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 - 002

Date: **2/7/2024**

To: **Larry Santana**
Willets Point Asphalt Corp.

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

Date Submitted: 2/2/2024

Plant: Willets Point Asphalt Corp.

NYSDOT Facility Numbers: H0354

Laboratory: N/A

Mix Design Type: 6FRA Top

Generic Mix Design Serial Number: WilletsPointAsphalt/6FRA/Top/Generic/NYCDDC/2/24/002

Generic Mix Design Date: 1/8/2024

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: Scott Cruz, QA Inspector

Recommended for Acceptance by: Juan Martinez, PE, Director

WILLETS POINT ASPHALT QUALITY CONTROL

ASPHALT JOB MIX FORMULA SHEET - 6FRA TOP

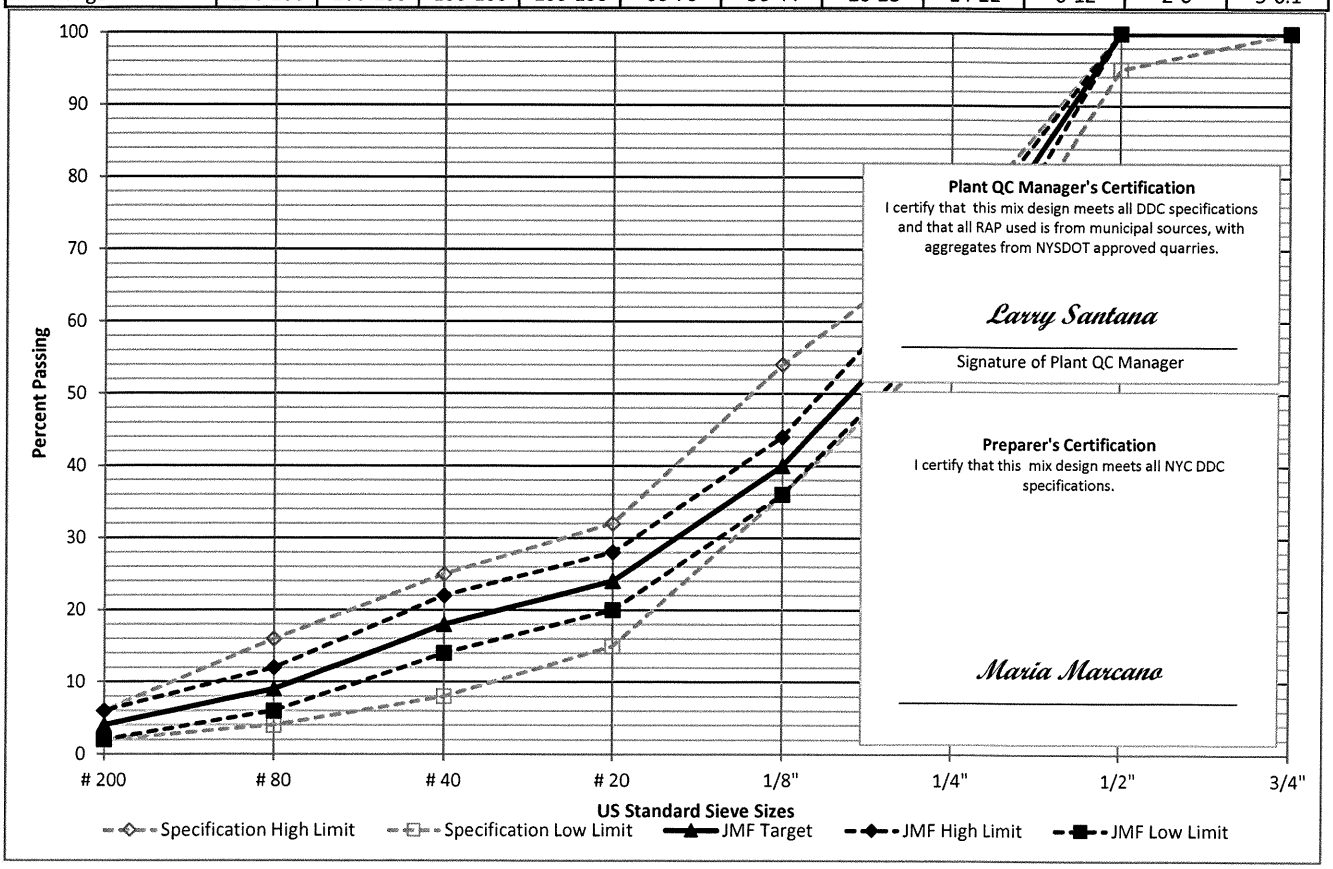
PLANT NAME:	WILLETS POINT ASPHALT	MIX DESIGN DATE:	1/8/2024
NYSDOT FACILITY #:	H0354	PREPARED BY:	MARIA MARCANO
PLANT ADDRESS:	FLUSHING	COMPANY:	WILLETS POINT ASPHALT
	New York, NY	PLANT QC MGR:	LARRY SANTANA

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_b):	1.034		3.6%	72
Total Asphalt Content (P_b)						5.4%	108
					100.0%	100.0%	2,000

Project No: Generic.
"APPROVED"
NYC DDC - Office of Quality Assurance
Date: 2/5/24 Reviewed By: SC
LOG No: 2024-002
DDC APPROVAL STAMP

WilletsPointAsphalt/6FRA/Top/Generic/NYCDDC/2/24/002 Expires: 2/28/2026

Sieve Size	1-1/2"	1"	3/4"	1/2"	1/4"	1/8"	# 20	# 40	# 80	# 200	P_b
Specification Limits	100-100	100-100	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	65	40	24	18	9	4	5.4
JMF Range	100-100	100-100	100-100	100-100	60-70	36-44	20-28	14-22	6-12	2-6	5-6.1



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.

Larry Santana
Signature of Plant QC Manager

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

Maria Marcano

WILLETS POINT ASPHALT QUALITY CONTROL

ASPHALT COMBINED GRADATION WORKSHEET - 6F RA TOP

PLANT NAME:	WILLETS POINT ASPHALT	NYSDOT FACILITY #:	H0354	MIX DESIGN DATE:	1/8/2024

Average Bin Gradations

	Not Used		#1 Stone		#1A Stone		Not Used		Manufactured Sand		Screenings		RAP		Not Used	
Sieve	% 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	1.2	98.8	0.0	100.0		100.0	0.0	100.0	0.0	100.0	0.0	100.0		100.0
1/4"		100.0	85.6	13.2	12.6	87.4		100.0	0.0	100.0	0.5	99.5	25.6	74.4		100.0
1/8"		100.0	12.5	0.7	75.6	11.8		100.0	5.2	94.8	11.9	87.6	21.6	52.8		100.0
#20		100.0	0.0	0.7	10.2	1.6		100.0	36.5	58.3	38.5	49.1	18.6	34.2		100.0
#40		100.0	0.0	0.7	0.0	1.6		100.0	17.6	40.7	14.6	34.5	9.2	25.0		100.0
#80		100.0	0.0	0.7	0.0	1.6		100.0	21.3	19.4	15.2	19.3	11.2	13.8		100.0
#200		100.0	0.0	0.7	0.0	1.6		100.0	13.6	5.8	7.5	11.8	6.2	7.6		100.0
Pan			0.7		1.6				5.8		11.8		7.6			
Totals	0.0		100.0		100.0		0.0		100.0		100.0		100.0		0.0	

Stockpiles Sampled By:	MARIA MARCANO	Date Sampled:	1/8/2024
Gradation Technician:	MARIA MARCANO	Date Tested:	1/8/2024

Coarse Aggregates 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.	---	86.8%	12.6%	---	0.0%	0.5%	25.6%	---
Test Required?	NO	YES	YES	NO	NO	NO	YES	NO
A) Wt. in Air		1518.0	1472.2				1016.2	
B) Wt. SSD		1520.0	1478.3				1021.4	
C) Wt. in Water		953.0	926.4				641.2	
G_{sb} (A/(B-C)	---	2.677	2.668	---	---	---	2.673	---
G_{sa} (A/(A-C)	---	2.687	2.697	---	---	---	2.710	---

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 coarse (less than 90% passes the 1/4" Sieve)

	Not Used	#1 Stone	#1A Stone	Not Used	Manufactured Sand	Screenings	RAP	Not Used
% Fine Agg.	---	13.2%	87.4%	---	100.0%	99.5%	74.4%	---
Test Required?	NO	YES	YES	NO	YES	YES	YES	NO
A) Wt. in Air		1512.2	1478.2		498.6	499.6	1020.6	
B) Wt. Flask + Water		0.0	0.0		681.2	683.2	0.0	
C) Wt. Flask + Water + Sample		954.6	930.2		992.5	998.2	640.5	
S) Wt. SSD		1518.2	1480.6		501.2	501.3	1025.6	
G_{sb} (A/(B+S-C)	---	2.683	2.686	---	2.626	2.682	2.650	---
G_{sa} (A/(B+A-C)	---	2.712	2.697	---	2.662	2.706	2.685	---

Combined Aggregate Specific Gravity

	Not Used	#1 Stone	#1A Stone	Not Used	Manufactured Sand	Screenings	RAP	Not Used
Combined G_{sb}	---	2.678	2.683	---	2.626	2.682	2.656	---
Combined G_{sa}	---	2.690	2.697	---	2.662	2.706	2.691	---

S. G. Technician:	MARIA MACANO	Date Tested:	1/8/2024

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	28.4	3.8	0.2	0.2	0.2	0.2	0.2
#1A Stone	18.0%	18.0	18.0	18.0	18.0	15.7	2.1	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
Manufactured Sand	23.3%	23.3	23.3	23.3	23.3	23.3	22.1	13.6	9.5	4.5	1.4
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	22.3	15.8	10.3	7.5	4.1	2.3
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0%	100.0	100.0	100.0	99.7	65.1	40.3	24.3	17.5	9.1	4.1
Specification Limits		100-100	100-100	100-100	95-100	58-72	36-54	15-32	8-25	4-16	2-6

WILLETS POINT ASPHALT QUALITY CONTROL

ASPHALT TRIAL GRADATION WORKSHEET - 6F RA TOP

PLANT NAME:	WILLETS POINT ASPHALT	NYSDOT FACILITY #:	H0354	MIX DESIGN DATE:	1/8/2024

BATCH 1

Batch P_b: 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	*0.0*
#1 Stone	28.7%	27.4%	335.8		0.0	0.0	0.0	4.0	287.4	42.0	0.0	0.0	0.0	0.0	2.4	*335.8*
#1A Stone	18.0%	17.2%	210.6		0.0	0.0	0.0	0.0	26.5	159.2	21.5	0.0	0.0	0.0	3.4	*210.6*
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*
Manufactured Sand	23.3%	22.3%	272.6		0.0	0.0	0.0	0.0	0.0	14.2	99.5	48.0	58.1	37.1	15.8	*272.6*
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	*0.0*
RAP	30.0%	30.5%	374.2	23.2	0.0	0.0	0.0	0.0	95.8	80.8	69.6	34.4	41.9	23.2	5.2	*374.2*
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*
Virgin Asphalt		2.6%	31.9	31.9												*31.9*
Total Mix	100.0%	100.0%	1225.0	55.1	0.0	0.0	0.0	4.0	409.7	296.2	190.6	82.4	100.0	60.3	26.8	*1225.0*
				4.50%												

BATCH 2

Batch P_b: 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	*0.0*
#1 Stone	28.7%	27.3%	334.0		0.0	0.0	0.0	4.0	285.9	41.7	0.0	0.0	0.0	0.0	2.3	*334.0*
#1A Stone	18.0%	17.1%	209.5		0.0	0.0	0.0	0.0	26.4	158.4	21.4	0.0	0.0	0.0	3.4	*209.5*
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*
Manufactured Sand	23.3%	22.1%	271.2		0.0	0.0	0.0	0.0	0.0	14.1	99.0	47.7	57.8	36.9	15.7	*271.2*
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	*0.0*
RAP	30.0%	30.4%	372.2	23.1	0.0	0.0	0.0	0.0	95.3	80.4	69.2	34.2	41.7	23.1	5.2	*372.2*
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*
Virgin Asphalt		3.1%	38.2	38.2												*38.2*
Total Mix	100.0%	100.0%	1225.0	61.3	0.0	0.0	0.0	4.0	407.6	294.6	189.6	82.0	99.4	60.0	26.6	*1225.0*
				5.00%												

BATCH 3

Batch P_b: 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	*0.0*
#1 Stone	28.7%	27.1%	332.2		0.0	0.0	0.0	4.0	284.4	41.5	0.0	0.0	0.0	0.0	2.3	*332.2*
#1A Stone	18.0%	17.0%	208.4		0.0	0.0	0.0	0.0	26.3	157.5	21.3	0.0	0.0	0.0	3.3	*208.4*
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*
Manufactured Sand	23.3%	22.0%	269.7		0.0	0.0	0.0	0.0	0.0	14.0	98.5	47.5	57.5	36.7	15.6	*269.7*
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	*0.0*
RAP	30.0%	30.2%	370.2	23.0	0.0	0.0	0.0	0.0	94.8	80.0	68.9	34.1	41.5	23.0	5.2	*370.2*
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*
Virgin Asphalt		3.6%	44.4	44.4												*44.4*
Total Mix	100.0%	100.0%	1225.0	67.4	0.0	0.0	0.0	4.0	405.4	293.1	188.6	81.5	98.9	59.6	26.5	*1225.0*
				5.50%												

BATCH 4

Batch P_b: 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	*0.0*
#1 Stone	28.7%	27.0%	330.5		0.0	0.0	0.0	4.0	282.9	41.3	0.0	0.0	0.0	0.0	2.3	*330.5*
#1A Stone	18.0%	16.9%	207.3		0.0	0.0	0.0	0.0	26.1	156.7	21.1	0.0	0.0	0.0	3.3	*207.3*
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*
Manufactured Sand	23.3%	21.9%	268.3		0.0	0.0	0.0	0.0	0.0	14.0	97.9	47.2	57.1	36.5	15.6	*268.3*
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	*0.0*
RAP	30.0%	30.1%	368.3	22.8	0.0	0.0	0.0	0.0	94.3	79.5	68.5	33.9	41.2	22.8	5.2	*368.3*
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*
Virgin Asphalt		4.1%	50.7	50.7												*50.7*
Total Mix	100.0%	100.0%	1225.0	73.5	0.0	0.0	0.0	4.0	403.3	291.5	187.6	81.1	98.4	59.3	26.3	*1225.0*
				6.00%												

BATCH 5

Batch P_b: 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	*0.0*
#1 Stone	28.7%	26.8%	328.7		0.0	0.0	0.0	3.9	281.4	41.1	0.0	0.0	0.0	0.0	2.3	*328.7*
#1A Stone	18.0%	16.8%	206.2		0.0	0.0	0.0	0.0	26.0	155.9	21.0	0.0	0.0	0.0	3.3	*206.2*
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*
Manufactured Sand	23.3%	21.8%	266.9		0.0	0.0	0.0	0.0	0.0	13.9	97.4	47.0	56.8	36.3	15.5	*266.9*
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	*0.0*
RAP	30.0%	29.9%	366.3	22.7	0.0	0.0	0.0	0.0	93.8	79.1	68.1	33.7	41.0	22.7	5.1	*366.3*
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*
Virgin Asphalt		4.6%	56.9	56.9												*56.9*
Total Mix	100.0%	100.0%	1225.0	79.6	0.0	0.0	0.0	3.9	401.1	290.0	186.6	80.7	97.9	59.0	26.2	*1225.0*
				6.50%												

WILLETS POINT ASPHALT QULAITY CONTROL

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

PLANT NAME:	WILLETS POINT ASPHALT	NYSDOT FACILITY #:	1/8/2024	MIX DESIGN DATE:	1/8/2024

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)	2020.0	2011.7	2010.0	2015.8	2010.5	2008.6	2021.8	2010.4	2051.3	2032.4
B) Pycnometer in Water (Grams)	1375.2	1380.1	1375.2	1380.1	1375.2	1380.1	1375.2	1380.1	1375.2	1380.1
C) Sample & Pycnometer in Water (Grams)	2592.7	2593.5	2581.2	2589.3	2574.4	2579.4	2575.5	2573.3	2587.5	2579.2
G_{mm} *(A/(A+B-C))*	2.517	2.520	2.500	2.499	2.478	2.482	2.461	2.460	2.445	2.439
Average G_{mm}	2.519		2.500		2.480		2.461		2.442	

Density Technician: MARIA MARCANO Date Tested: 1/8/2024

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 = 4.5%										
Specimen A	1223.5	1225.6	702.3	523.3	2.338	2.519	7.18%		2550	0.96	2450	9.0	272
Specimen B	1220.5	1222.3	701.6	520.7	2.344	2.519	6.95%		2600	1	2600	8.0	325
RATE OF 0.5%	1222.2	1224.5	703.5	521.0	2.346	2.519	6.87%		2575	1	2580	9.5	272
Average					2.343	2.519	6.99%	146.2			2540	8.8	290
TRIAL BATCH 2			P_b = 5.0%										
Specimen A	1224.6	1226.5	708.9	517.6	2.366	2.500	5.36%		2800	1	2800	9.0	311
Specimen B	1222.3	1224.9	706.5	518.4	2.358	2.500	5.69%		2850	1	2850	9.5	300
Specimen C	1225.3	1227.8	704.3	523.5	2.341	2.500	6.38%		2975	0.96	2860	9.5	301
Average					2.355	2.500	5.80%	147.0			2840	9.3	304
TRIAL BATCH 3			P_b = 5.5%										
Specimen A	1224.8	1225.8	712.1	513.7	2.384	2.480	3.86%		3375	1	3380	10.0	338
Specimen B	1225.1	1227.0	709.8	517.2	2.369	2.480	4.49%		3150	1	3150	10.5	300
Specimen C	1222.7	1224.4	708.9	515.5	2.372	2.480	4.36%		3075	1	3080	11.0	280
Average					2.375	2.480	4.23%	148.2			3200	10.5	306
TRIAL BATCH 4			P_b = 6.0%										
Specimen A	1235.6	1237.2	715.6	521.6	2.369	2.461	3.74%		2975	1	2980	11.0	271
Specimen B	1234.8	1236.8	720.3	516.5	2.391	2.461	2.86%		3000	1	3000	11.0	273
Specimen C	1238.3	1240.6	719.8	520.8	2.378	2.461	3.39%		2850	1	2850	11.5	248
Average					2.379	2.461	3.33%	148.4			2940	11.2	264
TRIAL BATCH 5			P_b = 6.5%										
Specimen A	1240.5	1242.6	721.3	521.3	2.380	2.442	2.55%		2675	1	2680	11.5	233
Specimen B	1239.6	1241.7	722.8	518.9	2.389	2.442	2.17%		2500	1	2500	12.0	208
Specimen C	1241.3	1243.6	720.6	523.0	2.373	2.442	2.81%		2475	1	2480	12.0	207
Average					2.381	2.442	2.50%	148.6			2550	11.8	216

Marshall Technician: MARIA MARCANO Date Tested: 1/8/2024

WILLETS POINT ASPHALT QUALITY CONTROL

MIX VOLUMETRIC PROPERTIES WORKSHEET - 6F RA TOP

PLANT:	WILLETS POINT ASPHALT	NYSDOT FACILITY #:	H0354	MIX DESIGN DATE:	1/8/2024

Agg. Blend %	Constituent Material	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%
28.7%	#1 Stone	8-32R	2.690	2.678	27.4%	27.3%	27.1%	27.0%	26.8%
18.0%	#1A Stone	8-32R	2.697	2.683	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	2.662	2.626	22.3%	22.1%	22.0%	21.9%	21.8%
0.0%	Screenings	8-32R	2.706	2.682	0.0%	0.0%	0.0%	0.0%	0.0%
30.0%	RAP		2.691	2.656	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%

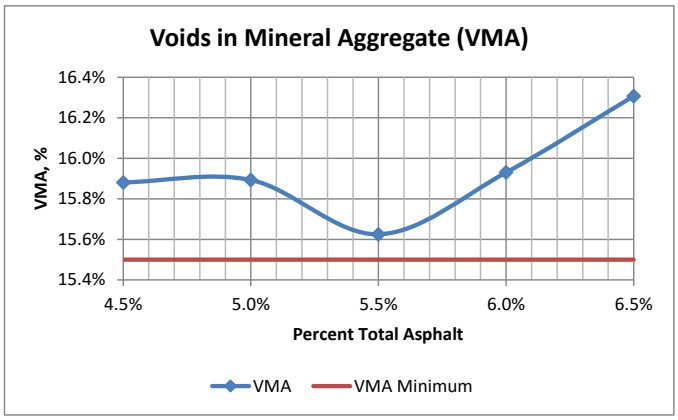
Mix General Properties				Trial Batch				
				1	2	3	4	5
P_b	Percent Total Asphalt Binder, %			4.5%	5.0%	5.5%	6.0%	6.5%
P_{ba}	Percent Absorbed Asphalt Binder, %			0.60%	0.60%	0.58%	0.56%	0.53%
P_{be}	Percent Effective Asphalt Binder, %			3.92%	4.43%	4.96%	5.47%	6.00%
DP	Dust Proportion (0.6 - 1.2 desired)			1.0	1.1	1.2	1.3	1.5
ATE OF 0.5	Mix Maximum Specific Gravity			2.519	2.500	2.480	2.461	2.442
G_{mb}	Mix Bulk Specific Gravity			2.343	2.355	2.375	2.379	2.381
G_{sb}	Aggregate Bulk Gravity			2.660	2.660	2.660	2.660	2.660
G_{se}	Aggregate Effective Gravity			2.702	2.702	2.700	2.699	2.697
G_{sa}	Aggregate Apparent Specific Gravity			2.685	2.685	2.685	2.685	2.685

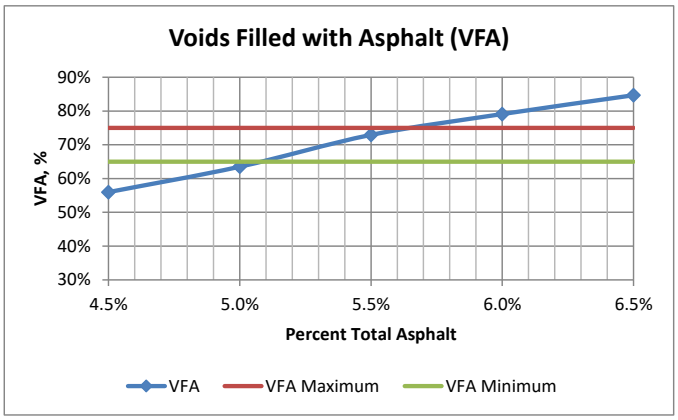
Mix Acceptance Properties		Low Limit	High Limit	Trial Batch				
				1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	15.5%		15.9%	15.9%	15.6%	15.9%	16.3%
	Note: All five trial batches must meet the minimum VMA requirement.							
VFA	Voids Filled with Asphalt, %	65%	75%	56.0%	63.5%	72.9%	79.1%	84.7%
P_a	Percent Air Voids, %	3.0%	5.0%	7.0%	5.8%	4.2%	3.3%	2.5%
---	Marshall Stability (Corrected), lb	1500		2540	2840	3200	2940	2550
---	Marshall Flow, 0.01"	8	12	8.8	9.3	10.5	11.2	11.8
---	Marshall Quotient, lb/0.01"	150		290	304	306	264	216

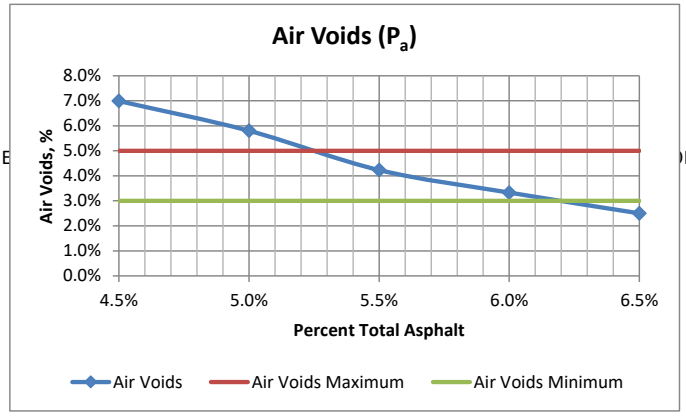
WILLETS POINT ASPHALT QUALITY CONTROL

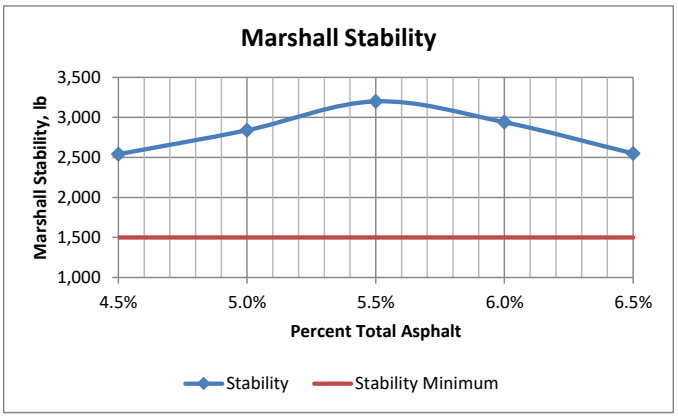
PROPERTY CURVES & DESIRED ASPHALT CONTENT WORKSHEET - 6F RA TOP

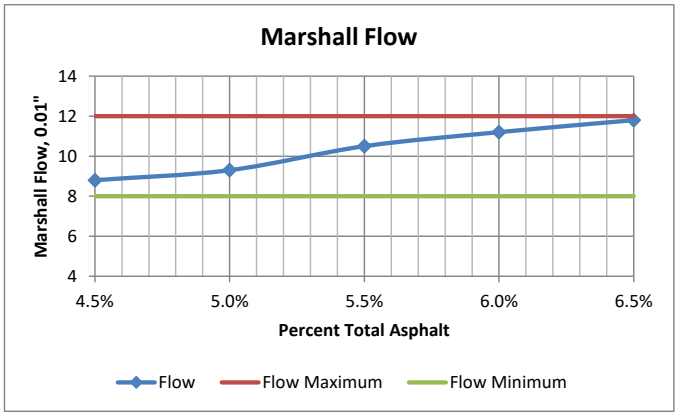
PLANT NAME:	WILLETS POINT ASPHALT	NYSDOT FACILITY #:	1/8/2024	MIX DESIGN DATE:	1/8/2024

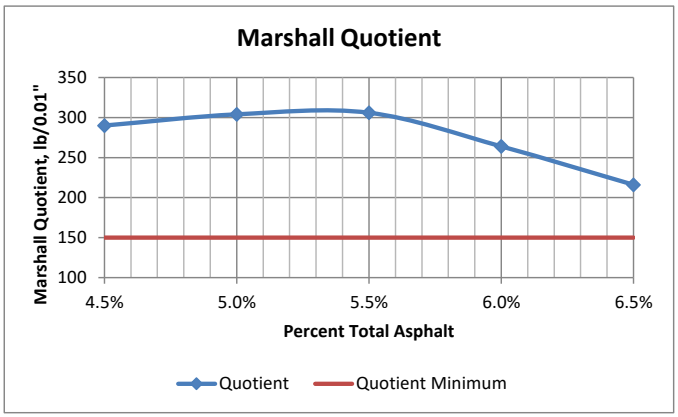












Property	Low	High
Voids in Mineral Aggregate (VMA), %	4.5%	6.5%
Voids Filled with Asphalt (VFA), %	4.9%	5.6%
Percent Air Voids, (P_a) %	5.2%	6.0%
Marshall Stability (Corrected), lb	4.5%	6.5%
Marshall Flow, 0.01"	4.5%	6.5%
Marshall Quotient, lb/0.01"	4.5%	6.5%
Overlap	5.2%	5.6%

Properties at Desired AC%
15.9%
69.8%
4.8%
2810
10.2
279.8

Midpoint	**5.4%**

Desired Total Asphalt Content P_b	***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.