-)	Date Paved	Width of Road
1	Lt.	+	06/21/2016	13

Sample Number	Beg. Sta.	Random Numbers		Sample Location		(A) Wt. In Air	(B) Wt. In Water	(C) Surface Dry	(D) Vol. (C - B)	(E) Bulk S.G. (A / D)	(F) Mat Density (E x 62.4)	(G) Maximum Theoretical Density	(H) Core Density (F / G)*100	Core Height
		Length	Width	Station	Offset									
1A	1101000	0.610	0.420	1102220	5.5	923.8	533.4	925.2	391.8	2.358	147.1		94.8	2.25"
1B						871.2	502.2	872.0	369.8	2.356	147.0	155.1	94.8	2.25"
									Average	2.357	147.1		94.8	
2A	1099000	0.290	0.850	1099580	11.1	1158.9	664.3	1159.7	495.4	2.339	146.0		94.1	2"
2B						906.8	522.4	907.4	385.0	2.355	147.0	155.1	94.8	2"
									Average	2.347	146.5		94.5	
3A	1097000	0.080	0.400	1097160	5.2	969.5	558.5	970.1	411.6	2.355	147.0		94.8	1.75"
3B						1010.3	583.1	1010.9	427.8	2.362	147.4	155.1	95.0	1.75"
									Average	2.358	147.2		94.9	
4A	1095000	0.810	0.870	1096620	11.3	947.0	540.4	947.7	407.3	2.325	145.1		93.6	1.75"
4B						987.0	564.1	987.5	423.4	2.331	145.5	155.1	93.8	1.75"
									Average	2.328	145.3		93.7	

Coordinate with paving inspector for random numbers and core locations

Write down time cores were received in the lab. Dry cores and complete ASAP

Inspector's Signature	Date

DENSITY PAY FACTOR

North Dakota Department of Transportation, Construction
SFN 59132 (Rev. 06-2009)

Completed first thing every morning

DATE PAVED	LOT NUMBER	PROJECT NUMBER
June 21, 2016	1	NH-1-234(567)000

SPECIFIED DENSITY

MAXIMUM THEORETICAL DENSITY			SAMPLE	MTD	FIELD MARSHALL PLUGS	
SUBLOT NO.	BEG TONS	RANDOM NO.	TONS	TESTS	DENSITY	AIR VOIDS
1	0	0.6830	1025	154.6	151.100	2.3%
2	1500	0.4970	2246	155.5	151.300	2.7%
3	3000		4500			
4	4500		6000			
			AVG.	155.1	151.200	2.5%

CORE DENSITY (AVG. OF 2)

147.1				
146.5				
147.2				
145.3				

AVERAGE PAVEMENT DENSITY

146.5 **LBS. / CU. FT.**

AVERAGE PAVEMENT DENSITY (% MTD)

AVG. PAVEMENT DENSITY / MTD TEST AVG.	X 100 =	94.5%

TOTAL PAY FACTOR =	1.00

TARGET DENSITY (% MT

91

Make sure using the correct %

Tester/Inspector Name Here

Inspectors Signature

QC - QA TEST SUMMARY

North Dakota Department of Transportation, Construction
SFN 50290 Rev. (04-2000)

PROJECT NUMBER		LOCATION	
NH-1-234(567)000		State Line East	
CONTRACTOR		AGGR. TYPE	AC CONTENT (%)
XYZ Construction		Superpave	5.20

			CONTR	STATE	CONTR	STATE	CONTR	STATE	CONTR	STATE
TEST NUMBER			1-1		1-2		0.0		0.0	
PAVING DAY			1		1		1		1	
DATE			6/21/16		6/21/16		6/21/16		6/21/16	
GRADATION	MIN.	MAX.								
5/8 IN. SIEVE	100	100	100		100					
MOVING AVERAGE	100	100								
1/2 IN. SIEVE	94	100	100.0		100.0					
MOVING AVERAGE	95	99								
3/8 IN. SIEVE			93.0		92.0					
MOVING AVERAGE										
#4 SIEVE	61	73	69.0		65.0					
MOVING AVERAGE	62	72								
#8 SIEVE			49.0		48.0					
MOVING AVERAGE										
#16 SIEVE			37.0		36.0					
MOVING AVERAGE										
#30 SIEVE	17	27	25.0		25.0					
MOVING AVERAGE	18	26								
#50 SIEVE			15.0		14.0					
MOVING AVERAGE										
#100 SIEVE			8.0		7.0					
MOVING AVERAGE										
#200 SIEVE	2.9	6.9	5.9		5.1					
MOVING AVERAGE	3.4	6.4								
FRACTURES	85		92.1%							
% AC TOTALIZER			5.58%		5.62%					
MOVING AVERAGE										
% AC TANK STICK			5.59		5.59		5.59		5.59	
MAX. MIX GRAVITY			2.477		2.492					
MOVING AVERAGE										
FIELD PLUG SPEC. GRAVITY			2.421		2.425					
MOVING AVERAGE										
AIR VOIDS			2.3%		2.7%					
MOVING AVERAGE										
TONS REPRESENTED										
CUMULATIVE TONS										
QUALITY CONTROL ACTIONS										

MIX BITUMEN CUT-OFF REPORT

North Dakota Department of Transportation, Construction
SFN 9988 (6-2018)

Complete at the end of the day. Compare with contractors, should be within a couple thousands. If not, find out why immediately.

See Chapter 4 of Construction Records Manual for additional information on the Mix Bitumen Cut-Off Report

Cont	Project	PCN
XYZ	NH-1-234(567)000	12345

Report Number	Covering Period (Date and Time)	Type of Bitumen
1	From 6/21/2016 6:50 To 6/21/2016 1:25	PG 58-28

BITUMEN IN STORAGE (Begin this report)

Tank No.	Hot Gallons	Temp. °F	Vol. Corr. Factor	Gallons @ 60°F
1	6,943	308	0.9161	6,360.48
2	2,251	308	0.9161	2,062.14
				0.00

UNIT WEIGHT DATA @ 60°F (from Previous Day)

Average Specific Gravity: 1.0280
Lbs./Gal. 8.563 (SG X 8.33)

(Total Gals. @ 60°F 8,422.62 X 8.563 Lbs./Gal.) ÷ 2000 = 36.061 **Tons** **[A]**

ADD BITUMEN DELIVERED THIS REPORT:

Man.#	S.G.	Lbs.
129410	1.0280	50,400
129445	1.0280	50,040
129413	1.0280	61,120
129423	1.0280	61,620
129405	1.0280	66,420
129416	1.0280	51,340

Man.#	S.G.	Lbs.
129365	1.0280	52,840
129367	1.0280	52,613

Man.#	S.G.	Lbs.

Man.#	S.G.	Lbs.

(Total Bitumen Delivered = 446,393 Lbs.) ÷ 2000 = 223.20 **Tons** **[B]**

LESS BITUMEN IN STORAGE (End this Report):

Tank No.	Hot Gallons	Temp. °F	Vol. Corr. Factor	Gallons @ 60°F
1	17,903	300	0.9187	16,447.49
2	10,467	295	0.9204	9,633.83
				0.00

UNIT WEIGHT DATA @ 60°F (from Manifests)

Average Specific Gravity: 1.0280
Lbs./Gal. 8.563 (SG X 8.330)

(Total Gals. @ 60°F 26,081.32 X 8.563 Lbs./Gal.) ÷ 2000 = 111.67 **Tons** **[C]**

LESS BITUMEN USED FOR ITEMS OTHER THAN MIX:

(Gals. @ 60°F X 8.563 Lbs./Gal.) ÷ 2000 = 0 **Tons** **[D]**

TOTAL BITUMEN USED FOR ALL MIX PRODUCED THIS REPORT:

A + B - C - D = 147.59 **Tons** **[E]**

WET MIX PRODUCED THIS REPORT: **Per Haul Sheet Number:** 1

(Pay Qty. 2,618.6 **Tons [F]**)+ (Waste, Non-pay/Priv. Use 21.2 **Tons [G]**) = 2,639.80 **Tons** **[H]**

Average Percent Bitumen in Wet Mix = (E ÷ H) X 100 = 5.59 **%** **[I]**

Waste, Non-pay/Private Use Bitumen for Mix = (G X I) / 100= 1.19 **Tons** **[J]**

Estimated Net Pay Quantity Bitumen for Mix = (E - J) = 146.40 **Tons** **[K]**

Remarks
21.2 Ton was for Private Use

Put in remarks if tonnage was waste or private use. Check with road inspector at the end of the day to make sure there isn't any waste from the road

Distribution

Plant Inspector

Project Engineer

DAILY REPORT - HOT BITUMINOUS PAVEMENT - QUALITY CONTROL

North Dakota Department of Transportation, Construction
SFN 18552 (4-2017)

Verify target ranges and values

PCN				
1	2	3	4	5

Project NH-1-234(467)000	Date 06/21/2016
Contractor XYZ Construction	District
Aggregate Class Superpave	Plant Model Barber Greene
Specification 430	Bid Price (HBP) 37
Stations Paved 100080+20 to 11103+50	

Check all calculations, especially if there is a deduct. Turn in to Project Engineer at the end of the day along with all of the previous days worksheets

Daily Paperwork Page 20 of 33

A. AGGREGATE

Gradation Range Limits

Sieve Size	5/8"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200*
Target Values	100	100		67			22			4.9
Target Range	100	100		73			27			6.9
	100	94		61			17			2.9

Percent passing

Test No.	1	100	100	93	69	49	37	25	15	8	5.9
Test No.	2	100	100	92	65	48	36	25	14	7	5.1
Test No.											
Test No.											
Test No.											
Test No.											
Uniformity (U) Dev fr Target Range											

Should be completed as soon as cores have been weighed and calculated. Give a copy to the contractor

AGGREGATE PAY FACTOR = $\frac{100 - U^{**}}{100}$ A = 1.00

Distribution:
Project Engineer (original) and Contractor

* Round Percent Passing to the nearest tenth.
**Largest Uniformity Deviation

B. BITUMEN CONTENT

AC Brand and Type Flint Hills PG 58-28

Average (SFN 9988)

Target Bitumen Content 5.2	Average Bitumen Content 5.59
Deviation from Target 0.39	AVERAGE PAY FACTOR 0.920

Uniformity (SFN 18674)

Check No. 1 5.58	Check No. 2 5.62	Check No. 3	Check No. 4
Check No. 5	Check No. 6	Average 5.6	Deviation* .02

UNIFORMITY PAY FACTOR = $\frac{100 - [20\ (\text{Deviation} - 24)]}{100}$ = 1.044

BITUMEN PAY FACTOR** B = 0.920

*Largest deviation from the average Uniformity Bitumen Content
**Lowest Pay Factor (Average or Uniformity)

C. COMPACTION (SFN 59132)

Average Maximum Theoretical Density	155.1	(lbs/c.f.)
Average Pavement Density	146.5	(lbs/c.f.)
Average Pavement Density (%MTD)	94.5	%
Pay Factor C = 1.0		

D. DEDUCTION

Combined Pay Factory

	(A)		(B)		(C)		(D)
Mainline	1.00	X	0.92	X	1.00	=	0.920
Other	1.00	X	0.92			=	0.920

Deduction Factor

M =1.0 -	(D) 0.920					=	0.080
O =1.0 -	(D) 0.92					=	0.080
	Pay Tons This Day		Bid Price		Deduction Factor		Payment Adjustment
Mainline	2618.6	X	37.00	X	0.080	=	7751.06
	Pay Tons This Day		Bid Price		Deduction Factor		Payment Adjustment
Other	0	X	37.00	X	0.920	=	0.00

TOTAL PAYMENT ADJUSTMENT: $7,751.06

REMARKS:

Engineer - Inspector

CONSTRUCTION RECORDS MANUAL

Prepared for

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
Bismarck, North Dakota Website:
http://www.dot.nd.gov/

DIRECTOR
Thomas K. Sorel

CONSTRUCTION SERVICES DIVISION
Phil Murdoff, P.E.

November 2017

14. (Section 105.02). The contractor should name their superintendent.
    a. Discuss the submission of material certifications (Section 106.01) and shop drawings:
15. The project engineer provides the contractor with a list of materials that require shop drawings or certifications
    a. Railroad protective liability insurance.
    b. Procedures for requesting subcontracts.
    c. The contractor should provide a list of all subcontractors and their work description. The contractor should also provide a list of suppliers.
    d. Discuss the contractor's starting date, work schedule and starting location.
    e. Field laboratory requirements.
    f. Discuss traffic control.
16. Signing prior to the start of construction
17. Signing and sign maintenance during construction inclement weather
18. Name designated watch person and discuss submission SFN 14634 Traffic Control Watchperson
    a. Review any other applicable specs or areas of emphasis.
    b. Review plan notes and drawings.
    c. Review special provisions.
    d. Discuss haul roads and detours
19. Inspection, maintenance, repair and release procedure
20. Structure Contracts
    a. Discuss applicable specifications such as requirements for pile hammer, welder and electrode certification, surface finish, and cure.

DIARIES

Project inspectors, surveyors, and testers should fill out an inspection diary daily. The project diary should be filled out by the Project Manager who has daily contact with the project and project superintendent. Conversations and instructions received from administrative positions such as Team Leader, Assistant District Engineer, and District Engineer should be entered in the project diary by the Project Manager.

Inspector diaries should be specific to the items dealt with by each inspector. The Project Diary should be a summary of the project's pertinent facts arranged in chronological order. Anyone reading the Project Diary should be able to comprehend the project status and determine the work performed.

The diary is used to document work progress, site conditions, labor and equipment usage, and the contractor's ability (or inability) to perform his/her work. It can provide valuable information necessary to accurately reconstruct the events of the project. The diaries will become an important part of the project records if the project is subjected to audit, investigation, or litigation.

Daily diaries are key to claims avoidance and mitigating damages. Failure to record an event carries with it the implication that the event did not occur or was insignificant and threatens the credibility of the entire log.

Consider these guidelines when writing diaries:

- The Project Diary and Inspection Diaries or other reports are meant to supplement each other and do not need to contain identical information, but the Project Diary should have a summary of important items documented in the Inspection Diaries.
- Diaries and other reports are public record and may be used in case of litigation.
- Include only factual information in them.
- Minimize personal remarks about operations or personnel of the Contractor, Agency, or other organization. Such remarks may be used to demonstrate the inspector was hostile and did not behave in a manner consistent with good faith.
- All entries should be clear, neat, and most importantly, legible.
- Summarize key points of any discussion of work activities with the Contractor.
- Be specific.

Diary entries should include the following when applicable:

- Weather conditions and how weather affected the project. Identify days when crews were sent home or were unable to work due to weather or field conditions.
- Contractor's work force, equipment, and hours worked. Describe inefficient operations and poorly maintained equipment.
- Description of major construction activity. Include locations and approximate quantities. Describe any extraordinary work being performed.
- Progress of controlling item(s) of work.
- Comments on the progress of operations as compared to the Contractor's approved schedule.
- Suspensions and resumptions of contractor operations. Causes and dates should be recorded.
- Utility operations. Report on their progress, conflicts with contractor operations and any resultant delays, and quality of workmanship as it affects the project.
- Summary of significant conversations. Include orders to the contractor, especially those pertaining to work schedule, work methods, materials, or payment; directions and advice from supervisor, and discussions with FHWA representative, property owners, local officials, and utility and railroad representatives.
- Reports of meetings and conferences. Record all sources of dispute and subsequent decisions.
- Comments on construction safety hazards and corrective measures.
- Unusual or materially different physical working conditions from those expected under the contract. Record all significant information about the working conditions, progress of work, working force, equipment and materials, which would be of value should the contractor file claims for extra compensation.
- Disagreements with the Contractor over work quality or performance, including rejected work or materials and reasons.
- Delays, difficulties, accidents, utility damages, and other unusual conditions.
- Documentation of traffic control inspections including the status of signs and devices, traffic disruptions, deficiencies and corrections, etc. **This item is now required.** truck entering signs for pit?
- Days charged and days worked. If no day is being charged, the reason for lost time days or periods when no work is in progress or no work was accomplished and reasons why.
- Describe factors or conditions that may hinder the Contractor's operations and cause delays. Also, include the time of suspending or resuming work and explanations.
- Major discrepancies in the contract. Necessary changes and subsequent actions taken to correct the situation should be recorded.
- Work or materials accepted or rejected and why.

INSPECTOR'S DIARY

North Dakota Department of Transportation,Construction Services

SFN 16767 (Rev. 07-2011)

Project Number	Contractor or Sub
NH-1-234(567)000 PCN 12345	XYZ Construction

Date	Day	Inspector
6/21/2016	Thursday	

Weather: AM: Partly cloudy, light breeze, 65-75 degress PM: Partly cloudy, calm, 75-90 degress

Work in Progress:

Paving FAA 45

Communications/Instructions/Remarks:

Bin Settings: #1-Rock 37
#2-CF 16
#3-ASCF 14
#4-NF 33
Oil setting: 5.2
Moisture setting: 3.2
(Any changes to the settings should be documented with the change and time of the change)

Short shutdowns in early morning waiting for trucks. Plant shut down at 1:25 due to paver breaking down. (long plant shutdowns should be documented by times, and reason for shutdown)

Noticed the loader operator was digging into the bed of the stockpiles and told Joe (Plant Operator). Checked later and this is corrected. (Communications, improper operations and corrections must be documented)

Temps of oil in storage: 290@7:30, 290@10:15
continued on page 2

Contractor/Subcontractor Labor Force:

3 @ plant
12 truck drivers

Hours Worked: 6:50-1:25

Equipment	Hours Worked	Hours Down	Standby Hours
Barber Greene Plant	6:50 - 1:25		
927M Cat Front End Loader	6:50 - 1:25		
12 Trucks	6:50 - 1:25		
Bobcat 650 Skid-Steer	6:50 - 1:25		

(Use additional Sheets if Necessary.)

Signature (inspector)

INSPECTOR'S DIARY

North Dakota Department of Transportation,Construction Services

SFN 16767 (Rev. 07-2011)

Project Number	Contractor or Sub
NH-1-234(567)000 PCN 12345	XYZ Construction

Date	Day	Inspector
6/21/2016	Thursday	

Weather: AM: Partly cloudy, light breeze, 65-75 degress PM: Partly cloudy, calm, 75-90 degress

Work in Progress:

Paving FAA 45

Communications/Instructions/Remarks:

Temps of Mix: 286@7:05, 288@10:10

Scale Check: all within tolerance, see attached (attach all documents showing scale checks)

Tons Produced today: 2,618.6 Tons, 21.2 tons went for private use
Cut off: 5.59%
Density: 94.5%
Air Voids: 2.3%, 2.7%
QC/QA comparisons all within tolerance
Failing tests: Cut off was out of tolerance by 0.39

(First days diary should show the plant meets specifications and that it is was calibrated)

Contractor/Subcontractor Labor Force:

3 @ plant
12 truck drivers

Hours Worked: 6:50-1:25

Equipment	Hours Worked	Hours Down	Standby Hours
Barber Greene Plant	6:50 - 1:25		
927M Cat Front End Loader	6:50 - 1:25		
12 Trucks	6:50 - 1:25		
Bobcat 650 Skid-Steer	6:50 - 1:25		

(Use additional Sheets if Necessary.)

Signature (inspector)

North Dakota nd.gov Official Portal for North Dakota State Government

Construction Automated Records System

Project: SS-6-032(053)205 Main Menu

SubProject: 1 - MILL AND RECYCLE HMA

Inspection Diary View All «

Date Created: 06/16/2016
Inspection Date: 06/16/2016
Contractor: KNIFE RIVER MATERIALS
Inspector: Kyle J. Mittlieder

Weather 1 :

Time :	06:00	**Temperature :**	59
Sky Cover :	CLOUDY	**Humidity :**	100
Wind Direction :	SouthEast	**Wind Speed :**	5 - 15 mph
Precip. Forcast :		**Precip. Intensity :**	

Weather 2 :

Time :	12:00	**Temperature :**	70
Sky Cover :	CLOUDY	**Humidity :**	78
Wind Direction :	SouthEast	**Wind Speed :**	5 - 15 mph
Precip. Forcast :		**Precip. Intensity :**	

Weather 3 :

Time :	18:00	**Temperature :**	79
Sky Cover :	CLEAR/SUNNY	**Humidity :**	69
Wind Direction :	SouthEast	**Wind Speed :**	5 - 15 mph
Precip. Forcast :		**Precip. Intensity :**	

Work in Progress: Production of FAA 43 Superpave at Knife River Plant near Fordville, ND. Plant did not begin production until 9:15am due to foggy conditions on the project. Production finished for the day at 8:15pm.

Remarks: All QC tests were within the working range. QA test was with tolerance of adjacent QC test. A 3-way split with the district lab was also taken with results pending. See materials file for complete, detailed test results. Target AC = 4.70%. Actual AC = 4.70%. Average temperature of mix at the plant was 300 F. Totals for the day: Mix Produced = 4743.61 Tons with 26.04 Tons of (off the project) Road Waste for a net production of 4717.57 Tons for the project. --- Bin splits at the start of the project were as follows: 23% Fines, 26% rock, 13% Dirty Dust, 14% Washed Dust, and 24% RAP. At 1:20pm a blend change was made due to discovery of low Air Voids. The bin splits after this change were: 25% Fines, 26% Rock, 13% Dirty Dust, 15% Washed Dust, and 21% RAP.

Labor Force: 1 Plant Operator, 1 Grounds Keeper, 1 Superintendent, 2 Operators, 2 QC Personnel, and 1 Mechanic

Hours Worked: 09:00 to 20:30

Hours Worked: 09:00 to 20:30

File Comments:

New Attachments: Choose File No file chosen

Add More Files

Supplements:

Number **Text**

Equipment

Unit	Description	Hours Worked	Hours Down	Standby Hours
1 N/A	Drum Dryer Asphalt Plant	11.5		
11836	Dodge RAM 1500 work truck	11.5		
11861	Chevrolet 2500 Superintendent's truck	11.5		
26412	Ford F550 Mechanics Truck	11.5		
30007	CAT 140H Motor Grader	11.5		
35601	CAT 980K Payloader	11.5		
36437	CAT 246D Skidsteer	11.5		
D4753	CAT D6N Dozer	11.5		

Return Diary Selection Add Supplement Save

Main Menu Logout User:Kyle J. Mittlieder PCN:20684

AGGREGATE QUALITY TESTS SUMMARY

North Dakota Department of Transportation, Materials & Research
SFN 10072 (8-2017)

Fill out daily

Project Number	PCN	Aggregate Class
NH-1-234(567)000	12345	FAA45
Specification Section Number	**Title**	**LA Abrasion**
430	Superpave	
Location		**Lab Number**
State Line East — Location of project, can get off bidders proposal or plans		
Source of Aggregates		
NW1/4 15-159-100 (Smith) — Legal description of pit, not COA #, and owner		

Legend - Test Type
E - Engineer
C - Contractor
I - IA
P - Progress Record

SPECIFICATIONS	SIEVE SIZES AND PERCENTS PASSING											
	5/8"	1/2"	#4	#30	#200	FAA	SE	FF	Shale			
	100	100	73	27	6.9	45 Min	40 Min	85 Min	5.0 Max			
	100	94	61	17	2.9							

TEST DATA

DATE/TIME SAMPLED	LOCATION SAMPLED	TEST NO.	TEST TYPE	PERCENTS PASSING												REMARKS
6/21/16/8:00	Conveyor Belt	1-1	C	100	100	69	25	5.9	45	64	92	1.0				
6/2/17/11:55	Conveyor Belt	1-2	C	100	100	65	25	5.1								

Include QA and IA samples. List all pits used for materials, if there is a change in a pit, start a new summary. If any target value changes, start a new summary. Show the 5/8" sieve. Show only sieves with specifications. In remarks, put Deduct Applied if there was a deduct.

If the PI and LL are required, these should also be shown. Sieve size percentages and physical property results shall be reported to the required specification. Include all tests conducted, both passing and failing, and circle all failing percentages. Indicate under "Remarks" the action taken to correct the situation causing failing tests. As each item of the project is completed, submit the original copies of these reports to the district materials coordinator for correction and review. When the district materials coordinator is satisfied that all testes are tabulated, place form in the project records.

Submitted by Project Engineer Name	Reviewed by District Materials Coordinator Name	Date

EMULSION/CUTBACK SAMPLE INFORMATION

North Dakota Department of Transportation, Materials & Research Division
SFN 10084 (Rev. 02-2014)

Project SOIB-1-234(567)000	PCN 12345
District Williston	Engineer ABC Engineering
Contractor XYZ Construction	Submitted By ABC Engineering
Manufacturer McAsphalt Emulsions	Material Type/Grade MS1
Remarks	
Date Received	Date Tested

☐ Meets Specs ☐ Does Not Meet Specs

Lab Number	Field Sample Number	Date Sampled	Manifest Number	For Emulsion
	1	6/21/2016	369124	☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half
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				☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half
				☐ 1st Half ☐ 2nd Half

Submit copies of manifests, must be legible

Containers must be clean. Observe sampling. Always let some run out of the sampling valve before collecting the sample

Information on manifest must include project #, pcn, sample #, and date sampled

Information on sample must include project #, pcn, sample #, type of oil, contractor, manufacturer, manifest #, date samped.

AASHTO T-59 _____ AASHTO T-201_____ Tested By _____

PG SAMPLE INFORMATION

North Dakota Department of Transportation,Materials & Research Division
SFN 5650 (Rev. 02-2014)

Project SOIB-1-234(567)000	PCN 12345
District Williston	Engineer ABC Engineering
Contractor XYZ Construction	Submitted by ABC Engineering
Manufacturer Flint Hills	Date Received
Remarks	

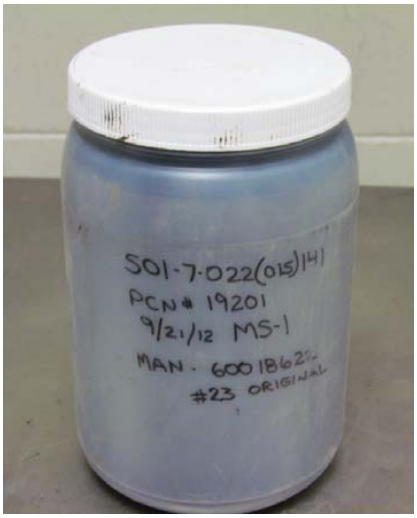
Same as emulsion samples-observe, clean, legible

Same info as emulsion on manifest and sample.
Drain out approximately one gallon before collecting the sample

Lab Number	Field Sample #	Date Sampled	Material Type/Grade	Manifest #
	1	6/21/16	PG 58-28	129445

Asphalt Sample Containers

Properly Labeled Emulsion Sample



Improperly Labeled Emulsion Sample

Improper Sample Cans for PG Asphalt

Improper Emulsion Sample Container

Unacceptable PG Asphalt Sample

Proper PG Asphalt Sample