Department of Design and Construction

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Commissioner

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Safety & Site Support

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Safety & Site Support Division
Office of Quality Assurance

Concrete and Asphalt Generic Mix Design Approval # 2023 - 129

Date: **12/15/2023**

To: **Matthew D. Harrison,**
Green Asphalt

From: **Juan Martinez, PE, Director**
Office of Quality Assurance

Date Submitted: 12/13/2023

Plant: Green Asphalt

NYSDOT Facility Numbers: H0385

Laboratory: MT Group - Intertek

Mix Design Type: 6FRA Top – 30% RAP

Generic Mix Design Serial Number: GreenAsphalt/6FRA/Top/Generic/NYCDDC/12/23/129

Generic Mix Design Date: 11/13/2023

Generic Mix Design Expiration Date: 12/31/2025

Comments:
1) This mix design is approved only for the NYSDOT Facility Numbers listed above.
2) Approval is valid only if facilities listed above remain on the DDC OQA Approved list of Concrete and/or Asphalt Plants.
3) Approval is limited to the material sources and aggregate sizes shown on the mix design.
4) 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: Nader Shehata, PE, Deputy Director

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 6F RA TOP MIX

PLANT NAME:	Green Asphalt	MIX DESIGN DATE	11/13/20[illegible]
NYSDOT FACILITY #:	H0385	PREPARED BY:	Alex Canto[illegible]
PLANT ADDRESS:	37-98 Railroad Ave	COMPANY	MT Group
	Long Island City, NY 11101	PLANT QC MGR:	Matthew Harrison

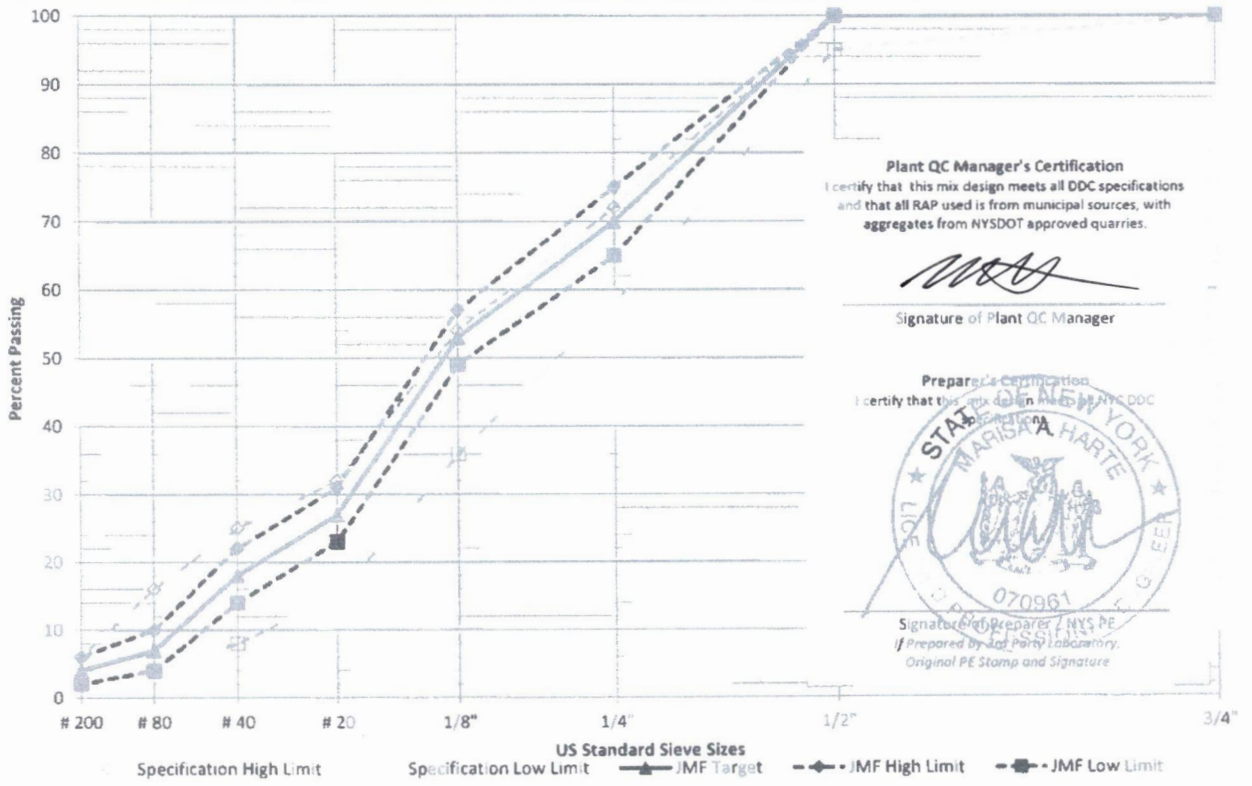
Item	Supplier / Quarry		NYSDOT Source	Friction Agg	Agg Blend %	Mix %	Lbs / Ton
						0.0%	0
						0.0%	0
#8 Stone	R. J. Valente		1 48P	Yes	40.0%	38.5%	770
						0.0%	0
Natural Sand	North American Aggregates		10-105F2	N/A	30.0%	28.9%	578
				N/A		0.0%	0
5/16" RAP	Green Asphalt		N/A	Yes	10.0%	9.6%	193
	RAP % Asphalt:	4.0%		RAP AC		0.4%	8
				RAP Aggregate		9.2%	185
Fine RAP	Green Asphalt		N/A	Yes	20.0%	19.3%	385
	RAP % Asphalt:	6.1%		RAP AC		1.2%	24
				RAP Aggregate		18.1%	361
Virgin Asphalt	Grade:	PG64 22	SG (G_b):	1.031		3.7%	74
Total Asphalt Content (P_b)						5.3%	106
					100.0%	100.0%	2,000

Project No: Generic
"APPROVED"
NYC DDC - Office of Quality Assurance
Date: 12/12/23 Reviewed By: S.C.
LOG No: 2023-129

GreenAsphalt/6FRA/Top/Generic/NYCDDC/12/23/129 Expiration: 12/31/2025

QA&CS SERIAL NUMBER & EXPIRATION DATE

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	95-100	58-72	36-54	15-32	8 25	4 16	2-6	5 0-6 2
JMF Target	100	100	100	100	70	53	27	18	7	4	5.3
JMF Range	100	100	100	100	65-75	49-57	23-31	14-22	4-10	2-6	5.0-6.0



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.

Signature of Plant QC Manager

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

STATE OF NEW YORK
MARISA HARTE
070961
LICENSED PROFESSIONAL ENGINEER

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

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT COMBINED GRADATION WORKSHEET - 6F RA TOP MIX

PLANT NAME	Green Asphalt	NYSDOT FAC LITY #	H0385	M X DESIGN DATE	11/13/2023

Average Bin Gradations

	Not Used		Not Used		#8 Stone		Not Used		Natural Sand		Not Used		5/16" RAP		Fine RAP	
Sieve	% Ret	% Pass	% Ret	% Pass	% Ret.	% Pass	% Ret	% Pass	% Ret.	% Pass	% Ret	% Pass	% Ret	% Pass	% Ret	% Pass
1.5"		100.0		100.0	0.0	100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1"		100.0		100.0	0.0	100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
3/4"		100.0		100.0	0.0	100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1/2"		100.0		100.0	0.0	100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1/4"		100.0		100.0	57.1	42.9		100.0	0.0	100.0		100.0	13.4	35.6	5.6	94.4
1/8"		100.0		100.0	26.2	16.7		100.0	4.9	95.1		100.0	18.6	18.0	15.7	78.7
#20		100.0		100.0	15.9	0.8		100.0	35.1	60.0		100.0	9.7	8.3	37.4	41.3
#40		100.0		100.0	0.0	0.8		100.0	25.5	34.5		100.0	0.0	8.3	8.8	32.5
#80		100.0		100.0	0.0	0.8		100.0	29.4	5.1		100.0	0.0	8.3	13.4	19.1
#200		100.0		100.0	0.0	0.8		100.0	2.3	2.8		100.0	0.0	8.3	9.9	9.2
Pan					0.8				2.8				8.3		9.2	
Totals	0.0		0.0		100.0		0.0		100.3		0.0		100.0		100.0	

Stockpiles Sampled By:	Alex Cantos	Date Sampled	11/30/2023
Gradation Technician	Izak Aranov	Date Tested	12/6/2023

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	Not Used	#8 Stone	Not Used	Natural Sand	Not Used	5/16" RAP	Fine RAP
% Coarse Agg.	---	---	57.1%	---	0.0%	--	63.4%	5.6%
Test Required?	NO	NO	YES	NO	NO	NO	YES	NO
A) Wt. in Air			3223.7				3236.4	
B) Wt. SSD			3239.5				3247.6	
C) Wt. in Water			2041.0				2063.7	
G_{sb} (A/(B-C)	---	---	2.690	---	---	--	2.734	---
G_{sa} (A/(A-C)	---	---	2.726	--	--	--	2.760	

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	Not Used	#8 Stone	Not Used	Natural Sand	Not Used	5/16" RAP	Fine RAP
% Fine Agg.	---	---	42.9%	---	100.0%		36.6%	94.4%
Test Required?	NO	NO	YES	NO	YES	NO	YES	YES
A) Wt. in Air			499.1		498.4		499.6	502.5
B) Wt. Flask + Water			1451.6		1451.6		1451.6	1451.6
C) Wt. Flask + Water + Sample			1767.1		1764.5		1769.4	1770.7
S) Wt. SSD			501.7		501.3		501.5	504.1
G_{sb} (A/(B+S-C)	---	---	2.680	---	2.645		2.714	2.716
G_{sa} (A/(B+A-C)	--	---	2.718	---	2.687	--	2.748	2.740

Combined Aggregate Specific Gravity

	Not Used	Not Used	#8 Stone	Not Used	Natural Sand	Not Used	5/16" RAP	Fine RAP
Combined G_{sb}	---	---	2.686	---	2.645	-	2.726	2.716
Combined G_{sa}	--	---	2.723	---	2.687	--	2.755	2.740

S. G. Technician:	Alex Cantos	Date Tested.	11/30/2023

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
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
#8 Stone	40.0%	40.0	40.0	40.0	40.0	17.2	6.7	0.3	0.3	0.3	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
Natural Sand	30.0%	30.0	30.0	30.0	30.0	30.0	28.5	18.0	10.4	1.5	0.8
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5/16" RAP	10.0%	10.0	10.0	10.0	10.0	3.7	1.8	0.8	0.8	0.8	0.8
Fine RAP	20.0%	20.0	20.0	20.0	20.0	18.9	15.7	8.3	6.5	3.8	1.8
Total	100.0%	100.0	100.0	100.0	100.0	69.7	52.8	27.4	18.0	6.5	3.8
Specification Limits		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	Green Asphalt	NYSDOT FACILITY #	H0385	MIX DESIGN DATE	11/13/2023

BATCH 1

Batch P_b 4

Batch Grams: 125

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
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
#8 Stone	40.0%	38.2%	477.5		0.0	0.0	0.0	0.0	272.7	125.1	75.9	0.0	0.0	0.0	3.8	477.5
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
Natural Sand	30.0%	28.7%	358.1		0.0	0.0	0.0	0.0	0.0	17.5	125.7	91.3	105.3	8.2	10.0	358.1
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
5/16" RAP	10.0%	9.9%	124.3	5.0	0.0	0.0	0.0	0.0	78.8	23.1	12.1	0.0	0.0	0.0	5.3	124.3
Fine RAP	20.0%	20.3%	254.3	15.5	0.0	0.0	0.0	0.0	14.2	39.9	95.1	22.4	34.1	25.2	7.9	254.3
Virgin Asphalt		2.9%	35.8	35.8												35.8
Total Mix	100.0%	100.0%	1250.0	56.3	0.0	0.0	0.0	0.0	365.7	205.7	308.8	113.7	139.4	33.4	27.1	1250.0

4.50%

BATCH 2

Batch P_b 5.

Batch Grams: 125

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
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
#8 Stone	40.0%	38.0%	475.0		0.0	0.0	0.0	0.0	271.2	124.5	75.5	0.0	0.0	0.0	3.8	475.0
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	30.0%	28.5%	356.3		0.0	0.0	0.0	0.0	0.0	17.5	125.0	90.8	104.7	8.2	10.0	356.3
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
5/16" RAP	10.0%	9.9%	123.7	4.9	0.0	0.0	0.0	0.0	78.4	23.0	12.0	0.0	0.0	0.0	5.3	123.7
Fine RAP	20.0%	20.2%	252.9	15.4	0.0	0.0	0.0	0.0	14.2	39.7	94.6	22.3	33.9	25.0	7.8	252.9
Virgin Asphalt		3.4%	42.1	42.1												42.1
Total Mix	100.0%	100.0%	1250.0	62.5	0.0	0.0	0.0	0.0	363.8	204.6	307.2	113.1	138.6	33.2	26.9	1250.0

5.00%

BATCH 3

Batch P_b 5.

Batch Grams: 125

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
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
#8 Stone	40.0%	37.8%	472.5		0.0	0.0	0.0	0.0	269.8	123.8	75.1	0.0	0.0	0.0	3.8	472.5
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
Natural Sand	30.0%	28.4%	354.4		0.0	0.0	0.0	0.0	0.0	17.4	124.4	90.4	104.2	8.2	9.9	354.4
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
5/16" RAP	10.0%	9.8%	123.0	4.9	0.0	0.0	0.0	0.0	78.0	22.9	11.9	0.0	0.0	0.0	5.3	123.0
Fine RAP	20.0%	20.1%	251.6	15.3	0.0	0.0	0.0	0.0	14.1	39.5	94.1	22.1	33.7	24.9	7.8	251.6
Virgin Asphalt		3.9%	48.5	48.5												48.5
Tota Mix	100.0%	100.0%	1250.0	68.8	0.0	0.0	0.0	0.0	361.9	203.5	305.5	112.5	137.9	33.1	26.8	1250.0

5.50%

BATCH 4

Batch P_b 5.0%

Batch Grams 1250.0

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
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
#8 Stone	40.0%	37.6%	470.0		0.0	0.0	0.0	0.0	268.4	123.1	74.7	0.0	0.0	0.0	3.8	470.0
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	30.0%	28.2%	352.5		0.0	0.0	0.0	0.0	0.0	17.3	123.7	89.9	103.6	8.1	9.9	352.5
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
5/16" RAP	10.0%	9.8%	122.4	4.9	0.0	0.0	0.0	0.0	77.6	22.8	11.9	0.0	0.0	0.0	5.3	122.4
Fine RAP	20.0%	20.0%	250.3	15.3	0.0	0.0	0.0	0.0	14.0	39.3	93.6	22.0	33.5	24.8	7.8	250.3
Virgin Asphalt		4.4%	54.8	54.8												54.8
Total Mix	100.0%	100.0%	1250.0	75.0	0.0	0.0	0.0	0.0	360.0	202.5	303.9	111.9	137.2	32.9	26.7	1250.0

6.00%

BATCH 5

Batch P_b 6.0%

Batch Grams 1250.0

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
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
#8 Stone	40.0%	37.4%	467.5		0.0	0.0	0.0	0.0	266.9	122.5	74.3	0.0	0.0	0.0	3.7	467.5
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
Natural Sand	30.0%	28.1%	350.6		0.0	0.0	0.0	0.0	0.0	17.2	123.1	89.4	103.1	8.1	9.8	350.6
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	10.0%	9.7%	121.7	4.9	0.0	0.0	0.0	0.0	77.2	22.6	11.8	0.0	0.0	0.0	5.2	121.7
Fine RAP	20.0%	19.9%	248.9	15.2	0.0	0.0	0.0	0.0	13.9	39.1	93.1	21.9	33.4	24.6	7.7	248.9
Virgin Asphalt		4.9%	61.2	61.2												61.2
Total Mix	100.0%	100.0%	1250.0	81.3	0.0	0.0	0.0	0.0	358.1	201.4	302.3	111.3	136.4	32.7	26.5	1250.0

6.50%

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME:	Green Asphalt	NYSDOT FACILITY #:	H0385	MIX DESIGN DATE:	11/13/2023

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	2023.7	2028.4	2006.5	2018.8	2019.2	2014.7	2007.7	2012.4	2018.9
B) Pycnometer in Water (Grams)	1318.8	1326.5	1318.8	1326.5	1318.8	1326.5	1318.8	1326.5	1318.8	1326.5
C) Sample & Pycnometer in Water (Grams)	2531.2	2542.3	2533.2	2524.9	2521.7	2530.2	2515.9	2518.9	2508.0	2519.8
G_{mm} $(A/(A+B-C))$	2.516	2.505	2.492	2.483	2.474	2.476	2.464	2.463	2.445	2.448
Average G_{mm}	2.510		2.487		2.475		2.463		2.446	

Density Technician:	Alex Cantos	Date Tested:	11/13/2023

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	1240.1	1242.2	713.2	529.0	2.344	2.510	6.60%		2850	0.96	2740	8.5	322
Specimen B	1245.6	1247.9	716.3	531.6	2.343	2.510	6.65%		2860	0.96	2750	8.8	313
Specimen C	1243.4	1243.4	712.5	530.9	2.342	2.510	6.69%		2790	0.96	2680	8.8	305
Average					2.343	2.510	6.65%	146.2			2720	8.7	313
TRIAL BATCH 2				P_b = 5.0%									
Specimen A	1243.3	1244.0	717.0	527.0	2.359	2.487	5.14%		2960	0.96	2840	9.8	290
Specimen B	1241.5	1242.6	715.9	526.7	2.357	2.487	5.22%		3040	0.96	2920	9.5	307
Specimen C	1246.7	1247.8	719.4	528.4	2.359	2.487	5.13%		3020	0.96	2900	9.3	312
Average					2.359	2.487	5.15%	147.2			2890	9.5	303
TRIAL BATCH 3				P_b = 5.5%									
Specimen A	1239.4	1240.3	718.1	522.2	2.373	2.475	4.10%		3110	0.96	2990	10.5	285
Specimen B	1238.7	1239.6	717.4	522.2	2.372	2.475	4.16%		3210	0.96	3080	11.0	280
Specimen C	1238.4	1239.4	717.5	521.9	2.373	2.475	4.13%		3010	1	3010	10.6	284
Average					2.373	2.475	4.12%	148.1			3030	10.7	283
TRIAL BATCH 4				P_b = 6.0%									
Specimen A	1237.8	1238.6	719.9	518.7	2.386	2.463	3.11%		3260	1	3260	11.9	274
Specimen B	1238.1	1238.8	719.6	519.2	2.385	2.463	3.18%		3380	1	3380	11.4	296
Specimen C	1236.4	1237.1	719.1	518.0	2.387	2.463	3.09%		3240	1	3240	11.1	292
Average					2.386	2.463	3.13%	148.9			3290	11.5	287
TRIAL BATCH 5				P_b = 6.5%									
Specimen A	1236.4	1237.2	720.4	516.8	2.392	2.446	2.19%		3050	1	3050	11.6	263
Specimen B	1238.1	1239.0	722.4	516.6	2.397	2.446	2.02%		3160	1	3160	11.4	277
Specimen C	1237.9	1238.9	722.8	516.1	2.399	2.446	1.94%		3170	1	3170	11.8	269
Average					2.396	2.446	2.04%	149.5			3130	11.6	270

Marshall Technician	Alex Cantos	Date Tested:	11/13/2023

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

MIX VOLUMETRIC PROPERTIES WORKSHEET - 6F RA TOP MIX

PLANT:	Green Asphalt	NYSDOT FACILITY #:	H0385	MIX DESIGN DATE:	11/13/2023

Agg. Blend %	37-98 Railroad Ave	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%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
40.0%	#8 Stone	1-48R	2.723	2.686	38.2%	38.0%	37.8%	37.6%	37.4%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
30.0%	Natural Sand	10-105F2	2.687	2.645	28.7%	28.5%	28.4%	28.2%	28.1%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
10.0%	5/16" RAP		2.755	2.726	9.9%	9.9%	9.8%	9.8%	9.7%
20.0%	Fine RAP		2.740	2.716	20.3%	20.2%	20.1%	20.0%	19.9%
	Virgin Asphalt				2.9%	3.4%	3.9%	4.4%	4.9%
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, %			0.11%	0.04%	0.16%	0.27%	0.28%
P_{be}	Percent Effective Asphalt Binder, %			4.39%	4.96%	5.35%	5.75%	6.23%
DP	Dust Proportion (0.6 - 1.2 desired)			1.2	1.3	1.4	1.5	1.6
G_{mm}	Mix Maximum Specific Gravity			2.510	2.487	2.475	2.463	2.446
G_{mb}	Mix Bulk Specific Gravity			2.343	2.359	2.373	2.386	2.396
G_{sb}	Aggregate Bulk Gravity			2.684	2.684	2.684	2.684	2.684
G_{se}	Aggregate Effective Gravity			2.692	2.687	2.695	2.703	2.704
G_{sa}	Aggregate Apparent Specific Gravity			2.718	2.718	2.718	2.718	2.718

Mix Acceptance Properties		Low Limit	High Limit	Trial Batch				
				1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	15.5%		✓ 16.6%	✓ 16.5%	✓ 16.4%	✓ 16.4%	✓ 16.5%
	Note: All five trial batches must meet the minimum VMA requirement.							
VFA	Voids Filled with Asphalt, %	65%	75%	✗ 60.0%	✓ 68.8%	✓ 75.0%	✗ 81.0%	✗ 87.7%
P_a	Percent Air Voids, %	3.0%	5.0%	✗ 6.7%	✗ 5.2%	✓ 4.1%	✓ 3.1%	✗ 2.0%
---	Marshall Stability (Corrected), lb	1500		✓ 2720	✓ 2890	✓ 3030	✓ 3290	✓ 3130
---	Marshall Flow, 0.01"	8	12	✓ 8.7	✓ 9.5	✓ 10.7	✓ 11.5	✓ 11.6
---	Marshall Quotient, lb/0.01"	150		✓ 313	✓ 303	✓ 283	✓ 287	✓ 270

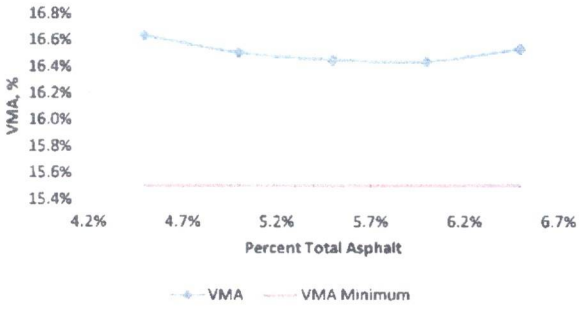
Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

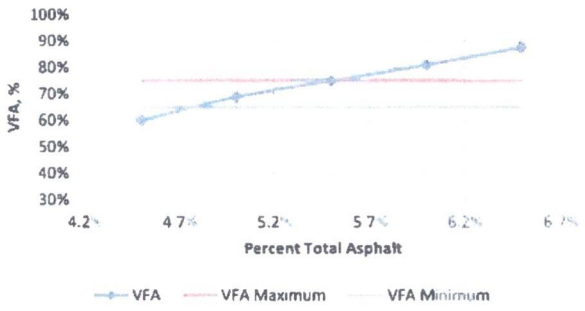
PROPERTY CURVES & DESIRED ASPHALT CONTENT WORKSHEET - 6F RA TOP MIX

PLANT NAME:	Green Asphalt	NYSDOT FACILITY #:	H0385	MIX DESIGN DATE:	11/13/2023

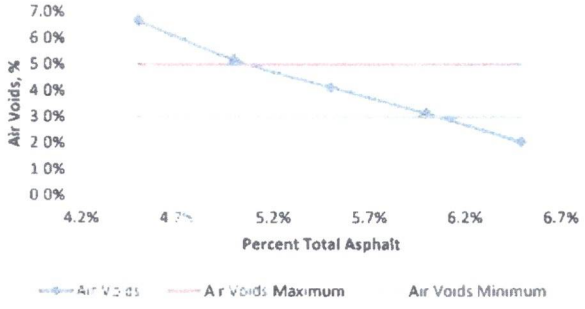
Voids in Mineral Aggregate (VMA)



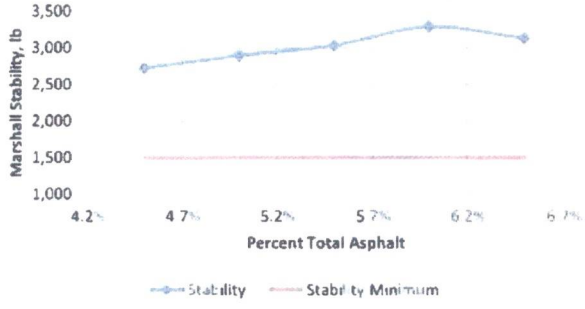
Voids Filled with Asphalt (VFA)



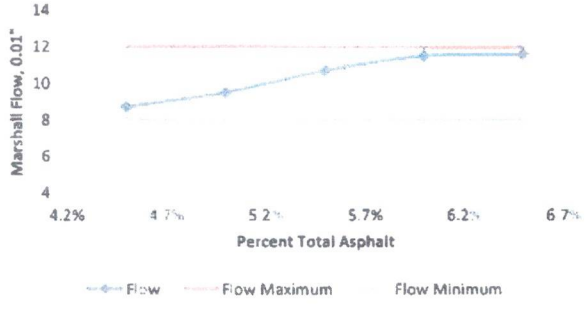
Air Voids (P_a)



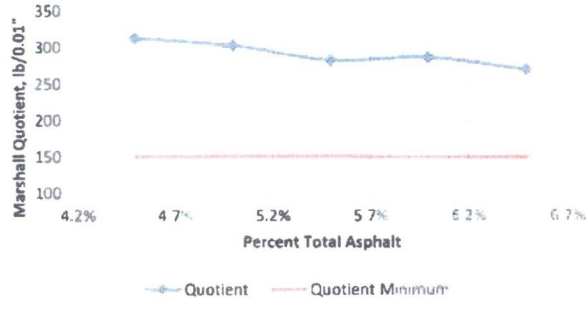
Marshall Stability



Marshall Flow



Marshall Quotient



Property	Low	High
Voids in Mineral Aggregate (VMA), %	4.5%	6.5%
Voids Filled with Asphalt (VFA), %	4.7%	5.6%
Percent Air Voids, (P_a) %	5.0%	6.0%
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	5.0%	5.5%

Properties at Desired AC%
16.5%
71.8%
4.7%
2960
10.1
295.3

Midpoint	5.3%

Desired Total Asphalt Content P_b	5.3%

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