



**Department of  
Design and  
Construction**

**E-MAILED**  
3-7-18 JM

**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 - 115**

30-30 Thomson Avenue  
Long Island City, NY 11101

Tel. 718 / 391-1395  
Fax 718 / 391-2885  
www.nyc.gov/buildnyc

**Date:** 3/6/2018  
**To:** Larry Santana  
Flushing Asphalt  
**From:** John M. DeVito, Director  
QA & Construction Safety Bureau

**Date Submitted:** 3/6/2018

**Plant:** Flushing Asphalt

**NYSDOT Facility Numbers:** H0239

**Laboratory:** N/A

**Mix Design Type:** 3RA Binder

**Generic Mix Design Serial Number:** FlushingAsphalt/3RA/Binder/Generic/NYCDDC/010/18

**Generic Mix Design Date:** 2/7/2018

**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

Recommended for Acceptance by: Carlos Ortiz, Deputy Director

# QA & CONSTRUCTION SAFETY BUREAU

## ASPHALT JOB MIX FORMULA SHEET - 3 RA BINDER MIX

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

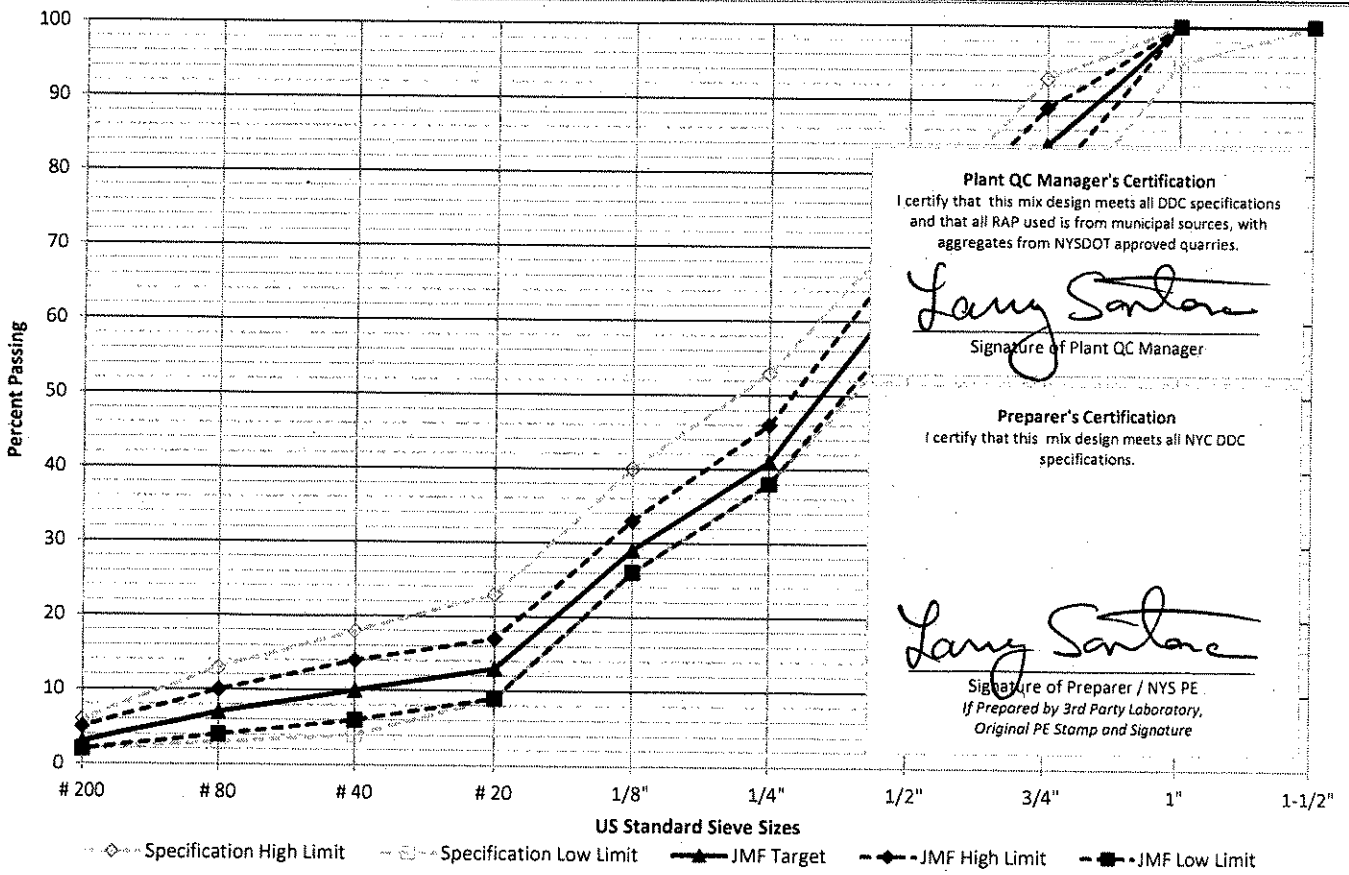
MIX DESIGN DATE: **2/7/2018**  
 PREPARED BY: **Florin Niculescu**  
 COMPANY: **FLUSHING ASPHALT**  
 PLANT QC MGR: **LARRY SANTANA**

Item	Supplier / Quarry	NYSDOT Source	High Friction	Agg. Blend %	Mix %	Lbs / Ton	
					0.0%	0	
#57 Stone	Tilcon, Mt Hope, NJ	8-32R	Yes	46.0%	44.8%	895	
#8 Stone	Tilcon, Mt Hope, NJ	8-32R	Yes	10.0%	9.7%	195	
					0.0%	0	
Natural Sand	Tilcon, Mt Hope, NJ	8-32R	N/A	0.0%	0.0%	0	
Manuf. Sand	Tilcon, Mt Hope, NJ	8-32RFM	N/A	14.0%	13.6%	272	
RAP 1	Flushing Asphalt Co.	N/A	Yes	30.0%	29.2%	584	
	RAP % Asphalt: 6.2%			RAP AC	1.8%	36	
<i>All RAP to be from Municipal Sources - Aggregates from State Quarries</i>					RAP Aggregate	27.4%	548
		N/A			0.0%	0	
	RAP % Asphalt: 0.0%			RAP AC	0.0%	0	
<i>All RAP to be from Municipal Sources - Aggregates from State Quarries</i>					RAP Aggregate	0.0%	0
Virgin Asphalt	Grade: PG64-22	SG (G <sub>b</sub> ):	1.034		2.7%	54	
Total Asphalt Content (P <sub>b</sub> ):					4.5%	90	
				100.0%	100.0%	2,000	

QA&CS APPROVAL STAMP

**Flushing Asphalt/3RA/Binder/Generic/NYCDDC/010/18 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	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6	4-6
JMF Target	100	100	84	65	41	29	13	10	7	3	4.5
JMF Range	100-100	100-100	79-89	60-70	38-46	26-33	9-17	6-14	4-10	2-5	4-5.2



# QA & CONSTRUCTION SAFETY BUREAU

## ASPHALT JOB MIX FORMULA SHEET - 3 RA BINDER MIX

PLANT NAME: **FLUSHING ASPHALT**  
 NYSDOT FACILITY #: **H0239**  
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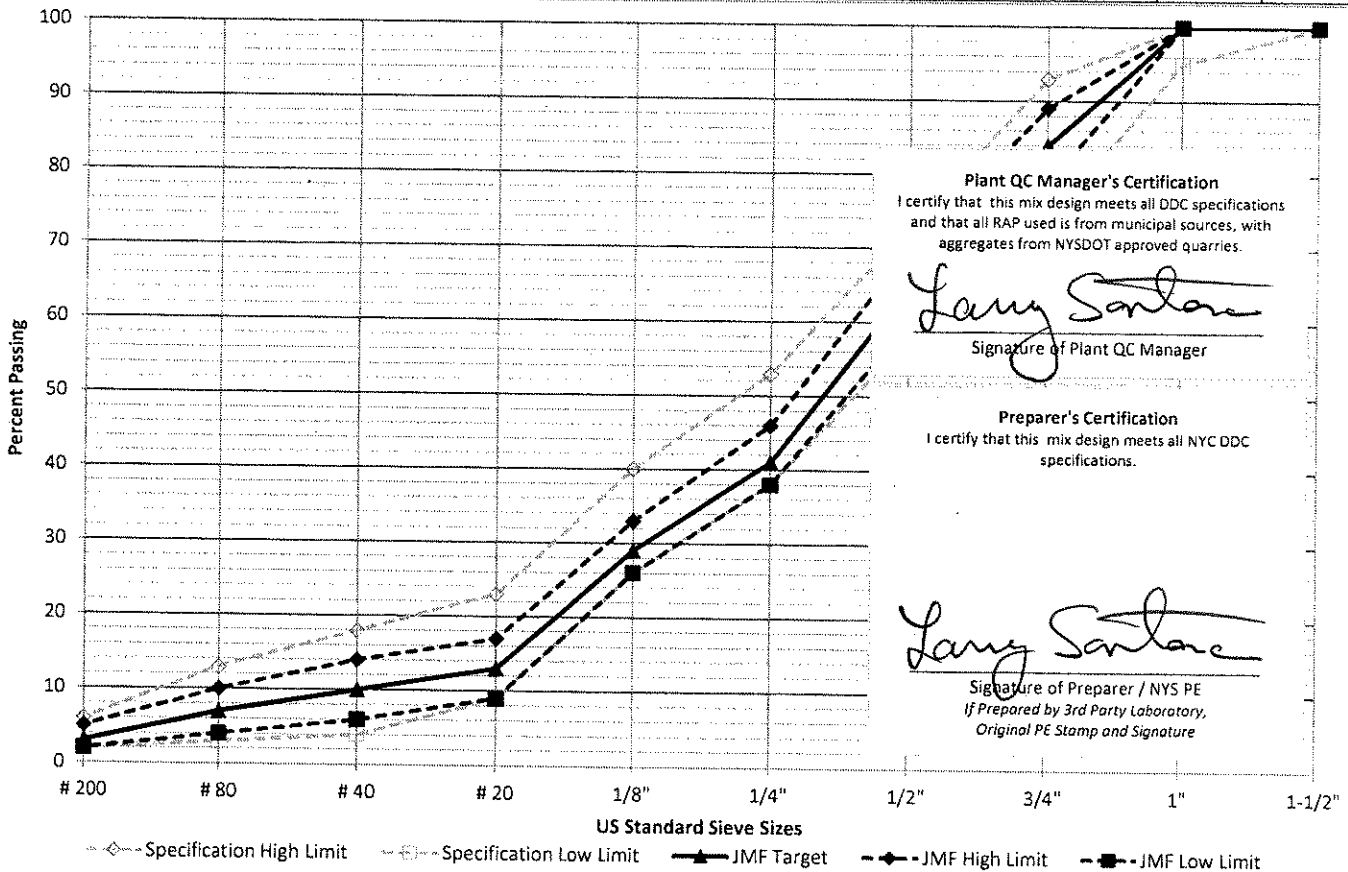
MIX DESIGN DATE: **2/7/2018**  
 PREPARED BY: **Florin Niculescu**  
 COMPANY: **FLUSHING ASPHALT**  
 PLANT QC MGR: **LARRY SANTANA**

Item	Supplier / Quarry	NYSDOT Source	High Friction	Agg. Blend %	Mix %	Lbs / Ton	
					0.0%	0	
#57 Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	46.0%	44.8%	895	
#8 Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	10.0%	9.7%	195	
					0.0%	0	
Natural Sand	Tilcon, Mt Hope,NJ	8-32R	N/A	0.0%	0.0%	0	
Manuf. Sand	Tilcon, Mt Hope,NJ	8-32RFM	N/A	14.0%	13.6%	272	
RAP 1	Flushing Asphalt Co.	N/A	Yes	30.0%	29.2%	584	
	RAP % Asphalt: 6.2%			RAP AC	1.8%	36	
All RAP to be from Municipal Sources - Aggregates from State Quarries					RAP Aggregate	27.4%	548
		N/A			0.0%	0	
	RAP % Asphalt: 0.0%			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		2.7%	54	
Total Asphalt Content (P <sub>b</sub> ):					4.5%	90	
					100.0%	2,000	

Project No: **GENERIC**  
**APPROVED**  
 NYC DDC (QA/QCS BUREAU)  
 Date: **3-6-18** Reviewed By: **34**  
 LOG NO: **2018-115**  
 QA/QCS APPROVAL STAMP

**Flushing Asphalt/3RA/Binder/Generic/NYCDDC/010/18 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	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6	4-6
JMF Target	100	100	84	65	41	29	13	10	7	3	4.5
JMF Range	100-100	100-100	79-89	60-70	38-46	26-33	9-17	6-14	4-10	2-5	4-5.2



# QA & CONSTRUCTION SAFETY BUREAU

## AGGREGATE SPECIFIC GRAVITY & COMBINED GRADATION WORKSHEET - 3 RA BINDER MIX

PLANT NAME: FLUSHING ASPHALT

NYSOOT FACILITY #: H0239

MIX DESIGN DATE: 2/7/2018

### Average Bin Gradations

Sieve	Not Used		#57 Stone		#8 Stone		Not Used		Natural Sand		Manuf. Sand		RAP 1		Not Used	
	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass
1.5"		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"		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	35.0	65.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0	0.0	100.0		100.0
1/2"		100.0	40.2	24.8	1.6	98.4		100.0	0.0	100.0	0.0	100.0	0.0	100.0		100.0
1/4"		100.0	18.8	6.0	64.6	33.8		100.0	0.0	100.0	0.0	100.0	29.8	70.2		100.0
1/8"		100.0	3.2	2.8	28.6	5.2		100.0	0.0	100.0	9.9	90.1	21.6	48.6		100.0
#20		100.0	2.8	0.0	5.2	0.0		100.0	0.0	100.0	44.9	45.2	26.3	22.3		100.0
#40		100.0	0.0	0.0	0.0	0.0		100.0	0.0	100.0	14.7	30.5	4.2	18.1		100.0
#80		100.0	0.0	0.0	0.0	0.0		100.0	0.0	100.0	14.9	15.6	3.4	14.7		100.0
#200		100.0	0.0	0.0	0.0	0.0		100.0	0.0	100.0	12.4	3.2	5.6	9.1		100.0
Pan			0.0		0.0				0.0		3.2		9.1			
Totals	0.0		100.0		100.0		0.0		0.0		100.0		100.0		0.0	

Stockpiles Sampled By: F.Niculescu Date Sampled: 2/5/2018

Gradation Technician: F.Niculescu Date Tested: 2/5/2018

### 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	#57 Stone	#8 Stone	Not Used	Natural Sand	Manuf. Sand	RAP 1	Not Used
% Coarse Agg.	---	94.0%	66.2%	---	0.0%	0.0%	29.8%	---
Test Required?	NO	YES	YES	NO	NO	NO	YES	NO
A) Wt. in Air		2655.3	2650.1				1023.4	
B) Wt. SSD		2670.5	2670.0				1029.6	
C) Wt. in Water		1688.2	1682.0				643.2	
G <sub>sb</sub> (A/(B-C))	---	2.703	2.682	---	---	---	2.649	---
G <sub>sa</sub> (A/(A-C))	---	2.746	2.737	---	---	---	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	#57 Stone	#8 Stone	Not Used	Natural Sand	Manuf. Sand	RAP 1	Not Used
% Fine Agg.	---	6.0%	33.8%	---	100.0%	100.0%	70.2%	---
Test Required?	NO	NO	YES	NO	YES	YES	YES	NO
A) Wt. in Air		0.0	2650.1		497.8	497.8	1023.4	
B) Wt. Flask + Water		0.0	0.0		680.0	680.0	0.0	
C) Wt. Flask + Water + Sample		0.0	1682.0		992.8	992.8	643.2	
S) Wt. SSD		0.0	2670.0		500.1	500.1	1029.6	
G <sub>sb</sub> (A/(B+S-C))	---	---	2.682	---	2.658	2.658	2.649	---
G <sub>sa</sub> (A/(B+A-C))	---	---	2.737	---	2.691	2.691	2.692	---

### Combined Aggregate Specific Gravity

	Not Used	#57 Stone	#8 Stone	Not Used	Natural Sand	Manuf. Sand	RAP 1	Not Used
Combined G <sub>sb</sub>	---	2.703	2.682	---	2.658	2.658	2.649	---
Combined G <sub>sa</sub>	---	2.746	2.737	---	2.691	2.691	2.692	---

S. G. Technician: F.Niculescu Date Tested: 2/5/2018

### 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
#57 Stone	46.0%	46.0	46.0	29.9	11.4	2.8	1.3	0.0	0.0	0.0	0.0
#8 Stone	10.0%	10.0	10.0	10.0	9.8	3.4	0.5	0.0	0.0	0.0	0.0
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Sand	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manuf. Sand	14.0%	14.0	14.0	14.0	14.0	14.0	12.6	6.3	4.3	2.2	0.4
RAP 1	30.0%	30.0	30.0	30.0	30.0	21.1	14.6	6.7	5.4	4.4	2.7
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0%	100.0	100.0	83.9	65.2	41.2	29.0	13.0	9.7	6.6	3.2
Specification Limits		100-100	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6

QA & CONSTRUCTION SAFETY BUREAU  
 ASPHALT TRIAL GRADATION WORKSHEET - 3 RA BINDER MIX

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/7/2018

BATCH 1		Batch P <sub>b</sub> :	3.5%	Batch Weights, Retained on Sieve - Grams																
		Batch Grams:	1280.0	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	0.0	0.0	0.0	0.0
#57 Stone		46.0%	44.4%	568.2	0.0	0.0	198.9	228.4	106.8	18.2	15.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#8 Stone		10.0%	9.7%	123.5	0.0	0.0	0.0	2.0	79.8	35.3	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0
Natural Sand		0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manuf. Sand		14.0%	13.5%	172.9	0.0	0.0	0.0	0.0	0.0	17.1	77.6	25.4	25.8	21.4	5.5					
RAP 1		30.0%	30.9%	395.1	24.5	0.0	0.0	0.0	0.0	117.7	85.3	103.9	16.6	13.4	22.1	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	0.0	0.0	0.0	0.0
Virgin Asphalt			1.6%	20.3	20.3															
Total Mix		100.0%	100.0%	1280.0	44.8	0.0	0.0	198.9	230.4	304.3	156.0	203.9	42.0	39.2	43.6	17.0				

3.50%

BATCH 2		Batch P <sub>b</sub> :	4.0%	Batch Weights, Retained on Sieve - Grams																
		Batch Grams:	1280.0	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	0.0	0.0	0.0	0.0
#57 Stone		46.0%	44.2%	565.2	0.0	0.0	197.8	227.2	106.3	18.1	15.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#8 Stone		10.0%	9.6%	122.9	0.0	0.0	0.0	2.0	79.4	35.1	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0
Natural Sand		0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manuf. Sand		14.0%	13.4%	172.0	0.0	0.0	0.0	0.0	0.0	17.0	77.2	25.3	25.6	21.3	5.5					
RAP 1		30.0%	30.7%	393.0	24.4	0.0	0.0	0.0	0.0	117.1	84.9	103.4	16.5	13.4	22.0	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	0.0	0.0	0.0	0.0
Virgin Asphalt			2.1%	26.8	26.8															
Total Mix		100.0%	100.0%	1280.0	51.2	0.0	0.0	197.8	229.2	302.8	155.2	202.8	41.8	39.0	43.3	16.9				

4.00%

BATCH 3		Batch P <sub>b</sub> :	4.5%	Batch Weights, Retained on Sieve - Grams																
		Batch Grams:	1280.0	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	0.0	0.0	0.0	0.0
#57 Stone		46.0%	43.9%	562.3	0.0	0.0	196.8	226.0	105.7	18.0	15.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#8 Stone		10.0%	9.6%	122.2	0.0	0.0	0.0	2.0	79.0	35.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0
Natural Sand		0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manuf. Sand		14.0%	13.4%	171.1	0.0	0.0	0.0	0.0	0.0	16.9	76.8	25.2	25.5	21.2	5.5					
RAP 1		30.0%	30.5%	391.0	24.2	0.0	0.0	0.0	0.0	116.5	84.4	102.8	16.4	13.3	21.9	11.3				
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	0.0	0.0	0.0
Virgin Asphalt			2.6%	33.4	33.4															
Total Mix		100.0%	100.0%	1280.0	57.6	0.0	0.0	196.8	228.0	301.2	154.3	201.8	41.6	38.8	43.1	16.8				

4.50%

BATCH 4		Batch P <sub>b</sub> :	5.0%	Batch Weights, Retained on Sieve - Grams																
		Batch Grams:	1280.0	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	0.0	0.0	0.0	0.0
#57 Stone		46.0%	43.7%	559.4	0.0	0.0	195.8	224.9	105.2	17.9	15.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#8 Stone		10.0%	9.5%	121.6	0.0	0.0	0.0	1.9	78.6	34.8	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0
Natural Sand		0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manuf. Sand		14.0%	13.3%	170.2	0.0	0.0	0.0	0.0	0.0	16.9	76.4	25.0	25.4	21.1	5.4					
RAP 1		30.0%	30.4%	388.9	24.1	0.0	0.0	0.0	0.0	115.9	84.0	102.3	16.3	13.2	21.8	11.3				
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	0.0	0.0	0.0
Virgin Asphalt			3.1%	39.9	39.9															
Total Mix		100.0%	100.0%	1280.0	64.0	0.0	0.0	195.8	226.8	299.6	153.5	200.7	41.4	38.6	42.9	16.7				

5.00%

BATCH 5		Batch P <sub>b</sub> :	5.5%	Batch Weights, Retained on Sieve - Grams																
		Batch Grams:	1280.0	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	0.0	0.0	0.0	0.0
#57 Stone		46.0%	43.5%	556.4	0.0	0.0	194.7	223.7	104.6	17.8	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#8 Stone		10.0%	9.5%	121.0	0.0	0.0	0.0	1.9	78.1	34.6	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	0.0
Natural Sand		0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manuf. Sand		14.0%	13.2%	169.3	0.0	0.0	0.0	0.0	0.0	16.8	76.0	24.9	25.2	21.0	5.4					
RAP 1		30.0%	30.2%	386.9	24.0	0.0	0.0	0.0	0.0	115.3	83.6	101.7	16.2	13.2	21.7	11.2				
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	0.0	0.0	0.0
Virgin Asphalt			3.6%	46.4	46.4															
Total Mix		100.0%	100.0%	1280.0	70.4	0.0	0.0	194.7	225.6	298.0	152.7	199.7	41.1	38.4	42.7	16.6				

5.50%

# QA & CONSTRUCTION SAFETY BUREAU

## ASPHALT MAXIMUM DENSITY & MARSHALL PROPERTIES WORKSHEET - 3 RA BINDER MIX

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/7/2018

### Theoretical Maximum Specific Gravity $G_{mm}$ per ASTM D2041

Trial Batch	1		2		3		4		5	
$P_b$	3.5%		4.0%		4.5%		5.0%		5.5%	
A) Sample in Air (grams)	2068.3	2135.6	2145.3	2188.4	2112.3	2055.1	2133.2	2030.4	2100.2	2158.9
B) Pycnometer in Water (Grams)	7408.2	7300.9	7408.2	7300.9	7408.2	7300.9	7408.2	7300.9	7408.2	7300.9
C) Sample & Pycnometer in Water (Grams)	8668.8	8604.1	8711.2	8630.1	8683.1	8540.6	8689.2	8520.4	8662.5	8592.3
$G_{mm} (A/(A+B-C))$	2.561	2.566	2.547	2.547	2.522	2.520	2.503	2.504	2.483	2.489
Average $G_{mm}$	2.563		2.547		2.521		2.504		2.486	

Density Technician: F.Niculescu Date Tested: 2/6/2018

### 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		$P_b = 3.5\%$										
Specimen A	1240.8	1242.2	723.9	518.3	2.394	2.563	6.6%	2400	1	2400	8.5	282
Specimen B	1240.5	1242.5	724.1	518.4	2.393	2.563	6.6%		1	2500	9.0	278
Specimen C	1241.1	1243.6	724.3	519.3	2.390	2.563	6.8%		1	2350	8.5	276
Average					2.392	2.563	6.7%	149.3		2420	8.7	279

TRIAL BATCH 2		$P_b = 4.0\%$										
Specimen A	1239.9	1241.9	724.1	517.8	2.395	2.547	6.0%	2700	1	2700	10.5	257
Specimen B	1238.7	1240.5	724.4	516.1	2.400	2.547	5.8%		1	2650	9.5	279
Specimen C	1238.2	1240.7	725.1	515.6	2.401	2.547	5.7%		1	2750	9.5	289
Average					2.399	2.547	5.8%	149.7		2700	9.8	275

TRIAL BATCH 3		$P_b = 4.5\%$										
Specimen A	1242.8	1244.5	731.3	513.2	2.422	2.521	3.9%	2850	1	2850	10.5	271
Specimen B	1241.1	1243.1	730.2	512.9	2.420	2.521	4.0%		1	2900	11.0	264
Specimen C	1240.6	1243.0	730.1	512.9	2.419	2.521	4.1%		1	2900	10.5	276
Average					2.420	2.521	4.0%	151.0		2880	10.7	270

TRIAL BATCH 4		$P_b = 5.0\%$										
Specimen A	1244.3	1245.6	732.1	513.5	2.423	2.504	3.2%	2650	1	2650	11.0	241
Specimen B	1245.1	1246.7	733.1	513.6	2.424	2.504	3.2%		1	2700	11.5	235
Specimen C	1243.7	1245.1	733.9	511.2	2.433	2.504	2.8%		1	2600	11.5	226
Average					2.427	2.504	3.1%	151.4		2650	11.3	234

TRIAL BATCH 5		$P_b = 5.5\%$										
Specimen A	1242.8	1243.9	735.8	508.1	2.446	2.486	1.6%	2300	1.04	2390	11.5	208
Specimen B	1245.1	1245.3	734.5	510.8	2.438	2.486	1.9%		1	2250	12.5	180
Specimen C	1245.2	1246.4	734.1	512.3	2.431	2.486	2.2%		1	2250	12.0	188
Average					2.438	2.486	1.9%	152.1		2300	12.0	192

Marshall Technician: F.Niculescu Date Tested: 2/6/2018

**QA & CONSTRUCTION SAFETY BUREAU**  
**MIX VOLUMETRIC PROPERTIES WORKSHEET - 3 RA BINDER MIX**

PLANT:	FLUSHING ASPHALT	NYSDOT FACILITY #:	H0239	MIX DESIGN DATE:	2/7/2018
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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%
46.0%	#57 Stone	8-32R	2.746	2.703	44.4%	44.2%	43.9%	43.7%	43.5%
10.0%	#8 Stone	8-32R	2.737	2.682	9.7%	9.6%	9.6%	9.5%	9.5%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	Natural Sand	8-32R	2.691	2.658	0.0%	0.0%	0.0%	0.0%	0.0%
14.0%	Manuf. Sand	8-32RFM	2.691	2.658	13.5%	13.4%	13.4%	13.3%	13.2%
30.0%	RAP 1		2.692	2.649	30.9%	30.7%	30.5%	30.4%	30.2%
0.0%	Not Used		---	---	0.0%	0.0%	0.0%	0.0%	0.0%
	Virgin Asphalt				1.6%	2.1%	2.6%	3.1%	3.6%
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, %			3.5%	4.0%	4.5%	5.0%	5.5%
P <sub>ba</sub>	Percent Absorbed Asphalt Binder, %			0.43%	0.48%	0.37%	0.41%	0.41%
P <sub>be</sub>	Percent Effective Asphalt Binder, %			3.09%	3.54%	4.15%	4.61%	5.11%
DP	Dust Proportion			1.0	1.1	1.3	1.4	1.6
G <sub>mm</sub>	Mix Maximum Specific Gravity			2.563	2.547	2.521	2.504	2.486
G <sub>mb</sub>	Mix Bulk Specific Gravity			2.392	2.399	2.420	2.427	2.438
G <sub>sb</sub>	Aggregate Bulk Gravity			2.678	2.678	2.678	2.678	2.678
G <sub>se</sub>	Aggregate Effective Gravity			2.708	2.712	2.704	2.707	2.707
G <sub>sa</sub>	Aggregate Apparent Specific Gravity			2.721	2.721	2.721	2.721	2.721

Mix Acceptance Properties		Low Limit	High Limit	Trial Batch				
				1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	13.5%		13.8%	14.0%	13.7%	13.9%	14.0%
<i>Note: All five trial batches must meet the minimum VMA requirement.</i>								
VFA	Voids Filled with Asphalt, %	65%	75%	51.7%	58.5%	70.7%	77.8%	86.2%
P <sub>a</sub>	Percent Air Voids, %	3.0%	5.0%	6.7%	5.8%	4.0%	3.1%	1.9%
---	Marshall Stability (Corrected), lb	1500		2420	2700	2880	2650	2300
---	Marshall Flow, 0.01"	8	12	8.7	9.8	10.7	11.3	12.0
---	Marshall Quotient, lb/0.01"	150		279	275	270	234	192

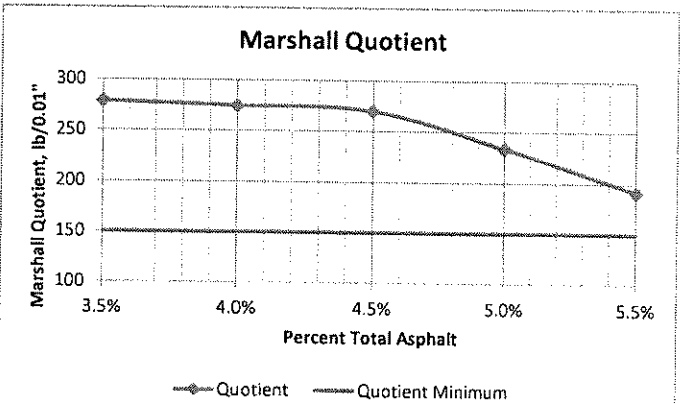
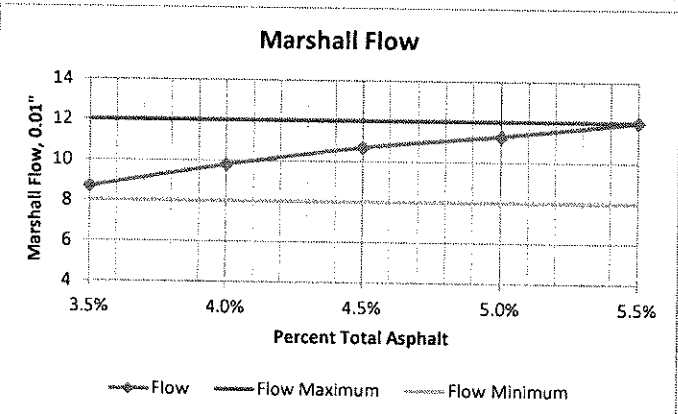
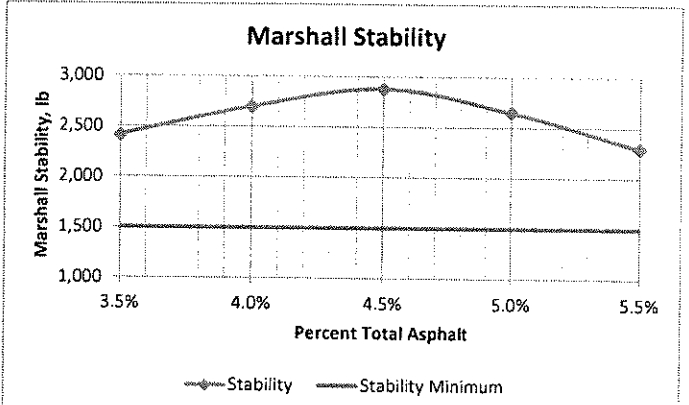
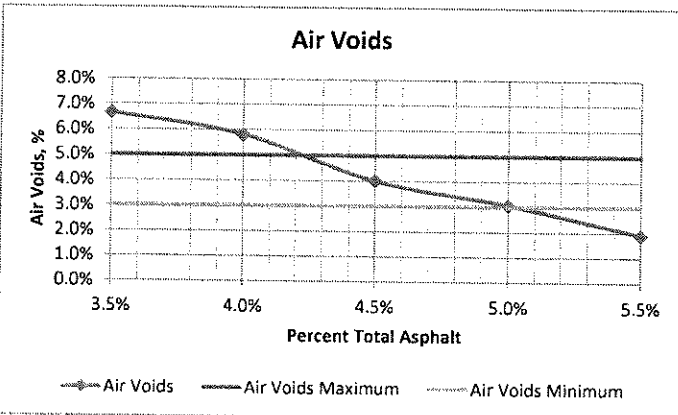
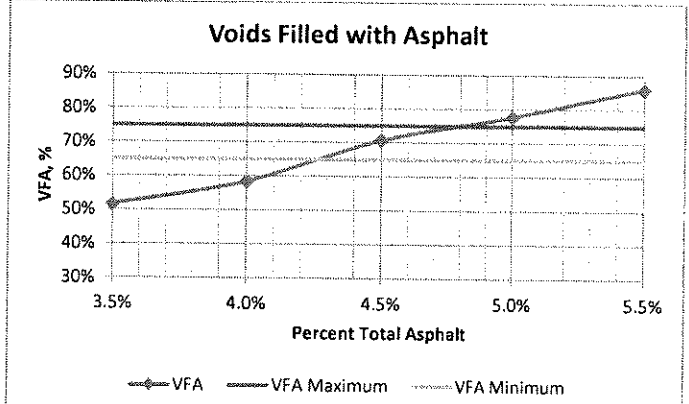
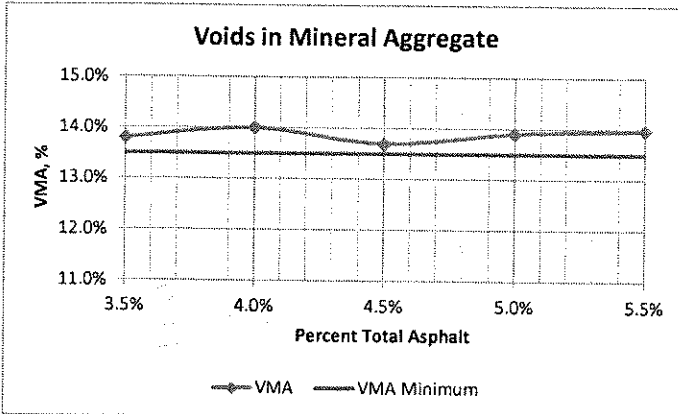
# QA & CONSTRUCTION SAFETY BUREAU

## PROPERTY CURVES & DESIRED ASPHALT CONTENT WORKSHEET - 3 RA BINDER MIX

PLANT NAME: FLUSHING ASPHALT

NYSDOT FACILITY #: H0239

MIX DESIGN DATE: 2/7/2018



Property	High	Low
Voids in Mineral Aggregate (VMA), %	4.0%	4.5%
Voids Filled with Asphalt (VFA), %	4.8%	4.3%
Percent Air Voids, %	4.3%	5.0%
Marshall Stability (Corrected), lb	4.5%	5.5%
Marshall Flow, 0.01"	5.5%	3.5%
Marshall Quotient, lb/0.01"	4.1%	5.5%
Overlap	5.5%	3.5%

Properties at Desired AC%
13.7%
70.7%
4.0%
2880
10.7
250

Midpoint	4.5%
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Desired Total Asphalt Content P <sub>b</sub>	4.5%
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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.