



**Department of
Design and
Construction**

Lorraine Grillo
Commissioner

Safety & Site Support Division
Office of Quality Assurance

John M. DeVito, SCTPP
Director
Quality Assurance Unit

Concrete and Asphalt Generic Mix Design Approval # 2020 – 092

30-30 Thomson Avenue
Long Island City, NY 11101

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Date: 2/27/2020

To: Larry Santana,
Flushing Asphalt

From: John M. DeVito, Director
Quality Assurance

Date Submitted: 2/27/2020

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/009/20

Generic Mix Design – Mix Design Date: 2/12/2020

Generic Mix Design – Expiration Date: 2/28/2022 (See Comment 1 Below)

- 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:

Scott Cruz, QA Inspector

Recommended for Acceptance by:

Juan Martinez, PE, Deputy Director

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 6F RA TOP MIX

PLANT NAME: FLUSHING ASPHALT
 NYSDOT FACILITY #: H0239
 PLANT ADDRESS: FLUSHING
 New York, NY

MIX DESIGN DATE: 2/12/2020

PREPARED BY: FLORIN NICULESCU

COMPANY: FLUSHING ASPHALT

PLANT QC MGR: LARRY SANTANA

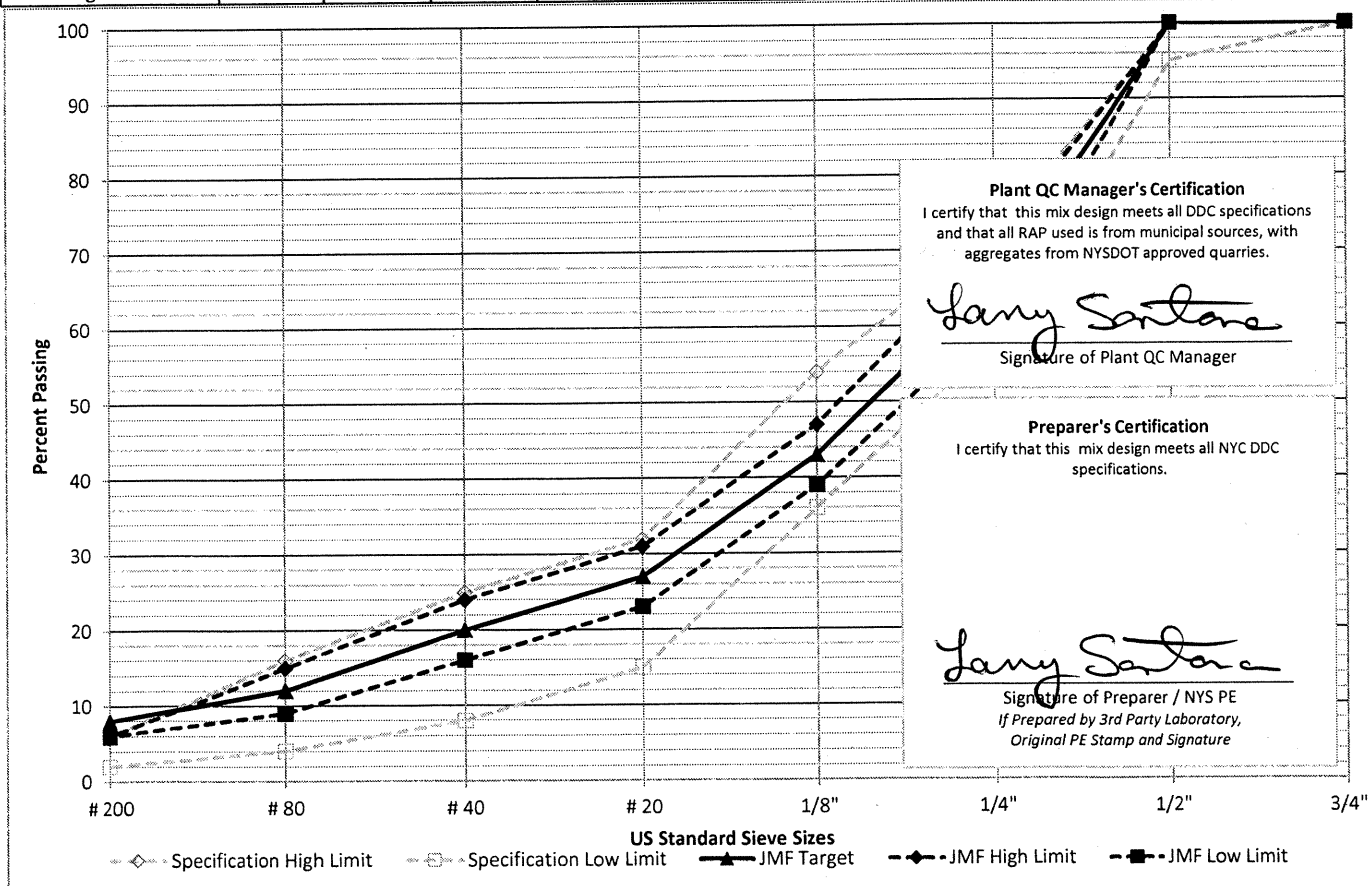
Item	Supplier / Quarry	NYSDOT Source	Friction Agg.	Agg. Blend %	Mix %	Lbs / Ton
					0.0%	0
#1 Stone	Tilcon, Mt Hope, NJ	8-32R	Yes	28.7%	27.7%	553
#1A Stone	Tilcon, Mt Hope, NJ	8-32R	Yes	18.0%	17.4%	347
					0.0%	0
Manufactured Sand	Tilcon, Mt Hope, NJ	8-32RFM	N/A	23.3%	22.5%	449
Screenings	Tilcon, Mt 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: 6.2%			RAP AC	1.8%	36
All RAP to be from Municipal Sources - Aggregates from State Quarries				RAP Aggregate	27.1%	542
		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)					5.4%	108
					100.0%	2,000

Project No: Generic
APPROVED
 NYCDDC (QA/QC BUREAU)
 Date: 2/24/20 Reviewed By: SC.
 LOG NO: 8020-092

QA/QC APPROVAL STAMP

FLUSHINGASPHALT/6FRA/TOP/Generic/NYCDDC/009/20 EXPIRES: 2/28/2022

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	5.4
JMF Range	100-100	100-100	100-100	100-100	61-71	39-47	23-31	16-24	9-15	6-6	5-6.1



QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 6F RA TOP MIX

PLANT NAME: FLUSHING ASPHALT
 NYSDOT FACILITY #: H0239
 PLANT ADDRESS: FLUSHING
 New York, NY

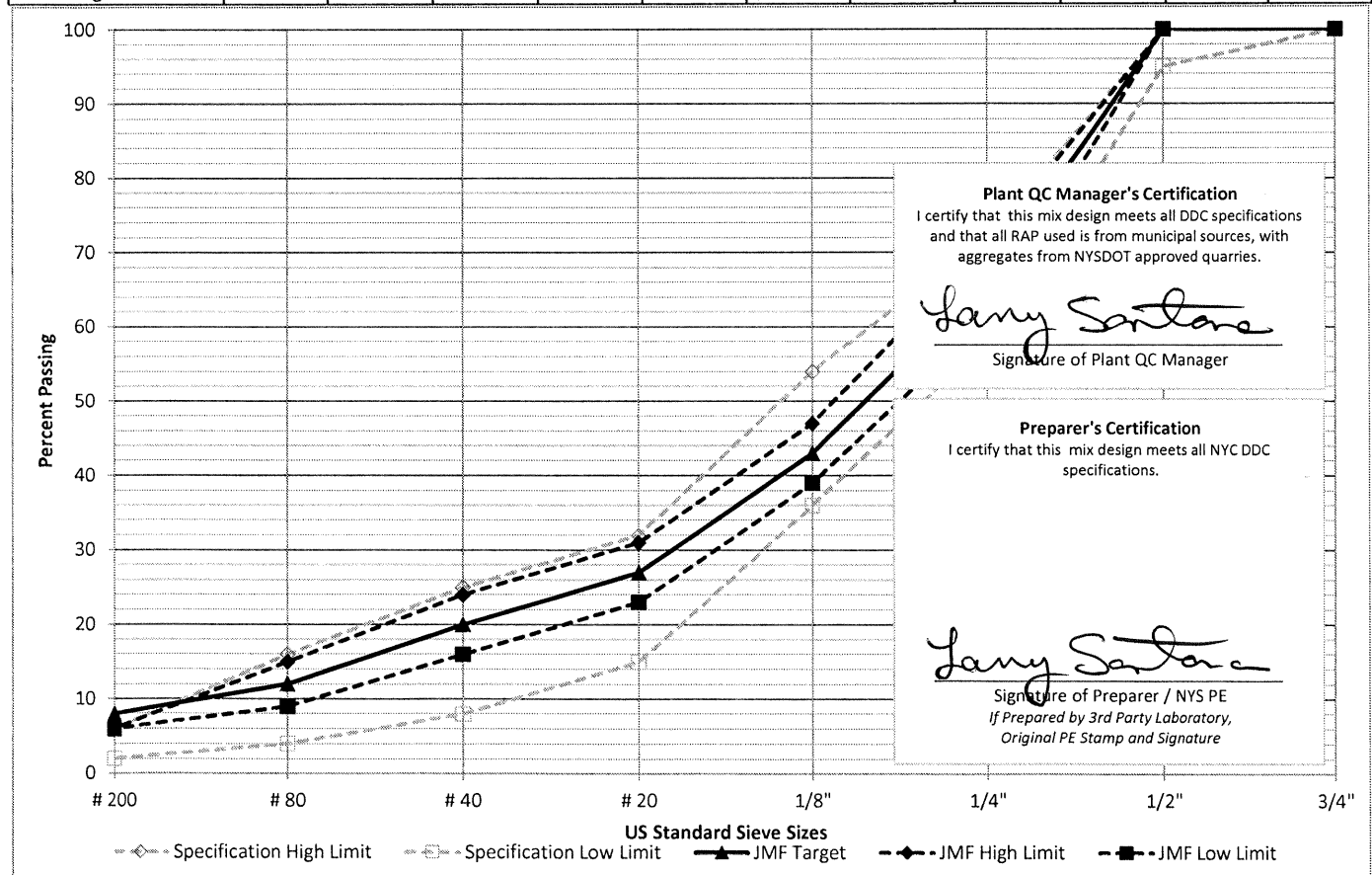
MIX DESIGN DATE: 2/12/2020
 PREPARED BY: FLORIN NICULESCU
 COMPANY: FLUSHING ASPHALT
 PLANT QC MGR: LARRY SANTANA

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	8-32RFM	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: 6.2%			RAP AC	1.8%	36
All RAP to be from Municipal Sources - Aggregates from State Quarries				RAP Aggregate	27.1%	542
		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)					5.4%	108
					100.0%	2,000

QA&CS APPROVAL STAMP

FLUSHING ASPHALT/6FRA/TOP/Generic/NYCDCC/009/20 EXPIRES: 2/28/2022

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	5.4
JMF Range	100-100	100-100	100-100	100-100	61-71	39-47	23-31	16-24	9-15	6-6	5-6.1



QA & CONSTRUCTION SAFETY BUREAU
ASPHALT COMBINED GRADATION WORKSHEET - 6F RA TOP MIX

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/12/2020

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	65.0	24.1		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: 2/10/2020

Gradation Technician: Florin Niculescu Date Tested: 2/10/2020

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: 2/10/2020

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

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT TRIAL GRADATION WORKSHEET - 6F RA TOP MIX

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/12/2020

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	0.0	7.1
#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	0.0	33.9
Not Used	0.0%	0.0%	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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%	374.2	23.2	0.0	0.0	0.0	0.0	92.8	83.4	71.5	33.3	38.2	20.2	11.6	374.2
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	0.0
Virgin Asphalt		2.6%	31.9	31.9												31.9
Total Mix	100.0%	100.0%	1225.0	55.1	0.0	0.0	0.0	2.4	400.5	275.0	187.8	85.6	93.2	58.9	66.5	1225.0

4.50%

BATCH 2		Batch P _b :	5.0%	Batch Weights, Retained on Sieve - Grams												
		Batch Grams:	1225.0													
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%	30.4%	372.2	23.1	0.0	0.0	0.0	0.0	92.3	83.0	71.1	33.1	38.0	20.1	11.5	372.2
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	0.0
Virgin Asphalt		3.1%	38.2	38.2												38.2
Total Mix	100.0%	100.0%	1225.0	61.3	0.0	0.0	0.0	2.3	398.4	273.6	186.8	85.2	92.7	58.6	66.1	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%	370.2	23.0	0.0	0.0	0.0	0.0	91.8	82.6	70.7	33.0	37.8	20.0	11.5	370.2
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	0.0
Virgin Asphalt		3.6%	44.4	44.4												44.4
Total Mix	100.0%	100.0%	1225.0	67.4	0.0	0.0	0.0	2.3	396.3	272.2	185.8	84.7	92.2	58.3	65.8	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%	30.1%	368.3	22.8	0.0	0.0	0.0	0.0	91.3	82.1	70.3	32.8	37.6	19.9	11.4	368.3
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	0.0
Virgin Asphalt		4.1%	50.7	50.7												50.7
Total Mix	100.0%	100.0%	1225.0	73.5	0.0	0.0	0.0	2.3	394.2	270.7	184.9	84.3	91.8	58.0	65.4	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%	29.9%	366.3	22.7	0.0	0.0	0.0	0.0	90.8	81.7	70.0	32.6	37.4	19.8	11.4	366.3
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	0.0
Virgin Asphalt		4.6%	56.9	56.9												56.9
Total Mix	100.0%	100.0%	1225.0	79.6	0.0	0.0	0.0	2.3	392.1	269.3	183.9	83.8	91.3	57.7	65.1	1225.0

6.50%

QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/12/2020

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: 2/10/2020

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: 2/10/2020

QA & CONSTRUCTION SAFETY BUREAU

MIX VOLUMETRIC PROPERTIES WORKSHEET - 6F RA TOP MIX

PLANT:	FLUSHING ASPHALT	NYSDOT FACILITY #:	H0239	MIX DESIGN DATE:	2/12/2020
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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	8-32RFM	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%	30.4%	30.2%	30.1%	29.9%
0.0%	Not Used		---	---	0.0%	0.0%	0.0%	0.0%	0.0%
	Virgin Asphalt				2.6%	3.1%	3.6%	4.1%	4.6%
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