Department of Design and Construction

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Safety & Site Support Division
Office of Quality Assurance

Concrete and Asphalt Generic Mix Design Approval 2024 - 003

Date: **2/21/2024**

To: **Maxon Thomas**
City Asphalt, LLC.

From: **Nader Shehata, PE, Deputy Director**
Office of Quality Assurance Nader Shehata

Date Submitted: 2/7/2024

Plant: City Asphalt, LLC.

NYSDOT Facility Numbers: H0395

Laboratory: N/A

Mix Design Type: 3RA Binder.

Generic Mix Design Serial Number: CityAsphalt/3RA/Binder/Generic/NYCDDC/2/24/003

Generic Mix Design Date: 1/29/2024

Generic Mix Design Expiration Date: 2/28/2026

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: Christopher Vagnone, QA Inspector Christopher Vagnone

Recommended for Acceptance by: Nader Shehata, PE, Deputy Director Nader Shehata

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 3 RA BINDER MIX

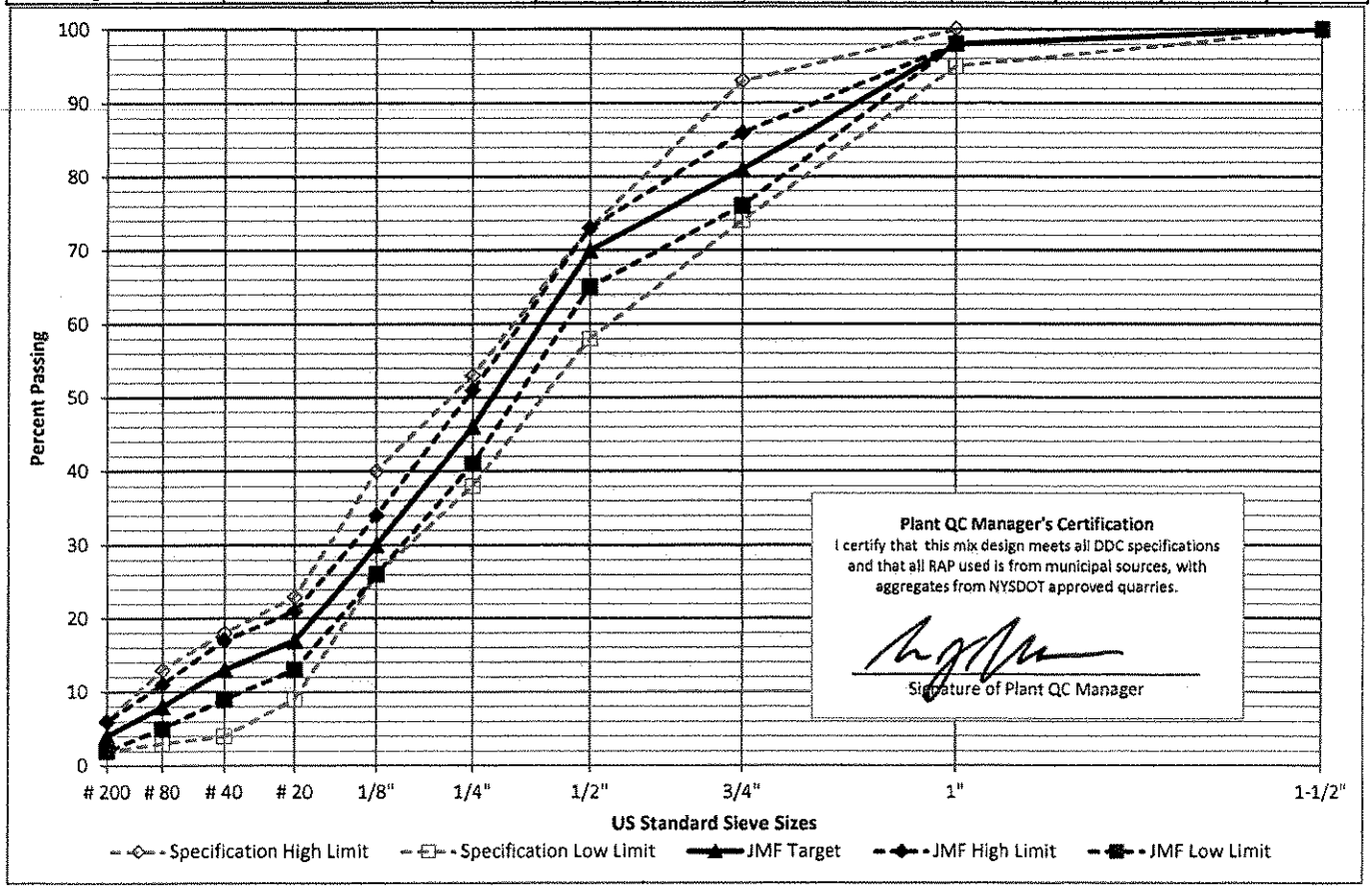
PLANT NAME:	City Asphalt	MIX DESIGN DATE:	1/29/2024
NYSDOT FACILITY #:	H0395	PREPARED BY:	Maxon Thomas
PLANT ADDRESS:	1900 South Ave.	COMPANY:	City Asphalt
	Staten Island, NY 10314	PLANT QC MGR:	Maxon Thomas

Item	Supplier / Quarry	NYSDOT Source	High Friction	Agg. Blend %	Mix %	Lbs / Ton
NY #2 Stone	Tilcon - Clinton Point, NY	8-9R	No	31.7%	31.0%	619
NY #1 stone	Tilcon - West Nyack, NY	8-8R	Yes	22.0%	21.5%	430
					0.0%	0
					0.0%	0
Manufactured sand	Tilcon - Clinton Point, NY	8-9RFM	N/A	6.3%	6.2%	123
			N/A		0.0%	0
Fine RAP	City Asphalt	N/A	Yes	33.7%	32.9%	658
	RAP % Asphalt: 5.6%		RAP AC		1.8%	36
All RAP to be from Municipal Sources - Aggregates from State Quarries			RAP Aggregate		31.1%	622
Coarse RAP	City Asphalt	N/A	Yes	6.3%	6.2%	123
	RAP % Asphalt: 3.0%		RAP AC		0.2%	4
All RAP to be from Municipal Sources - Aggregates from State Quarries			RAP Aggregate		6.0%	119
Virgin Asphalt	Grade: PG64-22	SG (G_b):	1.036		2.3%	46
Total Asphalt Content (P_b):					4.3%	86
				100.0%	100.0%	2,000

Project No: Generic
"APPROVED"
NYC DDC - Office of Quality Assurance
Date: 2/9/2024 Reviewed By: CV
LOG No: 2024-003
QABCS APPROVAL STAMP

CityAsphalt/3RA/Binder/Generic/NYCDDC/2/24/003 Expires: 2/28/2026
QABCS 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	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6	4-6
JMF Target	100	98	81	70	46	30	17	13	8	4	4.3
JMF Range	100-100	98-98	76-86	65-73	41-51	26-34	13-21	9-17	5-11	2-6	4-5



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

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME:	City Asphalt	NYSDOT FACILITY #:	H0395	MIX DESIGN DATE:	1/29/2024

Average Bin Gradations

	NY #2 Stone		NY #1 stone		Not Used		Not Used		Manufactured sand		Not Used		Fine RAP		Coarse RAP	
Sieve	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass	% Ret.	% Pass
1.5"	0.0	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"	8.0	92.0	0.0	100.0		100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
3/4"	53.4	38.6	0.0	100.0		100.0		100.0	0.0	100.0		100.0	0.0	100.0	0.0	100.0
1/2"	29.5	9.1	3.6	96.4		100.0		100.0	0.0	100.0		100.0	0.0	100.0	3.4	96.6
1/4"	6.8	2.3	78.4	18.0		100.0		100.0	0.0	100.0		100.0	3.0	97.0	64.1	32.5
1/8"	1.5	0.8	14.0	4.0		100.0		100.0	6.8	93.2		100.0	32.0	65.0	12.3	20.2
#20	0.3	0.5	1.6	2.4		100.0		100.0	53.4	39.8		100.0	26.0	39.0	8.1	12.1
#40	0.1	0.4	0.5	1.9		100.0		100.0	17.2	22.6		100.0	7.3	31.7	3.5	8.6
#80	0.1	0.3	0.4	1.5		100.0		100.0	12.0	10.6		100.0	12.8	18.9	3.7	4.9
#200	0.1	0.2	0.3	1.2		100.0		100.0	5.6	5.0		100.0	8.7	10.2	2.4	2.5
Pan	0.2		1.2						5.0				10.2		2.5	
Totals	100.0		100.0		0.0		0.0		100.0		0.0		100.0		100.0	

Stockpiles Sampled By: Maxon Thomas Date Sampled: 1/18/2024

Gradation Technician: Maxon Thomas Date Tested: 1/18/2024

Coarse Aggregate Specific Gravity per ASTM C127

Discard portion of sample that passes the 1/8 sieve.

Only Perform this test if aggregate is 10% or more coarse (less than 90% passing the 1/8" sieve)

	NY #2 Stone	NY #1 stone	Not Used	Not Used	Manufactured sand	Not Used	Fine RAP	Coarse RAP
% Coarse Agg.	99.2%	96.0%	---	---	6.8%	---	35.0%	79.8%
Test Required?	YES	YES	NO	NO	NO	NO	YES	YES
A) Wt. in Air	979.6	991.6					952.2	952.2
B) Wt. SSD	986.4	1001.3					960.2	960.2
C) Wt. in Water	634.8	655.0					615.8	615.8
G_{sb} (A/(B-C)	2.786	2.863		---	---	---	2.765	2.765
G_{sa} (A/(A-C)	2.841	2.946	---	---	---	---	2.831	2.831

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 1/8" Sieve.

	NY #2 Stone	NY #1 stone	Not Used	Not Used	Manufactured sand	Not Used	Fine RAP	Coarse RAP
% Fine Agg.	0.8%	4.0%	---	---	93.2%	---	65.0%	20.2%
Test Required?	NO	NO	NO	NO	YES	NO	YES	YES
A) Wt. in Air					497.5		495.5	495.5
B) Wt. Flask + Water					648.2		648.2	648.2
C) Wt. Flask + Water + Sample					972.3		972.3	972.3
S) Wt. SSD					503.7		500.3	500.3
G_{sb} (A/(B+S-C)	---	---	---	---	2.770	---	2.812	2.812
G_{sa} (A/(B+A-C)	---	---	---	---	2.869	---	2.891	2.891

Combined Aggregate Specific Gravity

	NY #2 Stone	NY #1 stone	Not Used	Not Used	Manufactured sand	Not Used	Fine RAP	Coarse RAP
Combined G_{sb}	2.786	2.863	---	---	2.770	---	2.795	2.774
Combined G_{sa}	2.841	2.946	---	---	2.869	---	2.869	2.843

S. G. Technician: Maxon Thomas Date Tested: 1/22/2024

Combined Average Gradations, % Passing

Bin	Agg Blend	1.5"	1"	3/4"	1/2"	1/4"	1/8"	#20	#40	#80	#200
NY #2 Stone	31.7%	31.7	29.2	12.2	2.9	0.7	0.3	0.2	0.1	0.1	0.1
NY #1 stone	22.0%	22.0	22.0	22.0	21.2	4.0	0.9	0.5	0.4	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
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	6.3%	6.3	6.3	6.3	6.3	6.3	5.9	2.5	1.4	0.7	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
Fine RAP	33.7%	33.7	33.7	33.7	33.7	32.7	21.9	13.1	10.7	6.4	3.4
Coarse RAP	6.3%	6.3	6.3	6.3	6.1	2.0	1.3	0.8	0.5	0.3	0.2
Total	100.0%	100.0	97.5	80.5	70.2	45.7	30.2	17.1	13.2	7.8	4.2
Specification Limits		100-100	95-100	74-93	58-73	38-53	26-40	9-23	4-18	3-13	2-6

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT TRIAL GRADATION WORKSHEET - 3 RA BINDER MIX

PLANT NAME:	City Asphalt	NYSDOT FACILITY #:	H0395	MIX DESIGN DATE:	1/29/2024

BATCH 1

Batch P_b: 3.3%
Batch Grams: 5000.0

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	
NY #2 Stone	31.7%	30.7%	1532.7		0.0	122.6	818.5	452.1	104.2	23.0	4.6	1.5	1.5	1.5	3.1	1532.7
NY #1 stone	22.0%	21.3%	1063.7		0.0	0.0	0.0	38.3	833.9	148.9	17.0	5.3	4.3	3.2	12.8	1063.7
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	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
Manufactured sand	6.3%	6.1%	304.6		0.0	0.0	0.0	0.0	0.0	20.7	162.7	52.4	36.6	17.1	15.2	304.6
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
Fine RAP	33.7%	34.5%	1726.1	96.7	0.0	0.0	0.0	0.0	51.8	552.3	448.8	126.0	220.9	150.2	79.4	1726.1
Coarse RAP	6.3%	6.3%	314.0	9.4	0.0	0.0	0.0	10.7	201.3	38.6	25.4	11.0	11.6	7.5	-1.6	314.0
Virgin Asphalt		1.2%	58.9	58.9												58.9
Total Mix	100.0%	100.0%	5000.0	165.0	0.0	122.6	818.5	501.1	1191.2	783.6	658.5	196.2	274.9	179.5	108.9	5000.0

3.30%

BATCH 2

Batch P_b: 3.8%
Batch Grams: 5000.0

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	
NY #2 Stone	31.7%	30.5%	1524.8		0.0	122.0	814.2	449.8	103.7	22.9	4.6	1.5	1.5	1.5	3.0	1524.8
NY #1 stone	22.0%	21.2%	1058.2		0.0	0.0	0.0	38.1	829.6	148.1	16.9	5.3	4.2	3.2	12.7	1058.2
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
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	6.3%	6.1%	303.0		0.0	0.0	0.0	0.0	0.0	20.6	161.8	52.1	36.4	17.0	15.2	303.0
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
Fine RAP	33.7%	34.3%	1717.1	96.2	0.0	0.0	0.0	0.0	51.5	549.5	446.5	125.4	219.8	149.4	79.0	1717.1
Coarse RAP	6.3%	6.2%	312.4	9.4	0.0	0.0	0.0	10.6	200.2	38.4	25.3	10.9	11.6	7.5	-1.6	312.4
Virgin Asphalt		1.7%	84.5	84.5												84.5
Total Mix	100.0%	100.0%	5000.0	190.0	0.0	122.0	814.2	498.5	1185.1	779.5	655.1	195.2	273.5	178.6	108.3	5000.0

3.80%

BATCH 3

Batch P_b: 4.3%
Batch Grams: 5000.0

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	
NY #2 Stone	31.7%	30.3%	1516.8		0.0	121.3	810.0	447.5	103.1	22.8	4.6	1.5	1.5	1.5	3.0	1516.8
NY #1 stone	22.0%	21.1%	1052.7		0.0	0.0	0.0	37.9	825.3	147.4	16.8	5.3	4.2	3.2	12.6	1052.7
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	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
Manufactured sand	6.3%	6.0%	301.5		0.0	0.0	0.0	0.0	0.0	20.5	161.0	51.9	36.2	16.9	15.1	301.5
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
Fine RAP	33.7%	34.2%	1708.2	95.7	0.0	0.0	0.0	0.0	51.2	546.6	444.1	124.7	218.7	148.6	78.6	1708.2
Coarse RAP	6.3%	6.2%	310.8	9.3	0.0	0.0	0.0	10.6	199.2	38.2	25.2	10.9	11.5	7.5	-1.6	310.8
Virgin Asphalt		2.2%	110.0	110.0												110.0
Total Mix	100.0%	100.0%	5000.0	215.0	0.0	121.3	810.0	495.9	1178.9	775.5	651.7	194.2	272.1	177.6	107.8	5000.0

4.30%

BATCH 4

Batch P_b: 4.8%
Batch Grams: 5000.0

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	
NY #2 Stone	31.7%	30.2%	1508.9		0.0	120.7	805.8	445.1	102.6	22.6	4.5	1.5	1.5	1.5	3.0	1508.9
NY #1 stone	22.0%	20.9%	1047.2		0.0	0.0	0.0	37.7	821.0	146.6	16.8	5.2	4.2	3.1	12.6	1047.2
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
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	6.3%	6.0%	299.9		0.0	0.0	0.0	0.0	0.0	20.4	160.1	51.6	36.0	16.8	15.0	299.9
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
Fine RAP	33.7%	34.0%	1699.3	95.2	0.0	0.0	0.0	0.0	51.0	543.8	441.8	124.0	217.5	147.8	78.2	1699.3
Coarse RAP	6.3%	6.2%	309.2	9.3	0.0	0.0	0.0	10.5	198.2	38.0	25.0	10.8	11.4	7.4	-1.5	309.2
Virgin Asphalt		2.7%	135.6	135.6												135.6
Total Mix	100.0%	100.0%	5000.0	240.0	0.0	120.7	805.8	493.3	1172.8	771.4	648.3	193.2	270.6	176.7	107.2	5000.0

4.80%

BATCH 5

Batch P_b: 5.3%
Batch Grams: 5000.0

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	
NY #2 Stone	31.7%	30.0%	1501.0		0.0	120.1	801.5	442.8	102.1	22.5	4.5	1.5	1.5	1.5	3.0	1501.0
NY #1 stone	22.0%	20.8%	1041.7		0.0	0.0	0.0	37.5	816.7	145.8	16.7	5.2	4.2	3.1	12.5	1041.7
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	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
Manufactured sand	6.3%	6.0%	298.3		0.0	0.0	0.0	0.0	0.0	20.3	159.3	51.3	35.8	16.7	14.9	298.3
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
Fine RAP	33.7%	33.8%	1690.4	94.7	0.0	0.0	0.0	0.0	50.7	540.9	439.5	123.4	216.4	147.1	77.8	1690.4
Coarse RAP	6.3%	6.2%	307.5	9.2	0.0	0.0	0.0	10.5	197.1	37.8	24.9	10.8	11.4	7.4	-1.5	307.5
Virgin Asphalt		3.2%	161.1	161.1												161.1
Total Mix	100.0%	100.0%	5000.0	265.0	0.0	120.1	801.5	490.8	1166.6	767.4	644.9	192.2	269.2	175.8	106.6	5000.0

5.30%

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME:	City Asphalt	NYSDOT FACILITY #:	H0395	MIX DESIGN DATE:	1/29/2024

Theoretical Maximum Specific Gravity G_{mm} per ASTM D2041

Trial Batch	1		2		3		4		5	
P_b	3.3%		3.8%		4.3%		4.8%		5.3%	
A) Sample in Air (grams)	2003.8	1994.3	1995.1	2001.1	1997.4	1999.6	2001.8	1997.7	2004.4	1994.1
B) Pycnometer in Water (Grams)	1432.6	1440.1	1432.6	1440.1	1432.6	1440.1	1432.6	1440.1	1432.6	1440.1
C) Sample & Pycnometer in Water (Grams)	2690.4	2693.0	2675.3	2687.2	2671.5	2679.4	2667.6	2674.1	2665.3	2664.7
G_{mm} *(A/(A+B-C))*	2.686	2.690	2.652	2.654	2.633	2.630	2.611	2.616	2.597	2.591
Average G_{mm}	2.688		2.653		2.632		2.613		2.594	

Density Technician: Maxon Thomas Date Tested: 1/23/2024

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 = 3.3%								
Specimen A	1308.8	1314.5	792.1	522.4	2.505	2.688	6.8%		3976	1	3980	9.2	433
Specimen B	1310.4	1316.6	793.3	523.3	2.504	2.688	6.8%		4055	0.96	3890	9.5	409
Specimen C	1311.7	1318.2	793.2	525.0	2.498	2.688	7.1%		3880	0.96	3720	10.0	372
Average					2.503	2.688	6.9%	156.2			3860	9.6	405
TRIAL BATCH 2					P_b = 3.8%								
Specimen A	1312.6	1316.1	793.2	522.9	2.510	2.653	5.4%		3671	1	3670	10.4	353
Specimen B	1309.1	1315.5	794.3	521.2	2.512	2.653	5.3%		3845	1	3850	10.2	377
Specimen C	1310.5	1316.6	793.7	522.9	2.506	2.653	5.5%		3920	1	3920	9.8	400
Average					2.509	2.653	5.4%	156.6			3810	10.1	377
TRIAL BATCH 3					P_b = 4.3%								
Specimen A	1310.6	1313.8	795.1	518.7	2.527	2.632	4.0%		3533	1	3530	10.9	324
Specimen B	1309.8	1313.0	794.2	518.8	2.525	2.632	4.1%		3612	1	3610	11.2	322
Specimen C	1311.3	1314.4	796.2	518.2	2.530	2.632	3.9%		3490	1	3490	10.6	329
Average					2.527	2.632	4.0%	157.7			3540	10.9	325
TRIAL BATCH 4					P_b = 4.8%								
Specimen A	1309.5	1312.1	797.7	514.4	2.546	2.613	2.6%		2895	1	2900	11.5	252
Specimen B	1311.3	1314.0	798.6	515.4	2.544	2.613	2.6%		3038	1	3040	11.8	258
Specimen C	1308.8	1312.2	798.0	514.2	2.545	2.613	2.6%		3145	1	3150	11.4	276
Average					2.545	2.613	2.6%	158.8			3030	11.6	262
TRIAL BATCH 5					P_b = 5.3%								
Specimen A	1309.9	1311.0	799.4	511.6	2.560	2.594	1.3%		2863	1	2860	11.8	242
Specimen B	1311.6	1312.5	800.6	511.9	2.562	2.594	1.2%		2618	1	2620	12.3	213
Specimen C	1312.5	1313.4	801.0	512.4	2.561	2.594	1.3%		2688	1	2690	12.6	213
Average					2.561	2.594	1.3%	159.8			2720	12.2	223

Marshall Technician: Maxon Thomas Date Tested: 1/23/2024

Department of Design and Construction

QA & CONSTRUCTION SAFETY BUREAU

MIX VOLUMETRIC PROPERTIES WORKSHEET - 3 RA BINDER MIX

PLANT:	City Asphalt	NYSDOT FACILITY #:	H0395	MIX DESIGN DATE:	1/29/2024

Agg. Blend %	Constituent Material	NYSDOT Source	G_{sa}	G_{sb}	Total Mix Composition by Weight				
					Trial Batch				
					1	2	3	4	5
31.7%	NY #2 Stone	8-9R	2.841	2.786	30.7%	30.5%	30.3%	30.2%	30.0%
22.0%	NY #1 stone	8-8R	2.946	2.863	21.3%	21.2%	21.1%	20.9%	20.8%
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%
6.3%	Manufactured sand	8-9RFM	2.869	2.770	6.1%	6.1%	6.0%	6.0%	6.0%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
33.7%	Fine RAP		2.869	2.795	34.5%	34.3%	34.2%	34.0%	33.8%
6.3%	Coarse RAP		2.843	2.774	6.3%	6.2%	6.2%	6.2%	6.2%
	Virgin Asphalt				1.2%	1.7%	2.2%	2.7%	3.2%
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, %			3.3%	3.8%	4.3%	4.8%	5.3%
P_{ba}	Percent Absorbed Asphalt Binder, %			0.51%	0.30%	0.31%	0.34%	0.37%
P_{be}	Percent Effective Asphalt Binder, %			2.81%	3.51%	4.00%	4.48%	4.95%
DP	Dust Proportion (0.6 to 1.2 desired)			0.7	0.8	1.0	1.1	1.2
G_{mm}	Mix Maximum Specific Gravity			2.688	2.653	2.632	2.613	2.594
G_{mb}	Mix Bulk Specific Gravity			2.503	2.509	2.527	2.545	2.561
G_{sb}	Aggregate Bulk Gravity			2.804	2.804	2.804	2.804	2.804
G_{se}	Aggregate Effective Gravity			2.843	2.827	2.828	2.830	2.832
G_{sa}	Aggregate Apparent Specific Gravity			2.875	2.875	2.875	2.875	2.875

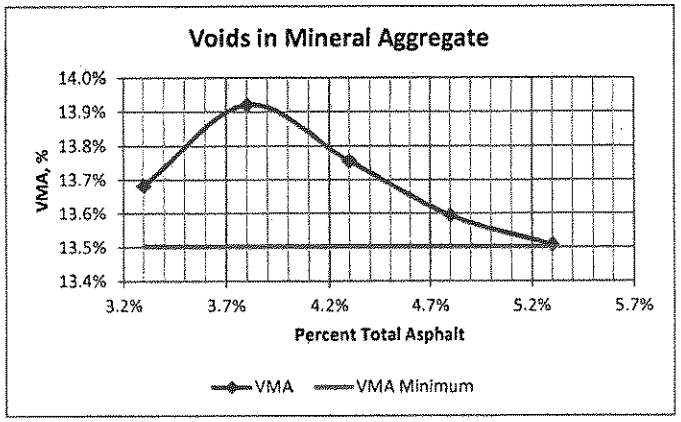
Mix Acceptance Properties		Low Limit	High Limit	Trial Batch				
				1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	13.5%		✓ 13.7%	✓ 13.9%	✓ 13.8%	✓ 13.6%	✓ 13.5%
	Note: All five trial batches must meet the minimum VMA requirement.							
VFA	Voids Filled with Asphalt, %	65%	75%	✗ 49.7%	✗ 61.0%	✓ 71.0%	✗ 80.9%	✗ 90.6%
P_a	Percent Air Voids, %	3.0%	5.0%	✗ 6.9%	✗ 5.4%	✓ 4.0%	✗ 2.6%	✗ 1.3%
---	Marshall Stability (Corrected), lb	1500		✓ 3860	✓ 3810	✓ 3540	✓ 3030	✓ 2720
---	Marshall Flow, 0.01"	8	12	✓ 9.6	✓ 10.1	✓ 10.9	✓ 11.6	✗ 12.2
---	Marshall Quotient, lb/0.01"	150		✓ 405	✓ 377	✓ 325	✓ 262	✓ 223

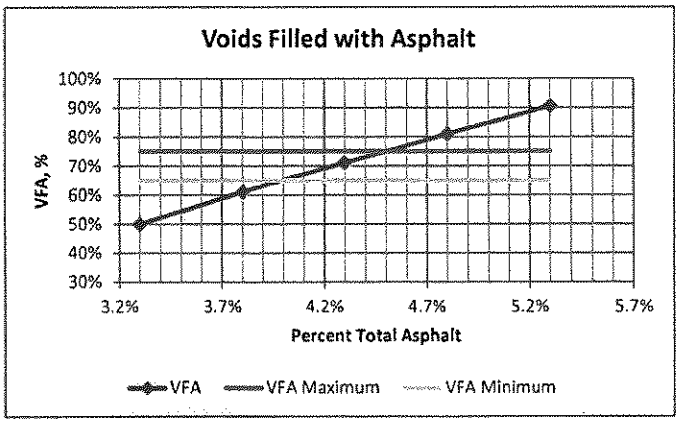
Department of Design and Construction

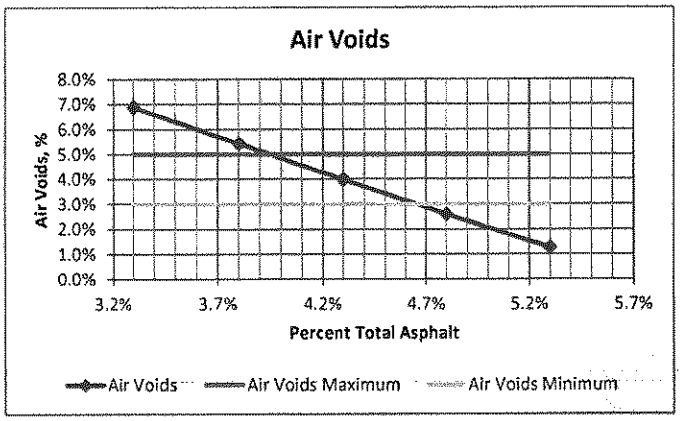
QA & CONSTRUCTION SAFETY BUREAU

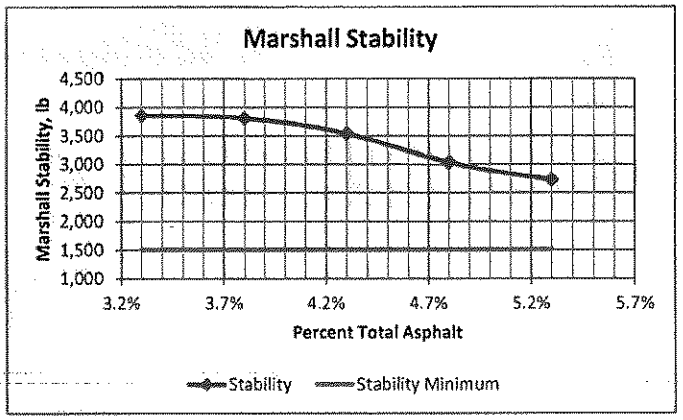
PROPERTY CURVES & DESIRED ASPHALT CONTENT WORKSHEET - 3 RA BINDER MIX

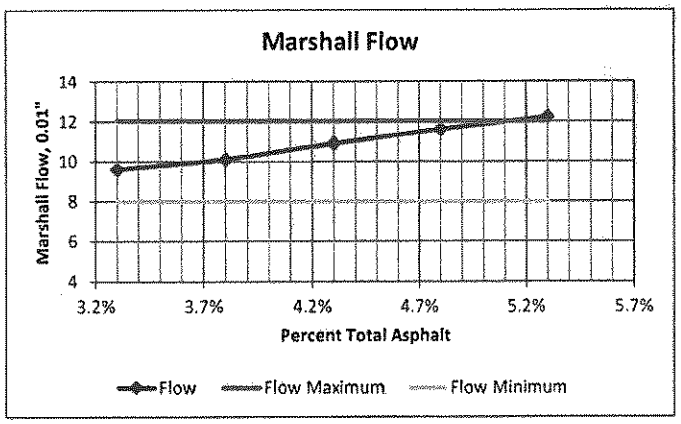
PLANT NAME:	City Asphalt	NYSDOT FACILITY #:	H0395	MIX DESIGN DATE:	1/29/2024

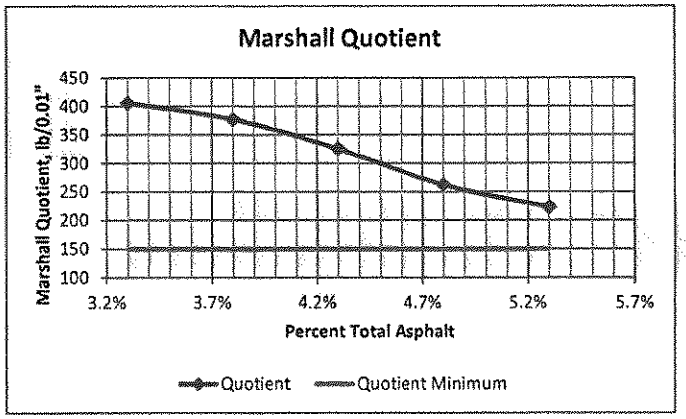












Property	High	Low
Voids in Mineral Aggregate (VMA), %	5.3%	3.3%
Voids Filled with Asphalt (VFA), %	4.5%	4.0%
Percent Air Voids, %	4.7%	3.9%
Marshall Stability (Corrected), lb	5.3%	3.3%
Marshall Flow, 0.01"	5.2%	3.3%
Marshall Quotient, lb/0.01"	5.3%	3.3%
Overlap	5.3%	3.3%

Properties at Desired AC%
13.8%
71.0%
4.0%
3540
10.9
318.4

Midpoint	4.3%

Desired Total Asphalt Content P_b	*4.3%*

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.