



**Department of  
Design and  
Construction**

**Jamie Torres-Springer**  
Commissioner

**Safety & Site Support Division  
Office of Quality Assurance**

**John M. DeVito, SCTPP**  
Director  
Quality Assurance Unit

**Concrete and Asphalt Generic Mix Design Approval # 2021 – 424**

30-30 Thomson Avenue  
Long Island City, NY 11101

**Date:** 10/5/2021

Tel. 718 / 391-1395  
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**To:** **Matthew D. Harrison,  
Green Asphalt Co.**

**From:** **John M. DeVito, Director  
Quality Assurance**

**Date Submitted:** 9/24/2021

**Plant:** Green Asphalt Co.

**NYSDOT Facility Numbers:** H0385

**Laboratory:** MT Group

**Mix Design Type:** 3RA Binder – 50% RAP

**Generic Mix Design Serial Number:** GreenAsphalt/3RA/Binder/Generic/NYCDDC/114/21

**Generic Mix Design – Mix Design Date:** 9/17/2021

**Generic Mix Design – Expiration Date:** 10/31/2023 (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: Kelvin Law, PE, Engineer In Charge

# QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: Green Asphalt  
 NYSDOT FACILITY #: H0385  
 PLANT ADDRESS: 37-98 Railroad Ave  
Long Island City, NY 11101

MIX DESIGN DATE: 9/17/2021  
 PREPARED BY: Alex Cantos  
 COMPANY: MT Group  
 PLANT QC MGR: Matthew Harrison

Item	Supplier / Quarry	NYSDOT Source	High Friction	Agg. Blend %	Mix %	Lbs / Ton	
					0.0%	0	
#67 Stone	A. Colarusso & Son, Inc	8-17R	Yes	40.0%	39.2%	785	
					0.0%	0	
					0.0%	0	
Natural Sand	North American Aggregates	10-105F2	N/A	10.0%	9.8%	196	
			N/A		0.0%	0	
5/16" RAP	Green Asphalt	N/A	Yes	20.0%	19.6%	392	
	RAP % Asphalt: 4.2%			RAP AC	0.8%	16	
<i>All RAP to be from Municipal Sources - Aggregates from State Quarries</i>					RAP Aggregate	18.8%	376
Fine RAP	Green Asphalt	N/A	Yes	30.0%	29.4%	589	
	RAP % Asphalt: 6.2%			RAP AC	1.8%	36	
<i>All RAP to be from Municipal Sources - Aggregates from State Quarries</i>					RAP Aggregate	27.6%	553
Virgin Asphalt	Grade: PG64-22	SG (G <sub>b</sub> ):	1.031		1.9%	38	
Total Asphalt Content (P <sub>b</sub> ):					4.5%	90	
					100.0%	2,000	

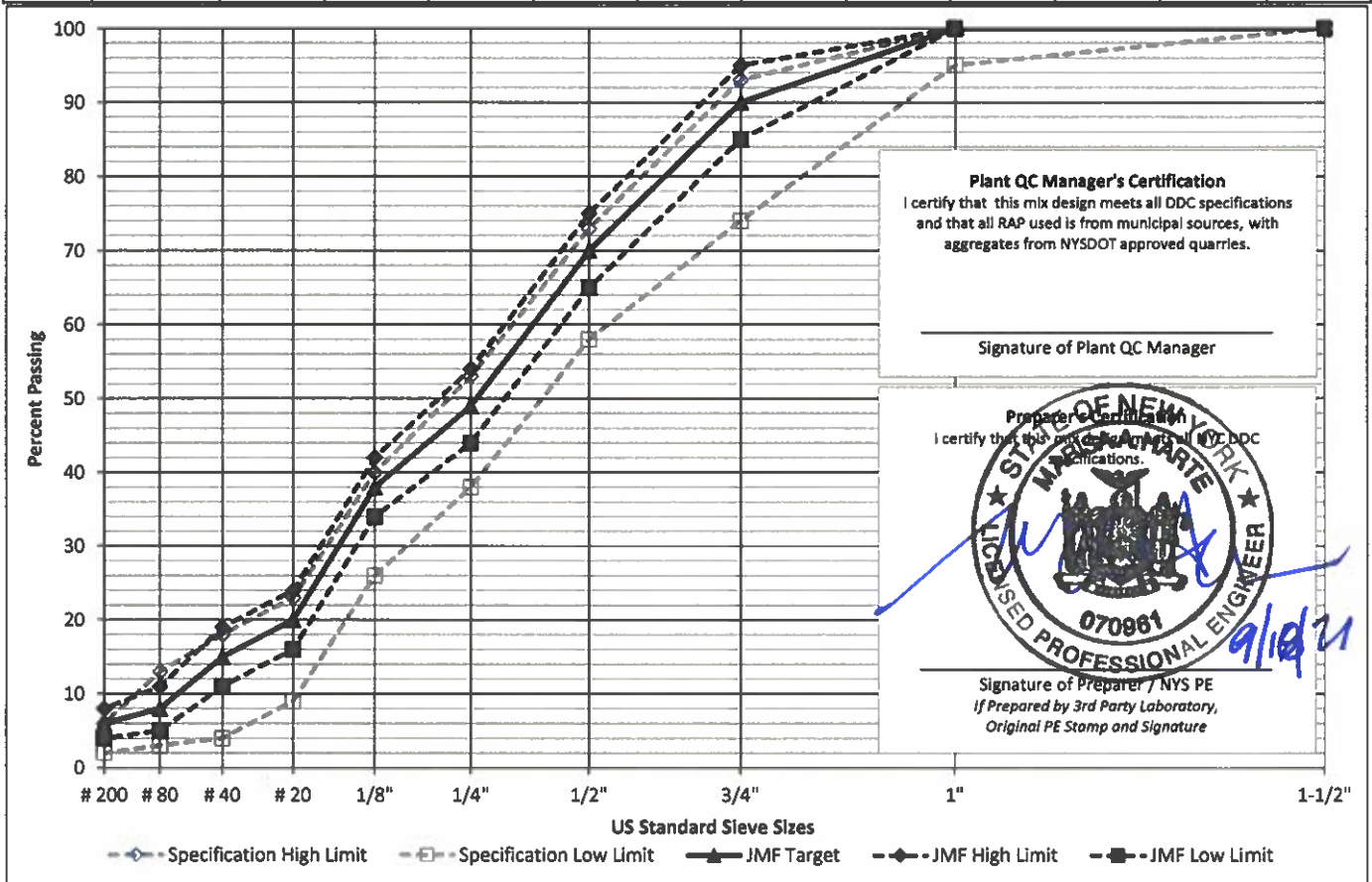
**APPROVED**

Project: Generic  
 NYC DDC QA  
 Date: 10/5/21  
 Reviewed by: S.C.  
 Log No: 2021-424

QA&CS APPROVAL STAMP

**GreenAsphalt/3RA/Binder/Generic/NYCDDC/114/21 EXP: 10/31/2023**

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	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6	4.0-6.0
JMF Target	100	100	90	70	49	38	20	15	8	6	4.5
JMF Range	100	100	85-95	65-75	44-54	34-42	16-24	11-19	5-11	4-8	4.0-5.2



# QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: **Green Asphalt**  
 NYSDOT FACILITY #: **H0385**  
 PLANT ADDRESS: **37-98 Railroad Ave**  
**Long Island City, NY 11101**

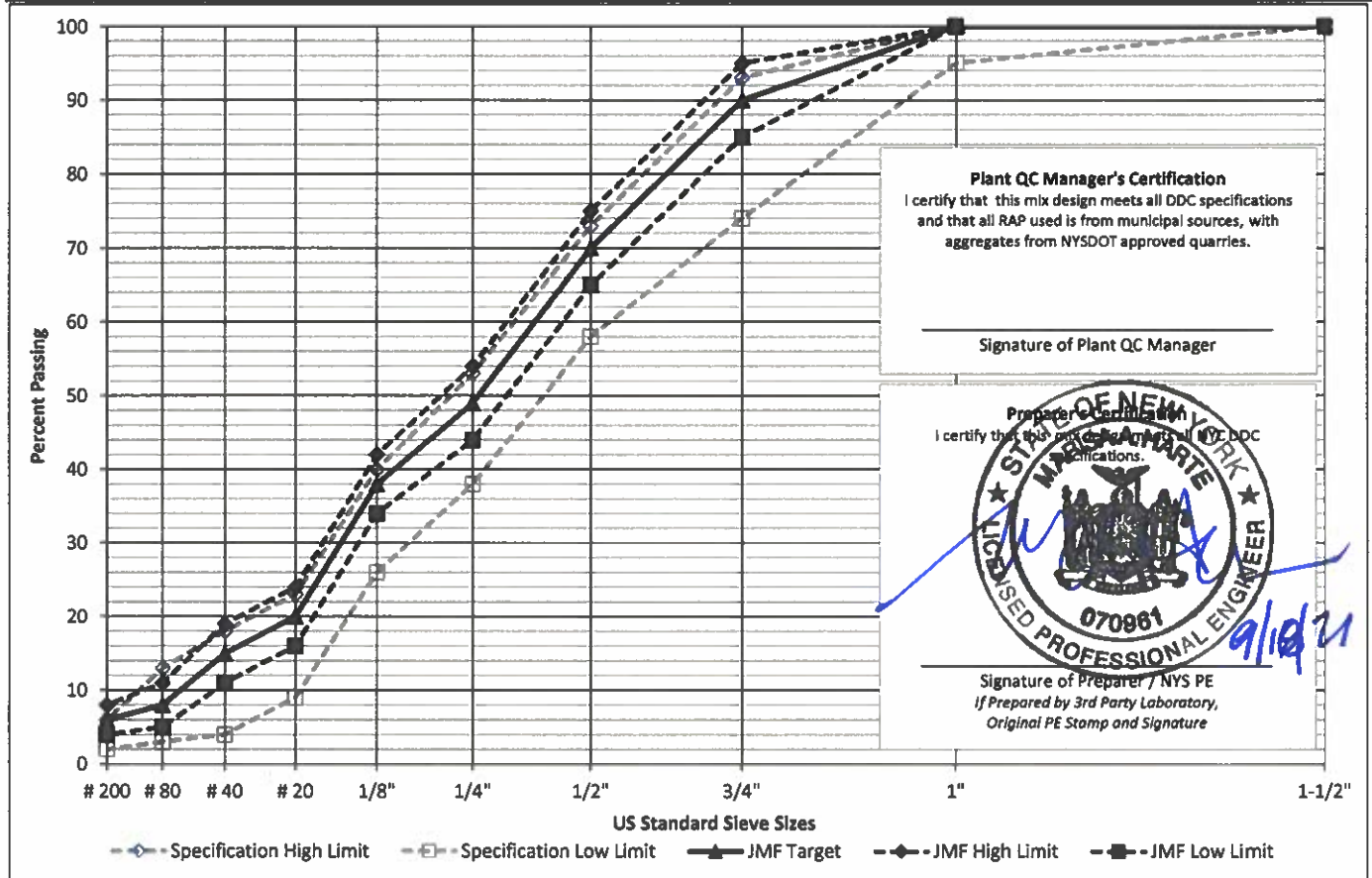
MIX DESIGN DATE: **9/17/2021**  
 PREPARED BY: **Alex Cantos**  
 COMPANY: **MT Group**  
 PLANT QC MGR: **Matthew Harrison**

Item	Supplier / Quarry	NYSDOT Source	High Friction	Agg. Blend %	Mix %	Lbs / Ton	
					0.0%	0	
#67 Stone	A. Colarusso & Son, Inc	8-17R	Yes	40.0%	39.2%	785	
					0.0%	0	
					0.0%	0	
Natural Sand	North American Aggregates	10-105F2	N/A	10.0%	9.8%	196	
			N/A		0.0%	0	
5/16" RAP	Green Asphalt	N/A	Yes	20.0%	19.6%	392	
	RAP % Asphalt: 4.2%			RAP AC	0.8%	16	
<i>All RAP to be from Municipal Sources - Aggregates from State Quarries</i>					RAP Aggregate	18.8%	376
Fine RAP	Green Asphalt	N/A	Yes	30.0%	29.4%	589	
	RAP % Asphalt: 6.2%			RAP AC	1.8%	36	
<i>All RAP to be from Municipal Sources - Aggregates from State Quarries</i>					RAP Aggregate	27.6%	553
Virgin Asphalt	Grade: PG64-22	SG (G <sub>b</sub> ):	1.031		1.9%	38	
Total Asphalt Content (P <sub>b</sub> ):					4.5%	90	
					100.0%	100.0%	2,000

QA&CS APPROVAL STAMP

**GreenAsphalt/3RA/Binder/Generic/NYCDCC/114/21 EXP: 10/31/2023**

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	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6	4.0-6.0
JMF Target	100	100	90	70	49	38	20	15	8	6	4.5
JMF Range	100	100	85-95	65-75	44-54	34-42	16-24	11-19	5-11	4-8	4.0-5.2



## QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: Green Asphalt      NYSDOT FACILITY #: H0385      MIX DESIGN DATE: 9/17/2021

#### Average Bin Gradations

Sieve	Not Used		#67 Stone		Not Used		Not Used		Natural Sand		Not Used		5/16" RAP		Fine RAP	
	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass
1.5"		100.0	0.0	100.0		100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1"		100.0	0.0	100.0		100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
3/4"		100.0	24.2	75.8		100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1/2"		100.0	50.6	25.2		100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1/4"		100.0	17.9	7.3		100.0		100.0	0.0	100.0		100.0	61.3	38.7	5.1	94.9
1/8"		100.0	5.8	1.5		100.0		100.0	4.5	95.5		100.0	17.1	21.6	17.6	77.3
#20		100.0	0.0	1.5		100.0		100.0	35.4	60.1		100.0	13.3	8.3	36.8	40.5
#40		100.0	0.0	1.5		100.0		100.0	26.6	33.5		100.0	0.0	8.3	10.0	30.5
#80		100.0	0.0	1.5		100.0		100.0	27.7	5.8		100.0	0.0	8.3	12.5	18.0
#200		100.0	0.0	1.5		100.0		100.0	3.0	2.8		100.0	0.0	8.3	8.0	10.0
Pan			1.5						2.8				8.3		10.0	
Totals	0.0		100.0		0.0		0.0		100.0		0.0		100.0		100.0	

Stockpiles Sampled By: Alex Cantos      Date Sampled: 6/12/2021

Gradation Technician: Isak Aranov      Date Tested: 8/13/2021

#### 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	#67 Stone	Not Used	Not Used	Natural Sand	Not Used	5/16" RAP	Fine RAP
% Coarse Agg.	---	92.7%	---	---	0.0%	---	61.3%	5.1%
Test Required?	NO	YES	NO	NO	NO	NO	YES	NO
A) Wt. in Air		3222.1					3230.1	
B) Wt. SSD		3238.5					3244.1	
C) Wt. in Water		2046.5					2064.3	
G <sub>sb</sub> (A/(B-C))	---	2.703	---	---	---	---	2.738	---
G <sub>sa</sub> (A/(A-C))	---	2.741	---	---	---	---	2.771	---

#### 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	#67 Stone	Not Used	Not Used	Natural Sand	Not Used	5/16" RAP	Fine RAP
% Fine Agg.	---	7.3%	---	---	100.0%	---	38.7%	94.9%
Test Required?	NO	NO	NO	NO	YES	NO	YES	YES
A) Wt. in Air					499.5		500.2	501.1
B) Wt. Flask + Water					1451.6		1451.6	1451.6
C) Wt. Flask + Water + Sample					1765.9		1770.6	1770.8
S) Wt. SSD					502.2		502.4	503.6
G <sub>sb</sub> (A/(B+S-C))	---	---	---	---	2.658	---	2.727	2.717
G <sub>sa</sub> (A/(B+A-C))	---	---	---	---	2.697	---	2.760	2.755

#### Combined Aggregate Specific Gravity

	Not Used	#67 Stone	Not Used	Not Used	Natural Sand	Not Used	5/16" RAP	Fine RAP
Combined G <sub>sb</sub>	---	2.703	---	---	2.658	---	2.734	2.717
Combined G <sub>sa</sub>	---	2.741	---	---	2.697	---	2.767	2.755

S. G. Technician: Alex Cantos      Date Tested: 8/16/2021

#### 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
#67 Stone	40.0%	40.0	40.0	30.3	10.1	2.9	0.6	0.6	0.6	0.6	0.6
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	10.0%	10.0	10.0	10.0	10.0	10.0	9.6	6.0	3.4	0.6	0.3
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/16" RAP	20.0%	20.0	20.0	20.0	20.0	7.7	4.3	1.7	1.7	1.7	1.7
Fine RAP	30.0%	30.0	30.0	30.0	30.0	28.5	23.2	12.2	9.2	5.4	3.0
Total	100.0%	100.0	100.0	90.3	70.1	49.1	37.7	20.4	14.8	8.2	5.5
Specification Limits		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: Green Asphalt

NYSDOT FACILITY #: H0385

MIX DESIGN DATE: 9/17/2021

BATCH 1		Batch P <sub>b</sub> :	3.5%	Batch Weights, Retained on Sieve - Grams																	
		Batch Grams:	1280.0 <th>Bin</th> <th>Agg. Blend</th> <th>Mix Blend</th> <th>Batch Grams</th> <th>Asph. Grams</th> <th>1.5"</th> <th>1"</th> <th>3/4"</th> <th>1/2"</th> <th>1/4"</th> <th>1/8"</th> <th>#20</th> <th>#40</th> <th>#80</th> <th>#200</th> <th>Pan</th> <th></th>	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
#67 Stone		40.0%	38.6%	494.1					0.0	0.0	119.6	250.0	88.4	28.7	0.0	0.0	0.0	0.0	0.0	7.4	494.1
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
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
Natural Sand		10.0%	9.7%	123.5					0.0	0.0	0.0	0.0	0.0	5.6	43.7	32.9	34.2	3.7	3.5	123.5	
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
5/16" RAP		20.0%	20.1%	257.9	10.8				0.0	0.0	0.0	0.0	158.1	44.1	34.3	0.0	0.0	0.0	10.6	257.9	
Fine RAP		30.0%	30.9%	395.1	24.5				0.0	0.0	0.0	0.0	20.1	69.5	145.4	39.5	49.4	31.6	15.0	395.1	
Virgin Asphalt			0.7%	9.5	9.5															9.5	
<b>Total Mix</b>		<b>100.0%</b>	<b>100.0%</b>	<b>1280.0</b>	<b>44.8</b>				<b>0.0</b>	<b>0.0</b>	<b>119.6</b>	<b>250.0</b>	<b>266.7</b>	<b>147.8</b>	<b>223.4</b>	<b>72.4</b>	<b>83.6</b>	<b>35.3</b>	<b>36.5</b>	<b>1280.0</b>	

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
#67 Stone		40.0%	38.4%	491.5					0.0	0.0	118.9	248.7	88.0	28.5	0.0	0.0	0.0	0.0	7.4	491.5	
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
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
Natural Sand		10.0%	9.6%	122.9					0.0	0.0	0.0	0.0	0.0	5.5	43.5	32.7	34.0	3.7	3.4	122.9	
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	0.0
5/16" RAP		20.0%	20.0%	256.5	10.8				0.0	0.0	0.0	0.0	157.3	43.9	34.1	0.0	0.0	0.0	10.5	256.5	
Fine RAP		30.0%	30.7%	393.0	24.4				0.0	0.0	0.0	0.0	20.0	69.2	144.6	39.3	49.1	31.4	14.9	393.0	
Virgin Asphalt			1.3%	16.1	16.1															16.1	
<b>Total Mix</b>		<b>100.0%</b>	<b>100.0%</b>	<b>1280.0</b>	<b>51.2</b>				<b>0.0</b>	<b>0.0</b>	<b>118.9</b>	<b>248.7</b>	<b>265.3</b>	<b>147.1</b>	<b>222.2</b>	<b>72.0</b>	<b>83.2</b>	<b>35.1</b>	<b>36.3</b>	<b>1280.0</b>	

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
#67 Stone		40.0%	38.2%	489.0					0.0	0.0	118.3	247.4	87.5	28.4	0.0	0.0	0.0	0.0	7.3	489.0
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
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
Natural Sand		10.0%	9.6%	122.2					0.0	0.0	0.0	0.0	0.0	5.5	43.3	32.5	33.9	3.7	3.4	122.2
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
5/16" RAP		20.0%	19.9%	255.2	10.7				0.0	0.0	0.0	0.0	156.4	43.6	33.9	0.0	0.0	0.0	10.5	255.2
Fine RAP		30.0%	30.5%	391.0	24.2				0.0	0.0	0.0	0.0	19.9	68.8	143.9	39.1	48.9	31.3	14.9	391.0
Virgin Asphalt			1.8%	22.6	22.6															22.6
<b>Total Mix</b>		<b>100.0%</b>	<b>100.0%</b>	<b>1280.0</b>	<b>57.6</b>				<b>0.0</b>	<b>0.0</b>	<b>118.3</b>	<b>247.4</b>	<b>263.9</b>	<b>146.3</b>	<b>221.1</b>	<b>71.6</b>	<b>82.7</b>	<b>34.9</b>	<b>36.1</b>	<b>1280.0</b>

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
#67 Stone		40.0%	38.0%	486.4					0.0	0.0	117.7	246.1	87.1	28.2	0.0	0.0	0.0	0.0	7.3	486.4
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
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
Natural Sand		10.0%	9.5%	121.6					0.0	0.0	0.0	0.0	0.0	5.5	43.0	32.3	33.7	3.6	3.4	121.6
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
5/16" RAP		20.0%	19.8%	253.9	10.7				0.0	0.0	0.0	0.0	155.6	43.4	33.8	0.0	0.0	0.0	10.4	253.9
Fine RAP		30.0%	30.4%	388.9	24.1				0.0	0.0	0.0	0.0	19.8	68.4	143.1	38.9	48.6	31.1	14.8	388.9
Virgin Asphalt			2.3%	29.2	29.2															29.2
<b>Total Mix</b>		<b>100.0%</b>	<b>100.0%</b>	<b>1280.0</b>	<b>64.0</b>				<b>0.0</b>	<b>0.0</b>	<b>117.7</b>	<b>246.1</b>	<b>262.5</b>	<b>145.5</b>	<b>219.9</b>	<b>71.2</b>	<b>82.3</b>	<b>34.8</b>	<b>35.9</b>	<b>1280.0</b>

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
#67 Stone		40.0%	37.8%	483.8					0.0	0.0	117.1	244.8	86.6	28.1	0.0	0.0	0.0	0.0	7.3	483.8
Not Used		0.0%	0.0%	0.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
Natural Sand		10.0%	9.5%	121.0					0.0	0.0	0.0	0.0	0.0	5.4	42.8	32.2	33.5	3.6	3.4	121.0
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
5/16" RAP		20.0%	19.7%	252.5	10.6				0.0	0.0	0.0	0.0	154.8	43.2	33.6	0.0	0.0	0.0	10.4	252.5
Fine RAP		30.0%	30.2%	386.9	24.0				0.0	0.0	0.0	0.0	19.7	68.1	142.4	38.7	48.4	30.9	14.7	386.9
Virgin Asphalt			2.8%	35.8	35.8															35.8
<b>Total Mix</b>		<b>100.0%</b>	<b>100.0%</b>	<b>1280.0</b>	<b>70.4</b>				<b>0.0</b>	<b>0.0</b>	<b>117.1</b>	<b>244.8</b>	<b>261.1</b>	<b>144.8</b>	<b>218.8</b>	<b>70.9</b>	<b>81.9</b>	<b>34.6</b>	<b>35.7</b>	<b>1280.0</b>

5.50%

# QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: Green Asphalt	NYSDOT FACILITY #: H0385	MIX DESIGN DATE: 9/17/2021
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### 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)	2074.5	2056.7	2011.7	2056.1	2044.1	2056.3	2054.5	2089.6	2063.4	2045.8
B) Pycnometer in Water (Grams)	1572.7	1537.8	1572.7	1537.8	1572.7	1537.8	1572.7	1537.8	1572.7	1537.8
C) Sample & Pycnometer in Water (Grams)	2842.9	2798.6	2798.6	2788.9	2812.7	2783.4	2812.7	2798.5	2810.4	2768.7
$G_{mm} (A/(A+B-C))$	2.579	2.584	2.560	2.554	2.542	2.536	2.522	2.521	2.499	2.510
Average $G_{mm}$	2.582		2.557		2.539		2.522		2.505	

Density Technician: Alex Cantos	Date Tested: 9/16/2021
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### 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	1259.7	1262.1	737.7	524.4	2.402	2.582	6.96%		2760	0.96	2650	9.1	291
Specimen B	1263.5	1265.6	740.6	525.0	2.407	2.582	6.79%		2860	0.96	2750	9.3	296
Specimen C	1261.2	1263.6	737.2	526.4	2.396	2.582	7.21%		2890	0.96	2770	9.7	286
Average					2.402	2.582	6.97%	149.9			2720	9.4	291

TRIAL BATCH 2 $P_b = 4.0\%$													
Specimen A	1260.1	1262.2	740.4	521.8	2.415	2.557	5.56%		2710	1	2710	9.8	277
Specimen B	1259.8	1261.8	740.1	521.7	2.415	2.557	5.56%		2960	1	2960	10.4	285
Specimen C	1252.3	1254.2	737.3	516.9	2.423	2.557	5.25%		2940	1	2940	10.0	294
Average					2.417	2.557	5.48%	150.8			2870	10.1	285

TRIAL BATCH 3 $P_b = 4.5\%$													
Specimen A	1258.6	1260.0	742.7	517.3	2.433	2.539	4.17%		2940	1	2940	11.5	256
Specimen B	1259.1	1260.4	743.4	517.0	2.435	2.539	4.08%		3140	1	3140	11.1	283
Specimen C	1257.8	1259.2	741.4	517.8	2.429	2.539	4.33%		3180	1	3180	10.8	294
Average					2.433	2.539	4.17%	151.8			3090	11.1	278

TRIAL BATCH 4 $P_b = 5.0\%$													
Specimen A	1255.4	1256.5	742.9	513.6	2.444	2.522	3.08%		3350	1	3350	12.1	277
Specimen B	1259.6	1260.7	745.9	514.8	2.447	2.522	2.98%		3240	1	3240	12.7	255
Specimen C	1258.6	1259.6	745.3	514.3	2.447	2.522	2.97%		3320	1	3320	13.4	248
Average					2.446	2.522	3.01%	152.6			3300	12.7	260

TRIAL BATCH 5 $P_b = 5.5\%$													
Specimen A	1257.7	1258.5	746.0	512.5	2.454	2.505	2.03%		3340	1	3340	13.8	242
Specimen B	1259.6	1260.5	747.1	513.4	2.453	2.505	2.06%		3160	1	3160	13.8	229
Specimen C	1259.4	1260.3	747.1	513.2	2.454	2.505	2.04%		3270	1	3270	14.1	232
Average					2.454	2.505	2.04%	153.1			3260	13.9	234

Marshall Technician: Alex Cantos	Date Tested: 9/16/2021
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# QA & CONSTRUCTION SAFETY BUREAU

## MIX VOLUMETRIC PROPERTIES WORKSHEET - 3 RA BINDER MIX

PLANT: Green Asphalt	NYS DOT FACILITY #: H0385	MIX DESIGN DATE: 9/17/2021
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Agg. Blend %	Constituent Material	NYS DOT 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%
40.0%	#67 Stone	8-17R	2.741	2.703	38.6%	38.4%	38.2%	38.0%	37.8%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
10.0%	Natural Sand	10-105F2	2.697	2.658	9.7%	9.6%	9.6%	9.5%	9.5%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
20.0%	5/16" RAP		2.767	2.734	20.1%	20.0%	19.9%	19.8%	19.7%
30.0%	Fine RAP		2.755	2.717	30.9%	30.7%	30.5%	30.4%	30.2%
	Virgin Asphalt				0.7%	1.3%	1.8%	2.3%	2.8%
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, %			0.31%	0.22%	0.25%	0.29%	0.32%
P <sub>be</sub>	Percent Effective Asphalt Binder, %			3.20%	3.79%	4.26%	4.72%	5.20%
DP	Dust Proportion (0.6 to 1.2 desired)			0.6	0.7	0.8	0.9	0.9
G <sub>mm</sub>	Mix Maximum Specific Gravity			2.582	2.557	2.539	2.522	2.505
G <sub>mb</sub>	Mix Bulk Specific Gravity			2.402	2.417	2.433	2.446	2.454
G <sub>sb</sub>	Aggregate Bulk Gravity			2.709	2.709	2.709	2.709	2.709
G <sub>se</sub>	Aggregate Effective Gravity			2.731	2.725	2.727	2.730	2.732
G <sub>sa</sub>	Aggregate Apparent Specific Gravity			2.746	2.746	2.746	2.746	2.746

Mix Acceptance Properties		Low Limit	High Limit	Trial Batch				
				1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	13.5%		✓ 14.4%	✓ 14.3%	✓ 14.2%	✓ 14.2%	✓ 14.4%
	<i>Note: All five trial batches must meet the minimum VMA requirement.</i>							
VFA	Voids Filled with Asphalt, %	65%	75%	✗ 51.7%	✗ 61.8%	✓ 70.7%	✗ 78.8%	✗ 85.8%
P <sub>a</sub>	Percent Air Voids, %	3.0%	5.0%	✗ 7.0%	✗ 5.5%	✓ 4.2%	✓ 3.0%	✗ 2.0%
---	Marshall Stability (Corrected), lb	1500		✓ 2720	✓ 2870	✓ 3090	✓ 3300	✓ 3260
---	Marshall Flow, 0.01"	8	12	✓ 9.4	✓ 10.1	✓ 11.1	✗ 12.7	✗ 13.9
---	Marshall Quotient, lb/0.01"	150		✓ 291	✓ 285	✓ 278	✓ 260	✓ 234



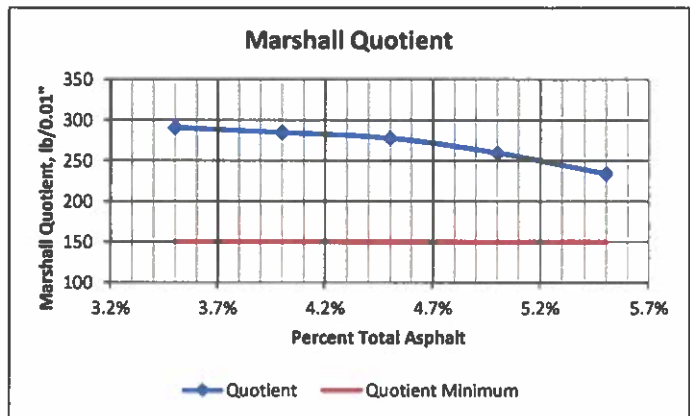
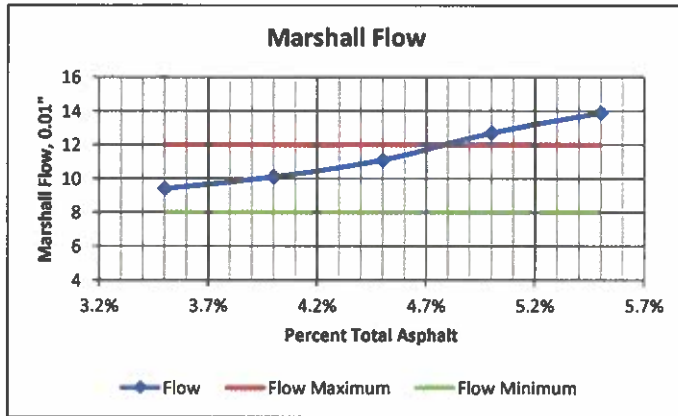
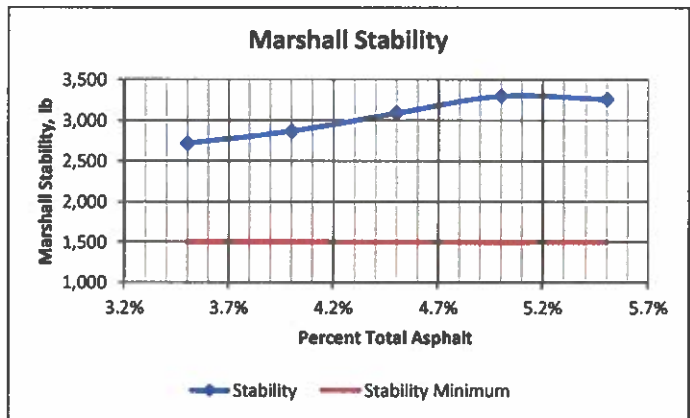
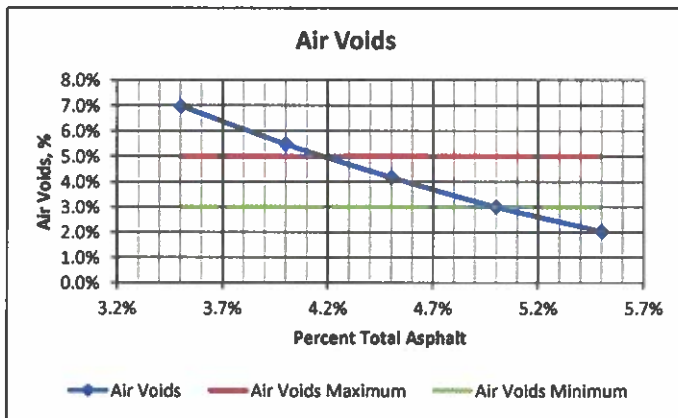
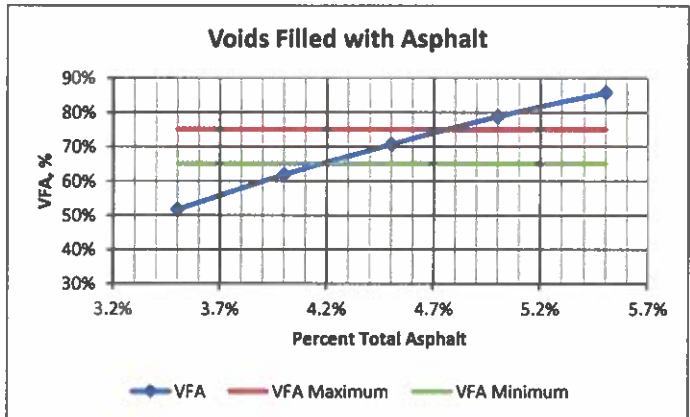
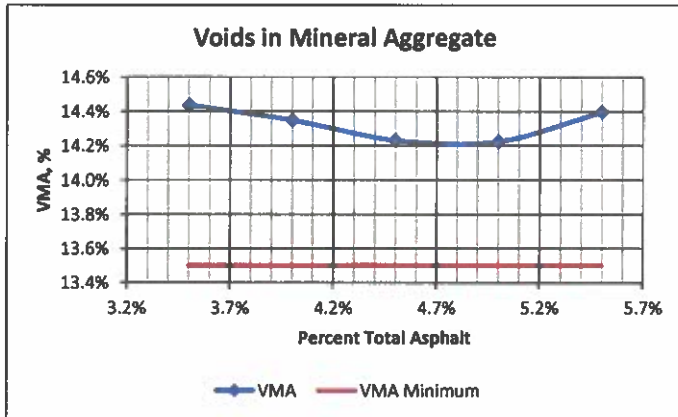
# QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: Green Asphalt

NYSDOT FACILITY #: H0385

MIX DESIGN DATE: 9/17/2021



Property	High	Low
Voids in Mineral Aggregate (VMA), %	3.5%	5.5%
Voids Filled with Asphalt (VFA), %	4.2%	4.8%
Percent Air Voids, %	4.2%	4.9%
Marshall Stability (Corrected), lb	3.5%	5.5%
Marshall Flow, 0.01"	3.5%	4.8%
Marshall Quotient, lb/0.01"	3.5%	5.5%
Overlap	4.2%	4.8%

Properties at Desired AC%
14.2%
70.7%
4.2%
3090
11.1
269.6

Midpoint	4.5%
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Desired Total Asphalt Content P <sub>0</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.