



**Department of  
Design and  
Construction**

**E-MAILED**  
2-27-18 JY

Ana Barrio  
Acting Commissioner

Program Management Division  
QA and Construction Safety Bureau

John M. DeVito  
Director  
QA & Construction Safety

**Concrete and Asphalt Generic Mix Design Approval # 2018 - 095**

30-30 Thomson Avenue  
Long Island City, NY 11101

Tel. 718 / 391-1395  
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www.nyc.gov/buildnyc

**Date:** 2/26/2018

**To:** Larry Santana  
Flushing Asphalt

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

*Alla Byers*

**Date Submitted:** 2/20/2018

**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/008/18

**Generic Mix Design Date:** 2/8/2018

**Generic Mix Design Expiration Date:** 2/29/2020

- 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: Juan Martinez PE, QA Engineer

*Juan Martinez*

Recommended for Acceptance by: Carlos Ortiz, Deputy Director

*Carlos Ortiz* 2/27/18

# 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

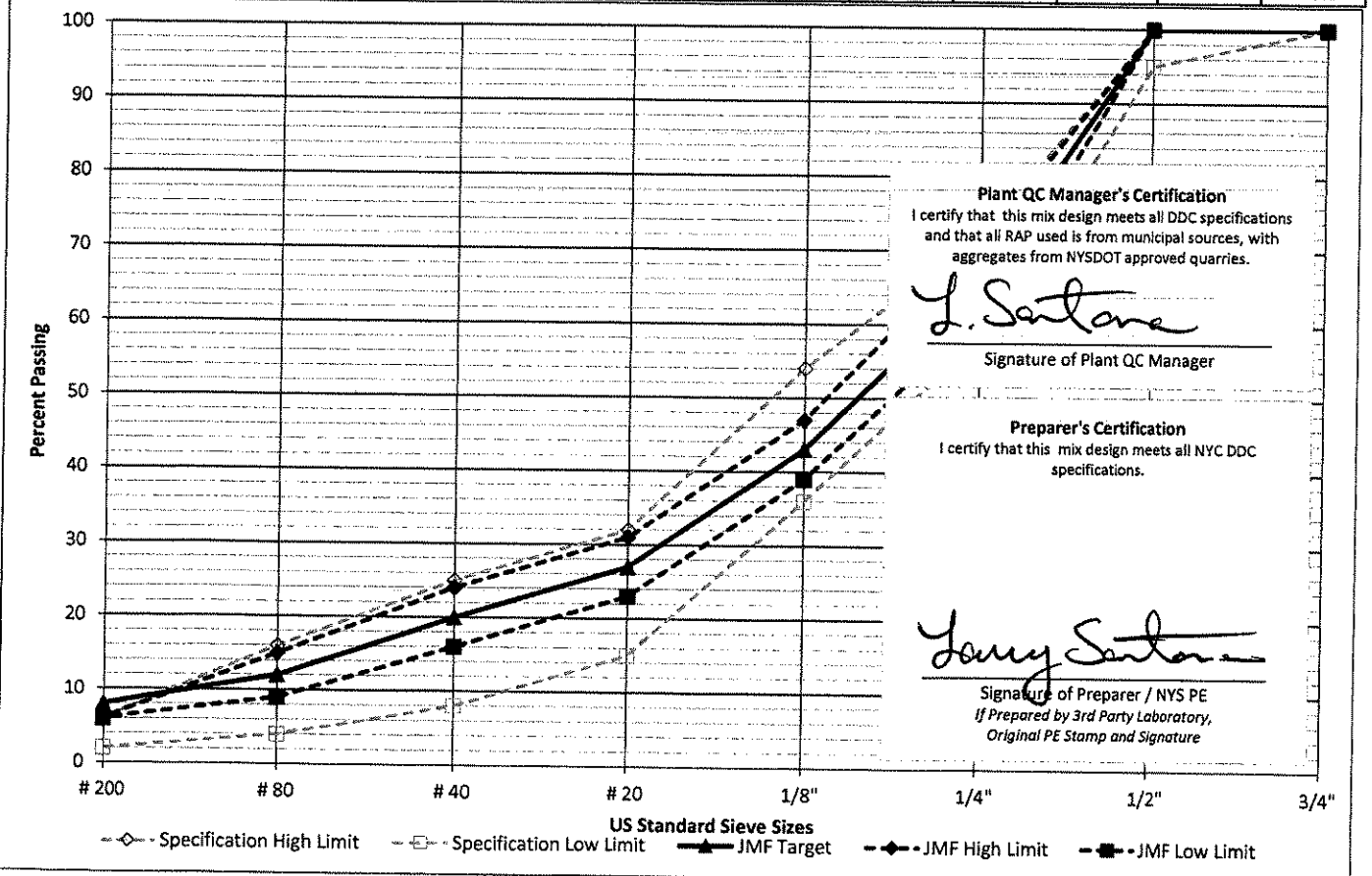
MIX DESIGN DATE: 2/8/2018  
 PREPARED BY: FLORIN NICULESCU  
 COMPANY: FLUSHING ASPHALT  
 PLANT QC MGR: LARRY SANTANA

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	8-32R	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: 6.2%			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 <sub>b</sub> ):	1.034		3.6%	72	
Total Asphalt Content (P <sub>b</sub> )					5.4%	108	
				100.0%	100.0%	2,000	

QABCS APPROVAL STAMP

FlushingAsphalt/6FRA/Top/Generic/NYCDCC/008/18 Exp: 2/29/20

Sieve Size	1-1/2"	1"	3/4"	1/2"	1/4"	1/8"	# 20	# 40	# 80	# 200	P <sub>b</sub>
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

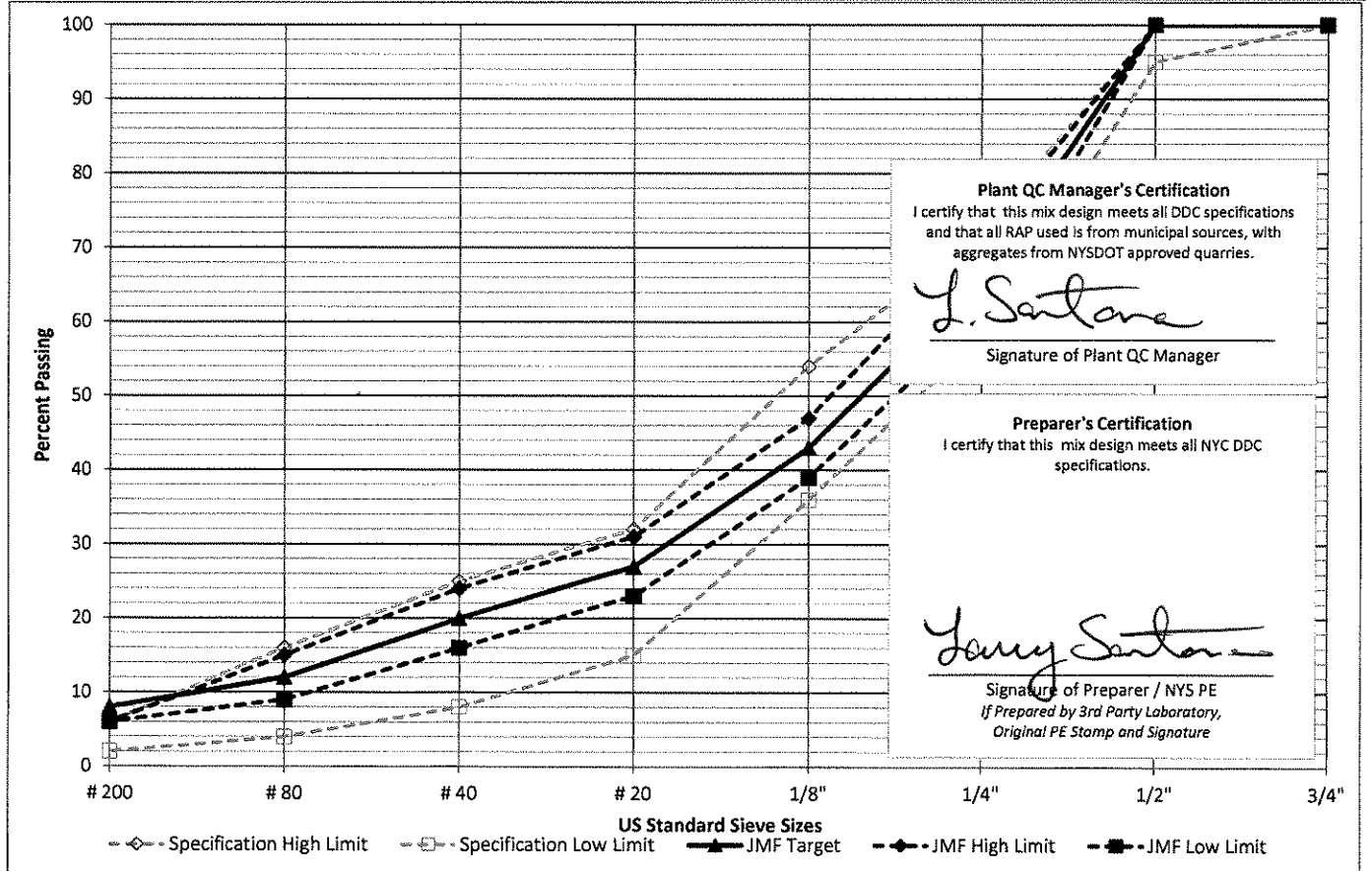
MIX DESIGN DATE: 2/8/2018  
 PREPARED BY: FLORIN NICULESCU  
 COMPANY: FLUSHING ASPHALT  
 PLANT QC MGR: LARRY SANTANA

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					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: 6.2%			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 <sub>b</sub> ):	1.034		3.6%	72
Total Asphalt Content (P <sub>b</sub> )					5.4%	108
					100.0%	2,000

Project No: **GENERIC**  
**APPROVED**  
 NYC DDC (QANCS BUREAU)  
 Date: 2-26-18 Reviewed By: *JM*  
 LOGNO: 2018-095  
 QA&CS APPROVAL STAMP

### FlushingAsphalt/6FRA/Top/Generic/NYCDDC/008/18 Exp: 2/29/20

Sieve Size	1-1/2"	1"	3/4"	1/2"	1/4"	1/8"	# 20	# 40	# 80	# 200	P <sub>b</sub>
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



PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/8/2018

**Average Bin Gradations**

Sieve	Not Used		#1 Stone		#1A Stone		Not Used		Manufactured Sand		Screenings		RAP		Not Used	
	% 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: 2/1/2018

Gradation Technician: Florin Niculescu Date Tested: 2/1/2018

**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 <sub>sb</sub> (A/(B-C))	---	2.698	2.690	---	---	---	2.649	---
G <sub>sa</sub> (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 <sub>sb</sub> (A/(B+S-C))	---	2.698	2.690	---	2.658	2.640	2.649	---
G <sub>sa</sub> (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 <sub>sb</sub>	---	2.698	2.690	---	2.658	2.640	2.649	---
Combined G <sub>sa</sub>	---	2.721	2.715	---	2.691	2.693	2.692	---

S. G. Technician: Florin Niculescu Date Tested: 2/2/2018

**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

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/8/2018

<b>BATCH 1</b>		Batch P <sub>c</sub> : 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			
#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			
#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			
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			
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			
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			
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			
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			
Virgin Asphalt		2.6%	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			

4.50%

<b>BATCH 2</b>		Batch P <sub>c</sub> : 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			
#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			
#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			
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			
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			
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			
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			
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			
Virgin Asphalt		3.1%	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			

5.00%

<b>BATCH 3</b>		Batch P <sub>c</sub> : 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			
#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			
#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			
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			
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			
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			
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			
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			
Virgin Asphalt		3.6%	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			

5.50%

<b>BATCH 4</b>		Batch P <sub>c</sub> : 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			
#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			
#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			
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			
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			
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			
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			
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			
Virgin Asphalt		4.1%	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			

6.00%

<b>BATCH 5</b>		Batch P <sub>c</sub> : 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			
#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			
#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			
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			
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			
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			
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			
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			
Virgin Asphalt		4.6%	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			

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: 2/8/2018

### 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: 2/2/2018

### 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: 2/2/2018

# QA & CONSTRUCTION SAFETY BUREAU

## MIX VOLUMETRIC PROPERTIES WORKSHEET - 6F RA TOP MIX

PLANT:	FLUSHING ASPHALT	NYSDOT FACILITY #:	H0239	MIX DESIGN DATE:	2/8/2018
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Agg. Blend %	Constituent Material	NYSDOT Source	G <sub>sa</sub>	G <sub>sb</sub>	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%	30.4%	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%

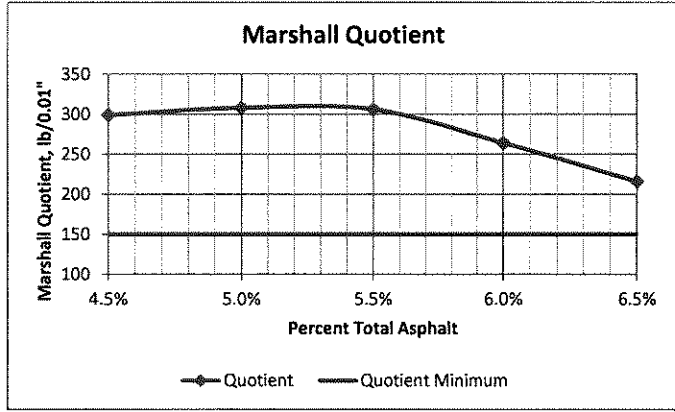
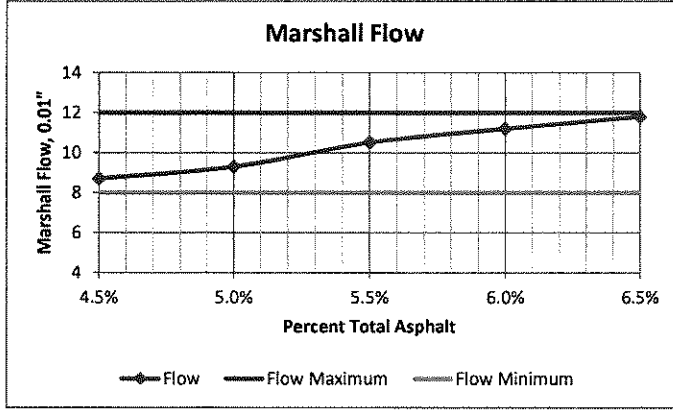
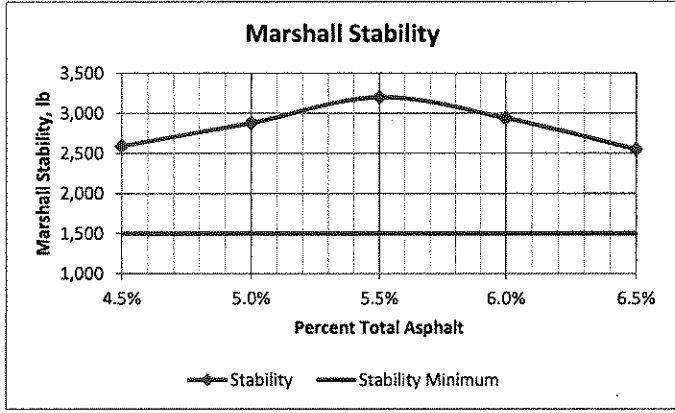
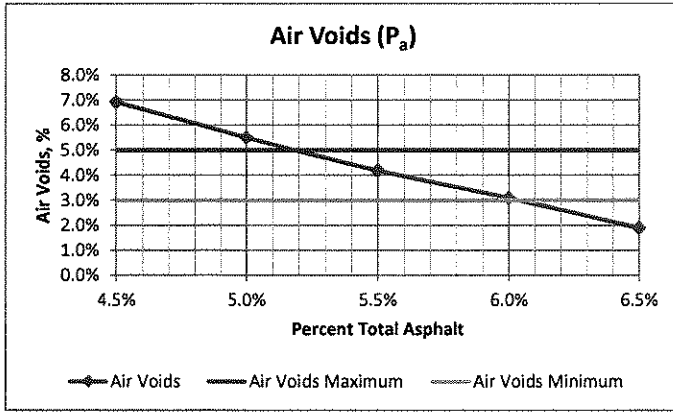
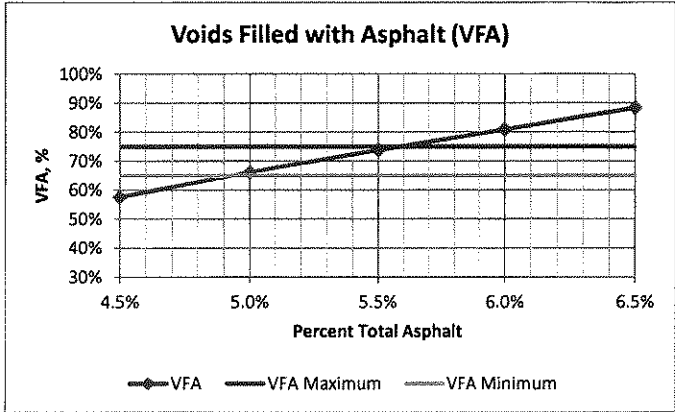
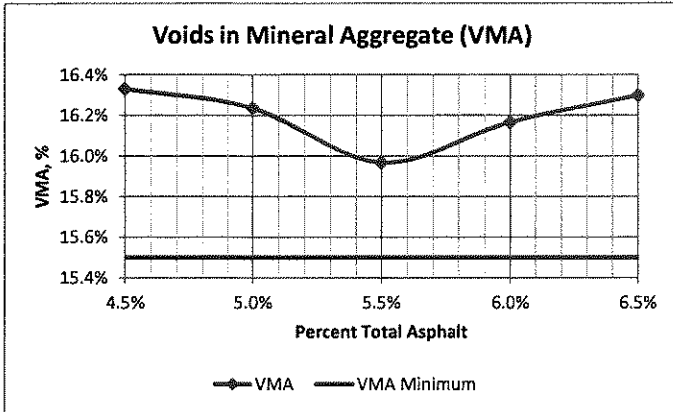
Mix General Properties				Trial Batch				
				1	2	3	4	5
P <sub>b</sub>	Percent Total Asphalt Binder, %			4.5%	5.0%	5.5%	6.0%	6.5%
P <sub>ba</sub>	Percent Absorbed Asphalt Binder, %			0.36%	0.30%	0.40%	0.34%	0.29%
P <sub>be</sub>	Percent Effective Asphalt Binder, %			4.16%	4.71%	5.12%	5.68%	6.23%
DP	Dust Proportion (0.6 - 1.2 desired)			0.6	0.6	0.7	0.8	0.8
G <sub>mm</sub>	Mix Maximum Specific Gravity			2.515	2.493	2.480	2.459	2.438
G <sub>mb</sub>	Mix Bulk Specific Gravity			2.341	2.356	2.376	2.383	2.392
G <sub>sb</sub>	Aggregate Bulk Gravity			2.672	2.672	2.672	2.672	2.672
G <sub>se</sub>	Aggregate Effective Gravity			2.697	2.693	2.700	2.696	2.692
G <sub>sa</sub>	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%
<i>Note: All five trial batches must meet the minimum VMA requirement.</i>								
VFA	Voids Filled with Asphalt, %	65%	75%	57.6%	66.1%	73.8%	80.9%	88.4%
P <sub>a</sub>	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

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/8/2018



Property	High	Low
Voids in Mineral Aggregate (VMA), %	4.5%	5.5%
Voids Filled with Asphalt (VFA), %	5.6% 4.5%	5.5% 5.0%
Percent Air Voids, (P <sub>a</sub> ) %	5.2% 4.5%	5.0% 6.0%
Marshall Stability (Corrected), lb	5.5% 4.5%	6.5%
Marshall Flow, 0.01"	6.5% 4.5%	6.5% 4.5%
Marshall Quotient, lb/0.01"	5.4% 4.5%	6.5%
Overlap	4.5%	6.5%

Properties at Desired AC%
16.2%
71.8%
4.6%
2830
10.1
282.8

Midpoint 5.5%

Desired Total Asphalt Content P<sub>b</sub> 5.4%

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.