Department of Design and Construction

Feniosky Peña-Mora
Commissioner

Mark A. Canu
Associate Commissioner
Safety & Site Support

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Division of Safety & Site Support
QA and Construction Safety Bureau

Concrete and Asphalt Generic Mix Design Approval # 2015 - 088

Date: 2/25/16

To: Larry Santana
Flushing Asphalt

From: John M. DeVito, Director
QA & Construction Safety Bureau

Date Submitted: 2/18/16

Plant: Flushing Asphalt

NYSDOT Facility Numbers: H0239

Laboratory: N/A

Mix Design Type: 6FRA Top

Generic Mix Design Serial Number: FlushingAsphalt/6FRA/Top/Generic/NYCDDC/009/16

Generic Mix Design Date: 2/11/16

Generic Mix Design Expiration Date: 2/28/18

Comments:
1) This mix design is approved only for the NYSDOT Facility Numbers listed above.
2) Approval is limited to the material sources and aggregate sizes shown on the mix design.
3) Dosage of admixtures may be adjusted by the plant within manufacturer's written guidelines, but admixtures not listed may not be added.

Reviewed & Prepared by: Christopher Vagnone, QA Inspector Christopher Vagnone

Recommended for Acceptance by: Richard Jones, PE, Deputy Director

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 6F RA TOP MIX

PLANT NAME:	FLUSHING ASPHALT	MIX DESIGN DATE:	2/11/2016
NYSDOT FACILITY #:	H0239	PREPARED BY:	LARRY SANTANA
PLANT ADDRESS:	FLUSHING	COMPANY:	FLUSHING ASPHALT
	New York, NY	PLANT QC MGR:	LARRY SANTANA

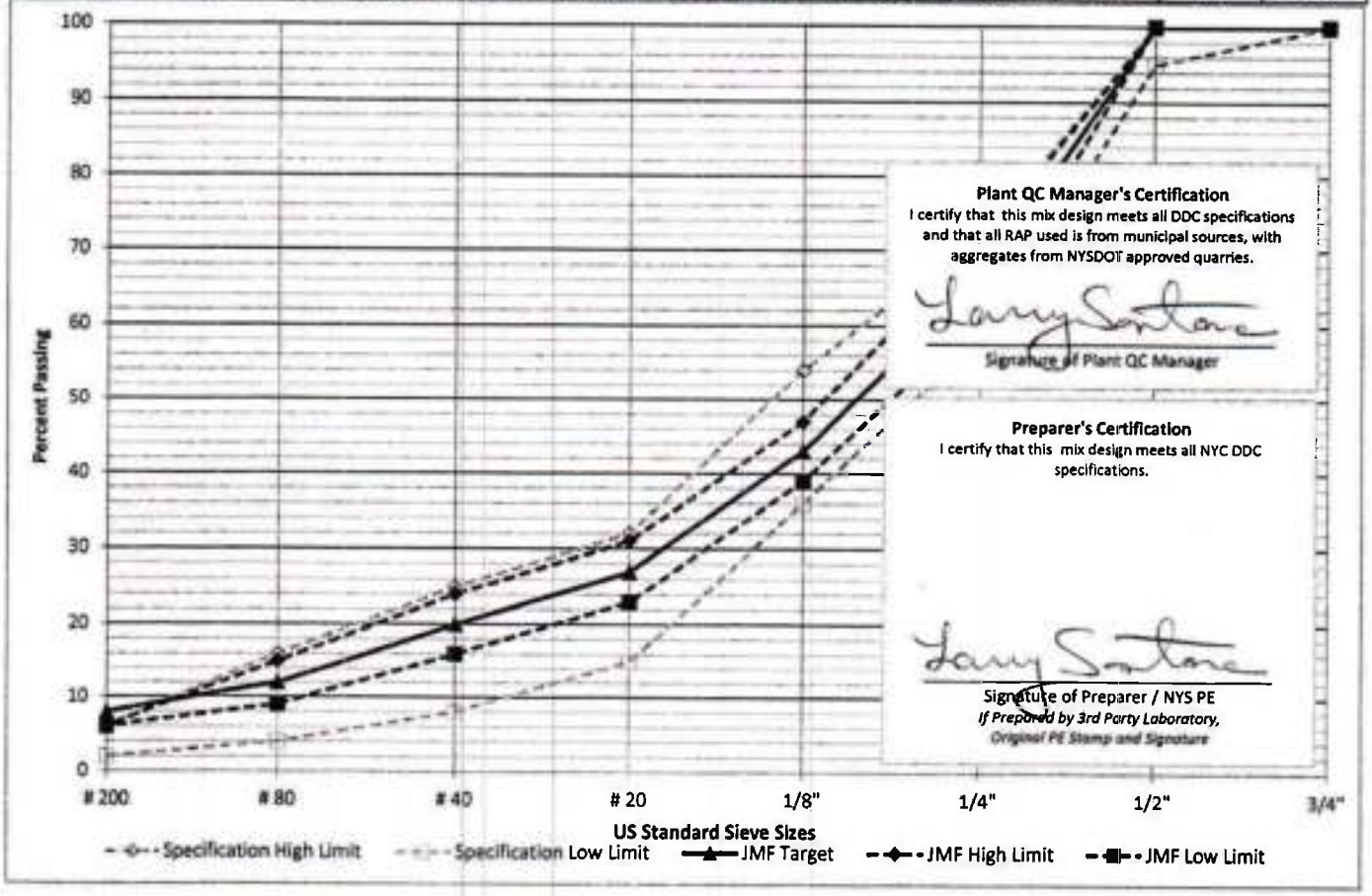
Item	Supplier / Quarry	NYSDOT Source	Friction Agg.	Agg. Blend %	Mix %	Lbs / Ton
					0.0%	0
#1 Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	28.7%	27.7%	553
#1A Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	18.0%	17.4%	347
					0.0%	0
Manufactured Sand	Tilcon, Mt Hope,NJ	8-32R	N/A	23.3%	22.5%	449
Screenings	Tilcon, Mt Hope,NJ	8-32R	N/A	0.0%	0.0%	0
RAP	Flushing Asphalt Co.	N/A	Yes	30.0%	28.9%	578
	RAP % Asphalt: 6.0%			RAP AC	1.7%	34
All RAP to be from Municipal Sources - Aggregates from State Quarries				RAP Aggregate	27.2%	544
		N/A			0.0%	0
	RAP % Asphalt:			RAP AC	0.0%	0
All RAP to be from Municipal Sources - Aggregates from State Quarries				RAP Aggregate	0.0%	0
Virgin Asphalt	Grade: PG64-22	SG (G_b):	1.034		3.6%	72
Total Asphalt Content (P_b)					5.3%	106
				100.0%	100.0%	2,000

Project No: Generic
APPROVED
NYC DDC (QACS BUREAU)
Date: 2/25/16 Reviewed By: CY
LOG NO: 2016-089

QACS APPROVAL STAMP

FlushingAsphalt/6FRA/Top/Generic/NYCDDC/009/16 Expires 2/28/2018

Sieve Size	1-1/2"	1"	3/4"	1/2"	1/4"	1/8"	# 20	# 40	# 80	# 200	P_b
Specification Limits	100-100	100-100	100-100	95-100	58-72	36-54	15-32	8-25	4-16	2-6	5-6.2
JMF Target	100	100	100	100	66	43	27	20	12	8	5.3
JMF Range	100-100	100-100	100-100	100-100	61-71	39-47	23-31	16-24	9-15	2-6	5-6



Plant QC Manager's Certification
I certify that this mix design meets all DDC specifications and that all RAP used is from municipal sources, with aggregates from NYSDOT approved quarries.

Larry Santana
Signature of Plant QC Manager

Preparer's Certification
I certify that this mix design meets all NYC DDC specifications.

Larry Santana
Signature of Preparer / NYS PE
If Prepared by 3rd Party Laboratory, Original PE Stamp and Signature

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 6F RA TOP MIX

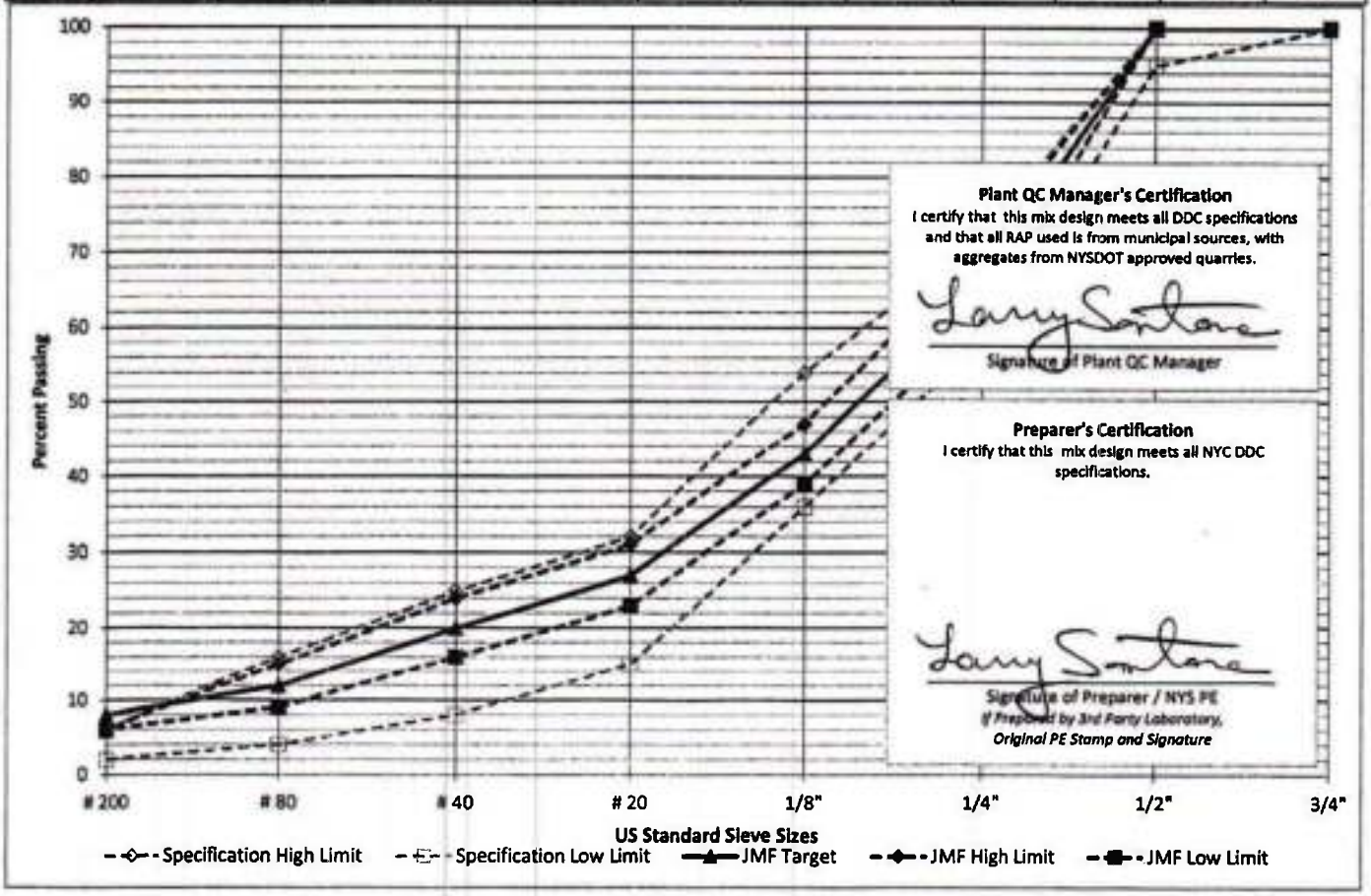
PLANT NAME:	FLUSHING ASPHALT	MIX DESIGN DATE:	2/11/2016
NYSDOT FACILITY #:	H0239	PREPARED BY:	LARRY SANTANA
PLANT ADDRESS:	FLUSHING	COMPANY:	FLUSHING ASPHALT
	New York, NY	PLANT QC MGR:	LARRY SANTANA

Item	Supplier / Quarry	NYSDOT Source	Friction Agg.	Agg. Blend %	Mix %	Lbs / Ton
					0.0%	0
#1 Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	28.7%	27.7%	553
#1A Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	18.0%	17.4%	347
					0.0%	0
Manufactured Sand	Tilcon, Mt Hope,NJ	8-32R	N/A	23.3%	22.5%	449
Screenings	Tilcon, Mt Hope,NJ	8-32R	N/A	0.0%	0.0%	0
RAP	Flushing Asphalt Co.	N/A	Yes	30.0%	28.9%	578
	RAP % Asphalt: 6.0%		RAP AC		1.7%	34
All RAP to be from Municipal Sources - Aggregates from State Quarries			RAP Aggregate		27.2%	544
		N/A			0.0%	0
	RAP % Asphalt:		RAP AC		0.0%	0
All RAP to be from Municipal Sources - Aggregates from State Quarries			RAP Aggregate		0.0%	0
Virgin Asphalt	Grade: PG64-22	SG (G_b):	1.034		3.6%	72
Total Asphalt Content (P_b)					5.3%	106
				100.0%	100.0%	2,000

DASC APPROVAL STAMP

FlushingAsphalt/6FRA/Top/Generic/NYCDDC/009/16 Expires 2/28/2018

Sieve Size	1-1/2"	1"	3/4"	1/2"	1/4"	1/8"	# 20	# 40	# 80	# 200	P_b
Specification Limits	100-100	100-100	100-100	95-100	58-72	36-54	15-32	8-25	4-16	2-6	5-6.2
JMF Target	100	100	100	100	66	43	27	20	12	8	5.3
JMF Range	100-100	100-100	100-100	100-100	61-71	39-47	23-31	16-24	9-15	2-6	5-6



Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT COMBINED GRADATION WORKSHEET - 6F RA TOP MIX

PLANT NAME:	FLUSHING ASPHALT	NYSDOT FACILITY #:	H0239	MIX DESIGN DATE:	2/11/2016

Average Bin Gradations

	Not Used		#1 Stone		#1A Stone		Not Used		Manufactured Sand		Screenings		RAP		Not Used	
Sieve	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass
1.5"		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0
1"		100.0	0.0	100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0	0.0	100.0		100.0
3/4"		100.0	0.0	100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0	0.0	100.0		100.0
1/2"		100.0	0.7	99.3	0.0	100.0		100.0	0.0	100.0	0.0	100.0	0.0	100.0		100.0
1/4"		100.0	84.8	14.5	10.9	89.1		100.0	0.0	100.0	0.1	99.9	24.8	75.2		100.0
1/8"		100.0	12.4	2.1	85.0	14.1		100.0	4.8	95.2	12.4	87.5	22.3	52.9		100.0
#20		100.0	0.0	2.1	8.0	16.1		100.0	36.5	58.7	37.9	49.6	19.1	33.8		100.0
#40		100.0	0.0	2.1	0.0	16.1		100.0	19.2	39.5	13.3	36.3	8.9	24.9		100.0
#80		100.0	0.0	2.1	0.0	16.1		100.0	20.2	19.3	14.8	21.5	10.2	14.7		100.0
#200		100.0	0.0	2.1	0.0	16.1		100.0	14.2	5.1	8.8	12.7	5.4	9.3		100.0
Pan			2.1		16.1				5.1		12.7		9.3			
Totals	0.0		100.0		100.0		0.0		100.0		100.0		100.0		0.0	

Stockpiles Sampled By:	Florin Niculescu	Date Sampled:	2/6/2016
Gradation Technician:	Florin Niculescu	Date Tested:	2/8/2016

Coarse Aggregate Specific Gravity per ASTM C127

Discard portion of sample that passes the 1/4 sieve.

Only Perform this test if aggregate is 10% or more coarse (less than 90% passing the 1/4" sieve)

	Not Used	#1 Stone	#1A Stone	Not Used	Manufactured Sand	Screenings	RAP	Not Used
% Coarse Agg.	---	85.5%	10.9%	---	0.0%	0.1%	24.8%	---
Test Required?	NO	YES	YES	NO	NO	NO	YES	NO
A) Wt. in Air		1478.4	1480.3				1023.4	
B) Wt. SSD		1483.0	1485.3				1029.6	
C) Wt. in Water		935.0	935.1				643.2	
G_{sb} [A/(B-C)]	---	2.698	2.690	---	---	---	2.649	---
G_{sa} [A/(A-C)]	---	2.721	2.715	---	---	---	2.692	---

Fine Aggregate Specific Gravity per ASTM C128

Discard portion of sample that does not pass the #4 sieve.

Only Perform this test if 10% or more passes the 1/4" Sieve.

	Not Used	#1 Stone	#1A Stone	Not Used	Manufactured Sand	Screenings	RAP	Not Used
% Fine Agg.	---	14.5%	89.1%	---	100.0%	99.9%	75.2%	---
Test Required?	NO	YES	YES	NO	YES	YES	YES	NO
A) Wt. in Air		1478.4	1480.3		497.8	496.3	1023.4	
B) Wt. Flask + Water		0.0	0.0		680.0	685.0	0.0	
C) Wt. Flask + Water + Sample		935.0	935.1		992.8	997.0	643.2	
S) Wt. SSD		1483.0	1485.3		500.1	500.0	1029.6	
G_{sb} [A/(B+S-C)]	---	2.698	2.690	---	2.658	2.640	2.649	---
G_{sa} [A/(B+A-C)]	---	2.721	2.715	---	2.691	2.693	2.692	---

Combined Aggregate Specific Gravity

	Not Used	#1 Stone	#1A Stone	Not Used	Manufactured Sand	Screenings	RAP	Not Used
Combined G_{sb}	---	2.698	2.690	---	2.658	2.640	2.649	---
Combined G_{sa}	---	2.721	2.715	---	2.691	2.693	2.692	---

S. G. Technician:	Florin Niculescu	Date Tested:	2/8/2016

Combined Average Gradations, % Passing

Bin	Agg Blend	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#1 Stone	28.7%	28.7	28.7	28.7	28.5	4.2	0.6	0.6	0.6	0.6	0.6
#1A Stone	18.0%	18.0	18.0	18.0	18.0	16.0	4.3	2.9	2.9	2.9	2.9
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufactured Sand	23.3%	23.3	23.3	23.3	23.3	23.3	22.2	13.7	9.2	4.5	1.2
Screenings	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAP	30.0%	30.0	30.0	30.0	30.0	22.6	15.9	10.1	7.5	4.4	2.8
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0%	100.0	100.0	100.0	99.8	66.1	43.0	27.3	20.2	12.4	7.5
Specification Limits		100-100	100-100	100-100	95-100	58-72	36-54	15-32	8-25	4-16	2-6

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT TRIAL GRADATION WORKSHEET - 6F RA TOP MIX

PLANT NAME: FLUSHING ASPHALT | NYSDOT FACILITY #: H0239 | MIX DESIGN DATE: 2/11/2016

BATCH 1

Batch P_b: 4.5%
Batch Grams: 1225.0

Batch Weights, Retained on Sieve - Grams

Bin	Agg. Blend	Mix Blend	Batch Grams	Asph. Grams	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200	Pan	
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#1 Stone	28.7%	27.4%	335.8		0.0	0.0	0.0	2.4	284.7	41.6	0.0	0.0	0.0	0.0	7.1	335.8
#1A Stone	18.0%	17.2%	210.6		0.0	0.0	0.0	0.0	23.0	136.9	16.8	0.0	0.0	0.0	33.9	210.6
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufactured Sand	23.3%	22.3%	272.6		0.0	0.0	0.0	0.0	0.0	13.1	99.5	52.3	55.1	38.7	13.9	272.6
Screenings	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAP	30.0%	30.5%	373.4	22.4	0.0	0.0	0.0	0.0	92.6	83.3	71.3	33.2	38.1	20.2	12.3	373.4
Not Used	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virgin Asphalt		2.7%	32.7	32.7												32.7
Total Mix	100.0%	100.0%	1225.0	55.1	0.0	0.0	0.0	2.4	400.3	274.9	187.7	85.6	93.1	58.9	67.2	1225.0

4.50%

BATCH 2

Batch P_b: 5.0%
Batch Grams: 1225.0

Batch Weights, Retained on Sieve - Grams

Bin	Agg. Blend	Mix Blend	Batch Grams	Asph. Grams	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200	Pan	
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#1 Stone	28.7%	27.3%	334.0		0.0	0.0	0.0	2.3	283.2	41.4	0.0	0.0	0.0	0.0	7.0	334.0
#1A Stone	18.0%	17.1%	209.5		0.0	0.0	0.0	0.0	22.8	136.2	16.8	0.0	0.0	0.0	33.7	209.5
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufactured Sand	23.3%	22.1%	271.2		0.0	0.0	0.0	0.0	0.0	13.0	99.0	52.1	54.8	38.5	13.8	271.2
Screenings	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAP	30.0%	30.3%	371.4	22.3	0.0	0.0	0.0	0.0	92.1	82.8	70.9	33.1	37.9	20.1	12.3	371.4
Not Used	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virgin Asphalt		3.2%	39.0	39.0												39.0
Total Mix	100.0%	100.0%	1225.0	61.3	0.0	0.0	0.0	2.3	398.2	273.4	186.7	85.1	92.7	58.6	66.8	1225.0

5.00%

BATCH 3

Batch P_b: 5.5%
Batch Grams: 1225.0

Batch Weights, Retained on Sieve - Grams

Bin	Agg. Blend	Mix Blend	Batch Grams	Asph. Grams	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200	Pan	
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#1 Stone	28.7%	27.1%	332.2		0.0	0.0	0.0	2.3	281.7	41.2	0.0	0.0	0.0	0.0	7.0	332.2
#1A Stone	18.0%	17.0%	208.4		0.0	0.0	0.0	0.0	22.7	135.4	16.7	0.0	0.0	0.0	33.5	208.4
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufactured Sand	23.3%	22.0%	269.7		0.0	0.0	0.0	0.0	0.0	12.9	98.5	51.8	54.5	38.3	13.8	269.7
Screenings	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAP	30.0%	30.2%	369.5	22.2	0.0	0.0	0.0	0.0	91.6	82.4	70.6	32.9	37.7	20.0	12.2	369.5
Not Used	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virgin Asphalt		3.7%	45.2	45.2												45.2
Total Mix	100.0%	100.0%	1225.0	67.4	0.0	0.0	0.0	2.3	396.1	272.0	185.7	84.7	92.2	58.3	66.5	1225.0

5.50%

BATCH 4

Batch P_b: 6.0%
Batch Grams: 1225.0

Batch Weights, Retained on Sieve - Grams

Bin	Agg. Blend	Mix Blend	Batch Grams	Asph. Grams	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200	Pan	
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#1 Stone	28.7%	27.0%	330.5		0.0	0.0	0.0	2.3	280.2	41.0	0.0	0.0	0.0	0.0	6.9	330.5
#1A Stone	18.0%	16.9%	207.3		0.0	0.0	0.0	0.0	22.6	134.7	16.6	0.0	0.0	0.0	33.4	207.3
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufactured Sand	23.3%	21.9%	268.3		0.0	0.0	0.0	0.0	0.0	12.9	97.9	51.5	54.2	38.1	13.7	268.3
Screenings	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAP	30.0%	30.0%	367.5	22.1	0.0	0.0	0.0	0.0	91.1	82.0	70.2	32.7	37.5	19.8	12.1	367.5
Not Used	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virgin Asphalt		4.2%	51.5	51.5												51.5
Total Mix	100.0%	100.0%	1225.0	73.5	0.0	0.0	0.0	2.3	394.0	270.5	184.7	84.2	91.7	57.9	66.1	1225.0

6.00%

BATCH 5

Batch P_b: 6.5%
Batch Grams: 1225.0

Batch Weights, Retained on Sieve - Grams

Bin	Agg. Blend	Mix Blend	Batch Grams	Asph. Grams	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200	Pan	
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#1 Stone	28.7%	26.8%	328.7		0.0	0.0	0.0	2.3	278.8	40.8	0.0	0.0	0.0	0.0	6.9	328.7
#1A Stone	18.0%	16.8%	206.2		0.0	0.0	0.0	0.0	22.5	134.0	16.5	0.0	0.0	0.0	33.2	206.2
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufactured Sand	23.3%	21.8%	266.9		0.0	0.0	0.0	0.0	0.0	12.8	97.4	51.2	53.9	37.9	13.6	266.9
Screenings	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RAP	30.0%	29.8%	365.5	21.9	0.0	0.0	0.0	0.0	90.7	81.5	69.8	32.5	37.3	19.7	12.1	365.5
Not Used	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Virgin Asphalt		4.7%	57.7	57.7												57.7
Total Mix	100.0%	100.0%	1225.0	79.6	0.0	0.0	0.0	2.3	391.9	268.1	183.7	83.8	91.2	57.6	65.8	1225.0

6.50%

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT MAXIMUM DENSITY & MARSHALL PROPERTIES WORKSHEET - 6F RA TOP MIX

PLANT NAME: FLUSHING ASPHALT | NYSDOT FACILITY #: H0239 | MIX DESIGN DATE: 2/11/2016

Theoretical Maximum Specific Gravity G_{mm} per ASTM D2041

Trial Batch	1		2		3		4		5	
P_b	4.5%		5.0%		5.5%		6.0%		6.5%	
A) Sample in Air (grams)	2012.3	2011.7	2007.2	2015.8	1690.6	1760.1	2021.8	2010.4	2051.3	2032.4
B) Pycnometer in Water (Grams)	1288.8	1296.0	1288.8	1296.0	1288.8	1296.0	1288.8	1296.0	1288.8	1296.0
C) Sample & Pycnometer in Water (Grams)	2500.2	2508.3	2491.5	2502.5	2297.3	2346.8	2488.1	2489.2	2499.5	2493.8
G_{mm} (A/[A+B-C])	2.513	2.517	2.495	2.491	2.479	2.481	2.458	2.460	2.440	2.435
Average G_{mm}	2.515		2.493		2.480		2.459		2.438	

Density Technician: F.Niculescu | Date Tested: 2/8/2016

Computation of Marshall Mix Properties (75 Blows per Side)

	Weight In Air	SSD Weight	Weight In Water	Sample Volume	Bulk SG G_{mb}	Max SG G_{mm}	% Air P_a	Unit Weight	Meas. Stability	Corr. Factor	Corr. Stability	Marshall Flow	Marshall Quotient
	Grams	Grams	Grams	CC	—	—	%	PCF	lbs	lbs	lbs	0.01"	lb/0.01"
	A	B	C	D	E	F	G	H	J	K	L	M	N
	—	—	—	B-C	A/D	—	(F-E)/F	E*62.4	—	—	J*K	—	L/M
TRIAL BATCH 1			P_b = 4.5%										
Specimen A	1220.4	1222.2	700.1	522.1	2.337	2.515	7.06%		2500	1	2500	8.5	294
Specimen B	1218.0	1220.1	700.2	519.9	2.343	2.515	6.85%		2700	1	2700	9.0	300
Specimen C	1218.1	1220.3	700.1	520.2	2.342	2.515	6.89%		2575	1	2580	8.5	304
Average					2.341	2.515	6.92%	146.1			2590	8.7	299
TRIAL BATCH 2			P_b = 5.0%										
Specimen A	1223.1	1224.5	705.8	518.7	2.358	2.493	5.41%		2800	1	2800	9.0	311
Specimen B	1222.8	1224.6	705.2	519.4	2.354	2.493	5.57%		2850	1	2850	9.5	300
Specimen C	1224.0	1225.3	705.4	519.9	2.354	2.493	5.56%		2975	1	2980	9.5	314
Average					2.356	2.493	5.50%	147.0			2880	9.3	308
TRIAL BATCH 3			P_b = 5.5%										
Specimen A	1221.9	1222.8	708.9	513.9	2.378	2.480	4.13%		3375	1	3380	10.0	338
Specimen B	1226.3	1227.2	709.5	517.7	2.369	2.480	4.49%		3150	1	3150	10.5	300
Specimen C	1219.3	1220.4	708.2	512.2	2.381	2.480	4.01%		3075	1	3080	11.0	280
Average					2.376	2.480	4.19%	148.3			3200	10.5	306
TRIAL BATCH 4			P_b = 6.0%										
Specimen A	1238.7	1239.6	720.0	519.6	2.384	2.459	3.05%		2975	1	2980	11.0	271
Specimen B	1239.5	1240.4	719.8	520.6	2.381	2.459	3.18%		3000	1	3000	11.0	273
Specimen C	1239.8	1240.7	720.4	520.3	2.383	2.459	3.10%		2850	1	2850	11.5	248
Average					2.383	2.459	3.09%	148.7			2940	11.2	264
TRIAL BATCH 5			P_b = 6.5%										
Specimen A	1242.5	1242.9	723.2	519.7	2.391	2.438	1.94%		2675	1	2680	11.5	233
Specimen B	1242.8	1243.3	724.1	519.2	2.394	2.438	1.82%		2500	1	2500	12.0	208
Specimen C	1242.9	1243.5	723.9	519.6	2.392	2.438	1.89%		2475	1	2480	12.0	207
Average					2.392	2.438	1.89%	149.3			2550	11.8	216

Marshall Technician: F.Niculescu | Date Tested: 2/8/2016

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

MIX VOLUMETRIC PROPERTIES WORKSHEET - 6F RA TOP MIX

PLANT:	FLUSHING ASPHALT	NYSDOT FACILITY #:	H0239	MIX DESIGN DATE:	2/11/2016

Agg. Blend %	Constituent Material	NYSDOT Source	G_{sa}	G_{sb}	Total Mix Composition by Weight — Trial Batch 1	2	3	4	5
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
28.7%	#1 Stone	8-32R	2.721	2.698	27.4%	27.3%	27.1%	27.0%	26.8%
18.0%	#1A Stone	8-32R	2.715	2.690	17.2%	17.1%	17.0%	16.9%	16.8%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
23.3%	Manufactured Sand	8-32R	2.691	2.658	22.3%	22.1%	22.0%	21.9%	21.8%
0.0%	Screenings	8-32R	2.693	2.640	0.0%	0.0%	0.0%	0.0%	0.0%
30.0%	RAP		2.692	2.649	30.5%	30.3%	30.2%	30.0%	29.8%
0.0%	Not Used		---	---	0.0%	0.0%	0.0%	0.0%	0.0%
	Virgin Asphalt				2.7%	3.2%	3.7%	4.2%	4.7%
100.0%					100.0%	100.0%	100.0%	100.0%	100.0%

	Mix General Properties	Trial Batch 1	2	3	4	5
P_b	Percent Total Asphalt Binder, %	4.5%	5.0%	5.5%	6.0%	6.5%
P_{ba}	Percent Absorbed Asphalt Binder, %	0.36%	0.30%	0.40%	0.34%	0.29%
P_{be}	Percent Effective Asphalt Binder, %	4.16%	4.71%	5.12%	5.68%	6.23%
DP	Dust Proportion (0.6 - 1.2 desired)	0.6	0.6	0.7	0.8	0.8
G_{mm}	Mix Maximum Specific Gravity	2.515	2.493	2.480	2.459	2.438
G_{mb}	Mix Bulk Specific Gravity	2.341	2.356	2.376	2.383	2.392
G_{sb}	Aggregate Bulk Gravity	2.672	2.672	2.672	2.672	2.672
G_{se}	Aggregate Effective Gravity	2.697	2.693	2.700	2.696	2.692
G_{sa}	Aggregate Apparent Specific Gravity	2.704	2.704	2.704	2.704	2.704

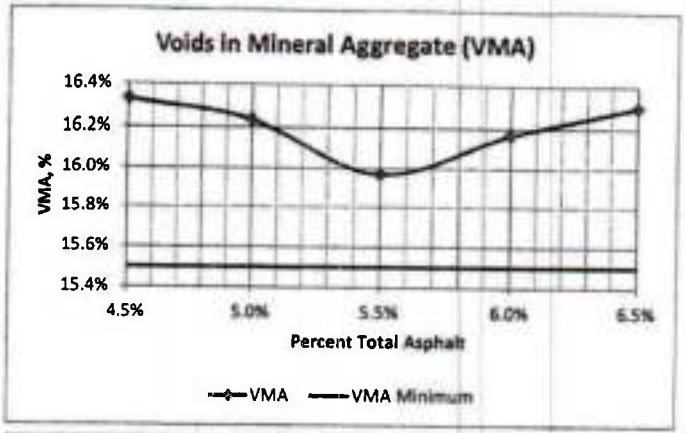
	Mix Acceptance Properties	Low Limit	High Limit	Trial Batch 1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	15.5%		16.3%	16.2%	16.0%	16.2%	16.3%
	Note: All five trial batches must meet the minimum VMA requirement.							
VFA	Voids Filled with Asphalt, %	65%	75%	57.6%	66.1%	73.8%	80.9%	88.4%
P_a	Percent Air Voids, %	3.0%	5.0%	6.9%	5.5%	4.2%	3.1%	1.9%
---	Marshall Stability (Corrected), lb	1500		2590	2880	3200	2940	2550
---	Marshall Flow, 0.01"	8	12	8.7	9.3	10.5	11.2	11.8
---	Marshall Quotient, lb/0.01"	150		299	308	306	264	216

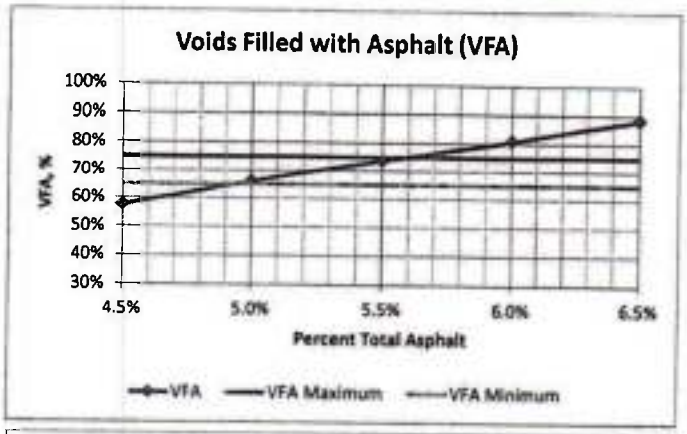
Department of Design and Construction

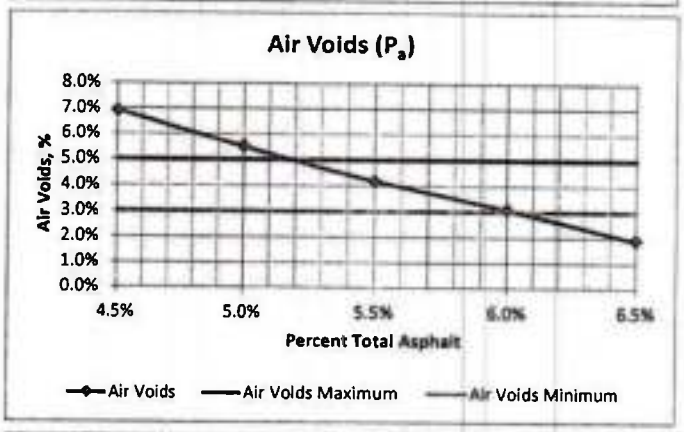
QA & CONSTRUCTION SAFETY BUREAU

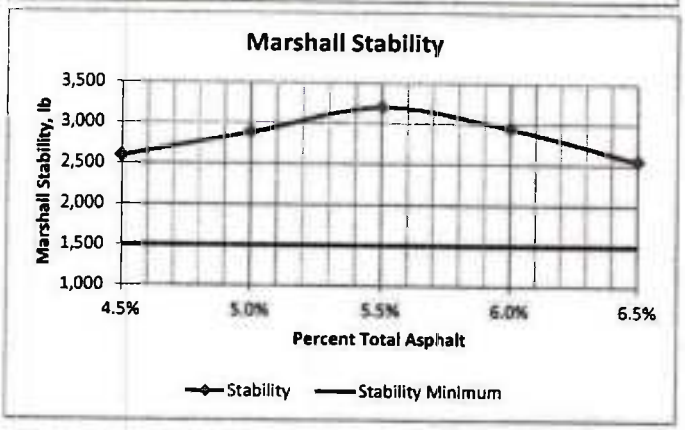
PROPERTY CURVES & DESIRED ASPHALT CONTENT WORKSHEET - 6F RA TOP MIX

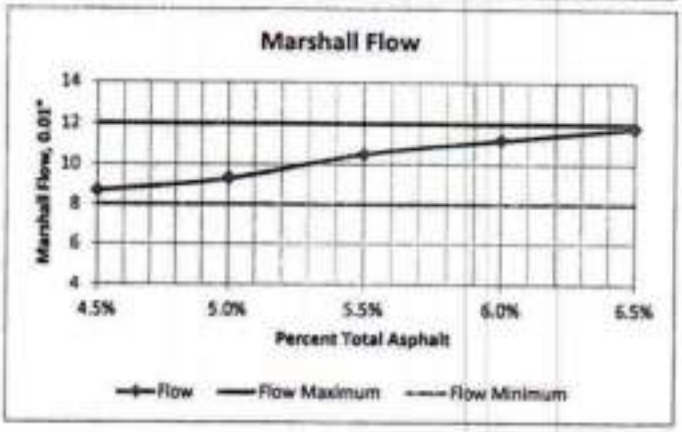
PLANT NAME: FLUSHING ASPHALT | NYSDOT FACILITY #: H0239 | MIX DESIGN DATE: 2/11/2016

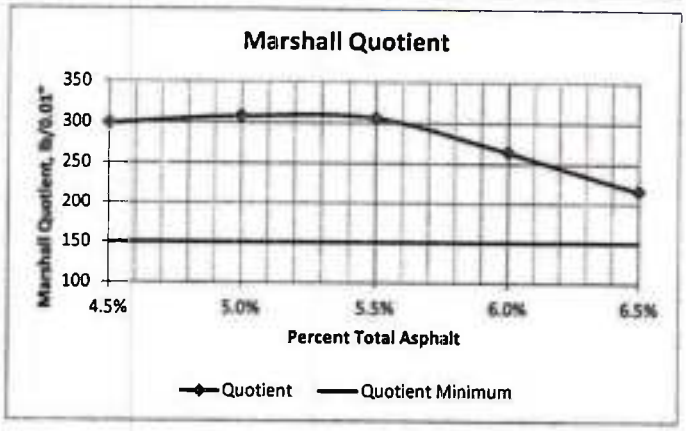












Property	High	Low
Voids in Mineral Aggregate (VMA), %	4.5%	6.5%
Voids Filled with Asphalt (VFA), %	5.6%	6.0%
Percent Air Voids, (P_a) %	5.7%	6.5%
Marshall Stability (Corrected), lb	4.5%	6.5%
Marshall Flow, 0.01"	4.5%	6.5%
Marshall Quotient, lb/0.01"	4.5%	6.5%
Overlap	5.7%	6.0%

Properties at Desired AC%
16.2%
80.9%
3.1%
2940
11.2
257.6

Midpoint	5.9%
Desired Total Asphalt Content P_b	6.0%

Desired Asphalt Content is the midpoint, unless the midpoint is on the VMA curve's positive slope.
If this is the case, the Desired Asphalt Content is as close as possible to the bottom of the VMA curve, within the Overlap Range.