



**Department of
Design and
Construction**

Thomas Foley
Acting Commissioner

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

Concrete Generic Mix Design Approval # 2022-001

Alla Ayzenshtat
Associate Commissioner
Safety & Site Support

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Date: 1/3/2022
To: **Larry Santana**
Willets Point Asphalt Corp.
From: **Juan Martinez, PE, Deputy Director**
Office of Quality Assurance

Date Submitted: 12/28/2021

Plant: Willets Point Asphalt Corp.

NYSDOT Facility Numbers: H0354

Laboratory: N/A

Mix Design Type: 3RA Binder

Generic Mix Design Serial Number: WilletsPointAsphalt/3RA/Binder/Generic/NYCDDC/001/22

Generic Mix Design – Mix Design Date: 12/28/2021

Generic Mix Design – Expiration Date: 1/31/2024 (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: Christopher Vagnone, QA Inspector

Christopher Vagnone

Recommended for Acceptance by: Kelvin Law, PE, Engineer In Charge

[Signature]

QA & CONSTRUCTION SAFETY BUREAU

ASPHALT JOB MIX FORMULA SHEET - 3 RA BINDER MIX

PLANT NAME: **WILLETS POINT ASPHALT CORP**
 NYSDOT FACILITY #: **H0354**
 PLANT ADDRESS: **FLUSHING**
NEW YORK

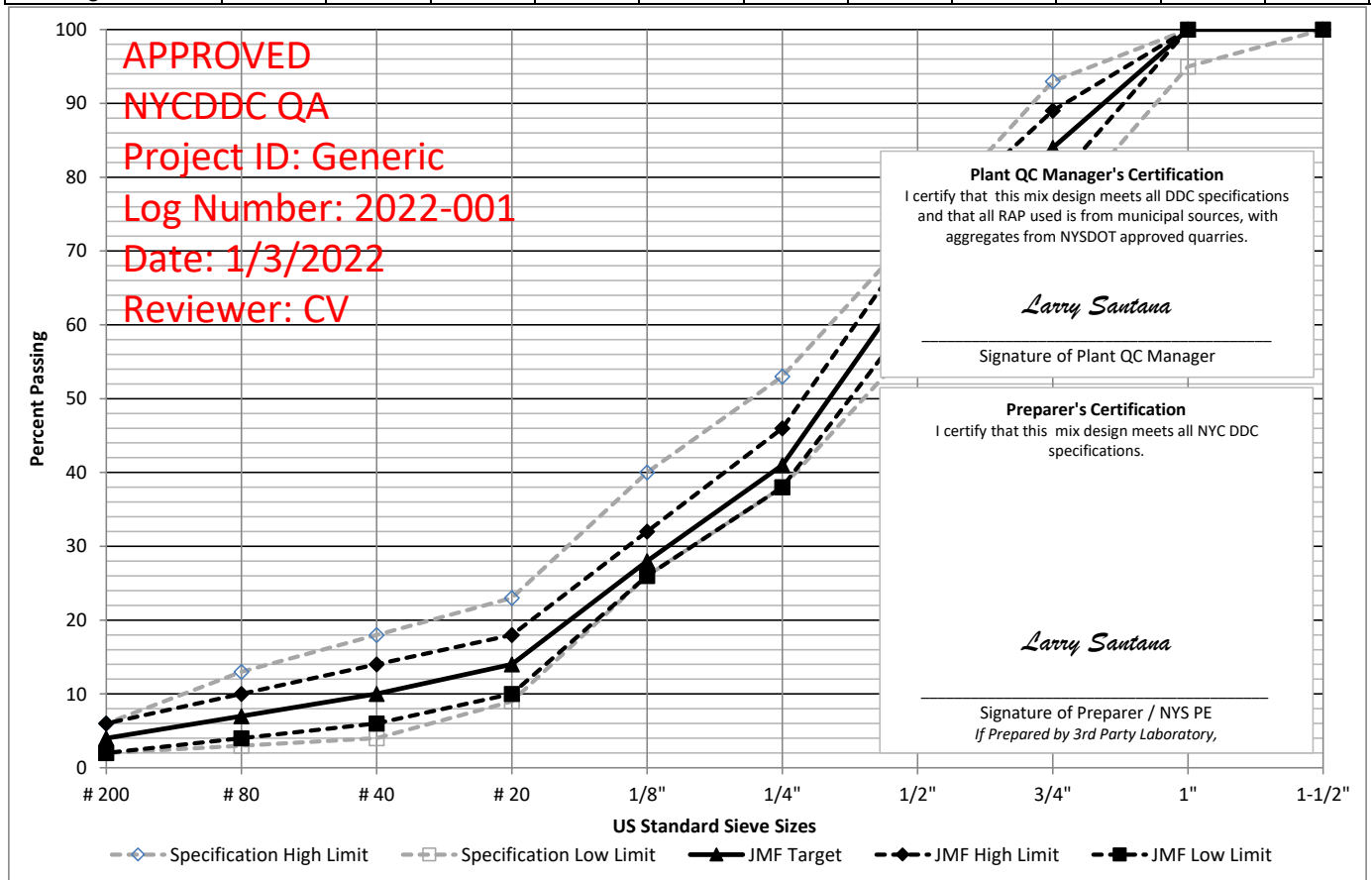
MIX DESIGN DATE: **12/28/2021**
 PREPARED BY: **LARRY SANTANA**
 COMPANY: **WILLETS POINT ASPHALT CORP**
 PLANT QC MGR: **LARRY SANTANA**

Item	Supplier / Quarry	NYSDOT Source	High Friction	Agg. Blend %	Mix %	Lbs / Ton	
					0.0%	0	
#57 Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	43.0%	41.8%	837	
#8 Stone	Tilcon, Mt Hope,NJ	8-32R	Yes	13.0%	12.6%	253	
					0.0%	0	
Manuf. Sand	Tilcon, Mt Hope,NJ	8-32R	N/A	0.0%	0.0%	0	
Manuf. Sand	Tilcon, Mt Hope,NJ	8-32R	N/A	14.0%	13.6%	272	
RAP 1	Willets Pt. Asphalt Corp.	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 _b):	1.034		2.7%	54	
Total Asphalt Content (P _b):					4.5%	90	
					100.0%	2,000	

QA&CS APPROVAL STAMP

WilletsPointAsphalt/3RA/Binder/Generic/NYCDDC/001/22 Expires: 1/31/2024
 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	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	67	41	28	14	10	7	4	4.5
JMF Range	100-100	100-100	79-89	62-72	38-46	26-32	10-18	6-14	4-10	2-6	4-5.2



QA & CONSTRUCTION SAFETY BUREAU
AGGREGATE SPECIFIC GRAVITY & COMBINED GRADATION WORKSHEET - 3 RA BINDER MIX

PLANT NAME: WILLETS POINT ASPHALT CORP

NYS DOT FACILITY #: H0354

MIX DESIGN DATE: 12/28/2021

Average Bin Gradations

Sieve	Not Used		#57 Stone		#8 Stone		Not Used		Manuf. 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	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0
1"	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0
3/4"	100.0	36.2	63.8	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0
1/2"	100.0	40.0	23.8	2.1	97.9	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0
1/4"	100.0	21.5	2.3	66.5	31.4	0.0	100.0	0.0	100.0	0.0	100.0	0.0	28.2	71.8	0.0	100.0
1/8"	100.0	2.3	0.0	27.5	3.9	0.0	100.0	0.0	100.0	11.1	88.9	22.2	49.6	0.0	100.0	0.0
#20	100.0	0.0	0.0	3.9	0.0	0.0	100.0	0.0	100.0	45.5	43.4	25.0	24.6	0.0	100.0	0.0
#40	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	13.5	29.9	4.8	19.8	0.0	100.0	0.0
#80	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	13.0	16.9	3.2	16.6	0.0	100.0	0.0
#200	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	12.0	4.9	5.2	11.4	0.0	100.0	0.0
Pan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	11.4	0.0	0.0	0.0	0.0	0.0
Totals	0.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0

Stockpiles Sampled By: **D. JANIK** Date Sampled: **12/20/2021**

Gradation Technician: **D. JANIK** Date Tested: **12/20/2021**

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	#57 Stone	#8 Stone	Not Used	Manuf. Sand	Manuf. Sand	RAP 1	Not Used
% Coarse Agg.	---	97.7%	68.6%	---	0.0%	0.0%	28.2%	---
Test Required?	NO	YES	YES	NO	NO	NO	YES	NO
A) Wt. in Air		2644.0	2636.8				1020.0	
B) Wt. SSD		2660.1	2658.0				1027.0	
C) Wt. in Water		1680.9	1674.0				641.5	
G _{sb} (A)/(B-C)	---	2.700	2.680	---	---	---	2.646	---
G _{sa} (A)/(A-C)	---	2.745	2.739	---	---	---	2.695	---

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	Manuf. Sand	Manuf. Sand	RAP 1	Not Used
% Fine Agg.	---	2.3%	31.4%	---	100.0%	100.0%	71.8%	---
Test Required?	NO	NO	YES	NO	YES	YES	YES	NO
A) Wt. in Air		0.0	2636.8		495.1	495.1	1020.0	
B) Wt. Flask + Water		0.0	0.0		681.0	681.0	0.0	
C) Wt. Flask + Water + Sample		0.0	1674.0		992.2	992.2	641.5	
S) Wt. SSD		0.0	2658.0		497.6	497.6	1027.0	
G _{sb} (A)/(B+S-C)	---	---	2.680	---	2.656	2.656	2.646	---
G _{sa} (A)/(B+A-C)	---	---	2.739	---	2.692	2.692	2.695	---

Combined Aggregate Specific Gravity

	Not Used	#57 Stone	#8 Stone	Not Used	Manuf. Sand	Manuf. Sand	RAP 1	Not Used
Combined G _{sb}	---	2.700	2.680	---	2.656	2.656	2.646	---
Combined G _{sa}	---	2.745	2.739	---	2.692	2.692	2.695	---

S. G. Technician: **D. JANIK** Date Tested: **12/20/2021**

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
#57 Stone	43.0%	43.0	43.0	27.4	10.2	1.0	0.0	0.0	0.0	0.0	0.0
#8 Stone	13.0%	13.0	13.0	13.0	12.7	4.1	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
Manuf. 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	12.4	6.1	4.2	2.4	0.7
RAP 1	30.0%	30.0	30.0	30.0	30.0	21.5	14.9	7.4	5.9	5.0	3.4
Not Used	0.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0%	100.0	100.0	84.4	67.0	40.6	27.8	13.5	10.1	7.3	4.1
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: WILLETS POINT ASPHALT CORP

NYSDOT FACILITY #: H0354

MIX DESIGN DATE: 12/28/2021

BATCH 1
 Batch P_b: 3.5%
 Batch Grams: 1280.0

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
#57 Stone	43.0%	41.5%	531.1		0.0	0.0	192.3	212.5	114.2	12.2	0.0	0.0	0.0	0.0	0.0
#8 Stone	13.0%	12.5%	160.6		0.0	0.0	0.0	3.4	106.8	44.2	6.3	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
Manuf. 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
Manuf. Sand	14.0%	13.5%	172.9		0.0	0.0	0.0	0.0	0.0	19.2	78.7	23.3	22.5	20.8	8.5
RAP 1	30.0%	30.9%	395.1	24.5	0.0	0.0	0.0	0.0	111.4	87.7	98.8	19.0	12.6	20.5	20.5
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
Virgin Asphalt		1.6%	20.3	20.3											
Total Mix	100.0%	100.0%	1280.0	44.8	0.0	0.0	192.3	215.8	332.4	163.3	183.7	42.3	35.1	41.3	29.0

3.50%

BATCH 2
 Batch P_b: 4.0%
 Batch Grams: 1280.0

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
#57 Stone	43.0%	41.3%	528.4		0.0	0.0	191.3	211.4	113.6	12.2	0.0	0.0	0.0	0.0	0.0
#8 Stone	13.0%	12.5%	159.7		0.0	0.0	0.0	3.4	106.2	43.9	6.2	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
Manuf. 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
Manuf. Sand	14.0%	13.4%	172.0		0.0	0.0	0.0	0.0	0.0	19.1	78.3	23.2	22.4	20.6	8.4
RAP 1	30.0%	30.7%	393.0	24.4	0.0	0.0	0.0	0.0	110.8	87.2	98.3	18.9	12.6	20.4	20.4
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
Virgin Asphalt		2.1%	26.8	26.8											
Total Mix	100.0%	100.0%	1280.0	51.2	0.0	0.0	191.3	214.7	330.7	162.4	182.8	42.1	34.9	41.1	28.9

4.00%

BATCH 3
 Batch P_b: 4.5%
 Batch Grams: 1280.0

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
#57 Stone	43.0%	41.1%	525.6		0.0	0.0	190.3	210.3	113.0	12.1	0.0	0.0	0.0	0.0	0.0
#8 Stone	13.0%	12.4%	158.9		0.0	0.0	0.0	3.3	105.7	43.7	6.2	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
Manuf. 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
Manuf. Sand	14.0%	13.4%	171.1		0.0	0.0	0.0	0.0	0.0	19.0	77.9	23.1	22.2	20.5	8.4
RAP 1	30.0%	30.5%	391.0	24.2	0.0	0.0	0.0	0.0	110.3	86.8	97.7	18.8	12.5	20.3	20.3
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
Virgin Asphalt		2.6%	33.4	33.4											
Total Mix	100.0%	100.0%	1280.0	57.6	0.0	0.0	190.3	213.6	328.9	161.6	181.8	41.9	34.8	40.9	28.7

4.50%

BATCH 4
 Batch P_b: 5.0%
 Batch Grams: 1280.0

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
#57 Stone	43.0%	40.9%	522.9		0.0	0.0	189.3	209.2	112.4	12.0	0.0	0.0	0.0	0.0	0.0
#8 Stone	13.0%	12.4%	158.1		0.0	0.0	0.0	3.3	105.1	43.5	6.2	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
Manuf. 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
Manuf. Sand	14.0%	13.3%	170.2		0.0	0.0	0.0	0.0	0.0	18.9	77.5	23.0	22.1	20.4	8.3
RAP 1	30.0%	30.4%	388.9	24.1	0.0	0.0	0.0	0.0	109.7	86.3	97.2	18.7	12.4	20.2	20.2
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
Virgin Asphalt		3.1%	39.9	39.9											
Total Mix	100.0%	100.0%	1280.0	64.0	0.0	0.0	189.3	212.5	327.2	160.7	180.9	41.7	34.6	40.7	28.6

5.00%

BATCH 5
 Batch P_b: 5.5%
 Batch Grams: 1280.0

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
#57 Stone	43.0%	40.6%	520.1		0.0	0.0	188.3	208.1	111.8	12.0	0.0	0.0	0.0	0.0	0.0
#8 Stone	13.0%	12.3%	157.2		0.0	0.0	0.0	3.3	104.6	43.2	6.1	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
Manuf. 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
Manuf. Sand	14.0%	13.2%	169.3		0.0	0.0	0.0	0.0	0.0	18.8	77.1	22.9	22.0	20.3	8.3
RAP 1	30.0%	30.2%	386.9	24.0	0.0	0.0	0.0	0.0	109.1	85.9	96.7	18.6	12.4	20.1	20.1
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
Virgin Asphalt		3.6%	46.4	46.4											
Total Mix	100.0%	100.0%	1280.0	70.4	0.0	0.0	188.3	211.4	325.5	159.9	179.9	41.4	34.4	40.4	28.4

5.50%

QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: WILLETS POINT ASPHALT CORP

NYSDOT FACILITY #: HO354

MIX DESIGN DATE: 12/28/2021

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)	2220.2	2210.0	2204.0	2210.3	2250.2	2244.0	2215.3	2213.5	2160.0	2159.2
B) Pycnometer in Water (Grams)	1285.2	1293.4	1285.2	1293.4	1285.2	1293.4	1285.2	1293.1	1285.2	1293.1
C) Sample & Pycnometer in Water (Grams)	2641.5	2642.8	2621.5	2636.6	2644.2	2646.9	2617.2	2625.4	2581.2	2589.7
$G_{mm} (A/(A+B-C))$	2.570	2.568	2.540	2.549	2.525	2.520	2.508	2.512	2.500	2.503
Average G_{mm}	2.569		2.545		2.522		2.510		2.502	

Density Technician: D. JANIK

Date Tested: 12/20/2021

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	1235.5	1237.1	721.5	515.6	2.396	2.569	6.7%	2515	1	2515	9.5	265
Specimen B	1239.5	1241.5	723.0	518.5	2.391	2.569	6.9%	2600	1	2600	9.0	289
Specimen C	1236.1	1237.5	722.5	515.0	2.400	2.569	6.6%	2550	1	2550	10.0	255
Average					2.396	2.569	6.7%	149.5		2560	9.5	270

TRIAL BATCH 2

$P_b = 4.0\%$

Specimen A	1233.3	1235.0	721.5	513.5	2.402	2.545	5.6%	2565	1	2565	10.5	244
Specimen B	1236.2	1237.1	722.9	514.2	2.404	2.545	5.5%	2515	1	2515	9.5	265
Specimen C	1235.5	1237.0	722.2	514.8	2.400	2.545	5.7%	2555	1	2555	10.5	243
Average					2.402	2.545	5.6%	149.9		2545	10.2	251

TRIAL BATCH 3

$P_b = 4.5\%$

Specimen A	1237.4	1239.0	726.5	512.5	2.414	2.522	4.3%	2755	1	2755	11.0	250
Specimen B	1237.0	1238.8	727.3	511.5	2.418	2.522	4.1%	2805	1	2805	11.0	255
Specimen C	1238.0	1240.1	727.5	512.6	2.415	2.522	4.2%	2885	1	2885	10.5	275
Average					2.416	2.522	4.2%	150.8		2815	10.8	260

TRIAL BATCH 4

$P_b = 5.0\%$

Specimen A	1242.2	1243.2	731.5	511.7	2.428	2.510	3.3%	2810	1	2810	11.0	255
Specimen B	1244.0	1245.0	734.2	510.8	2.435	2.510	3.0%	2890	1	2890	11.5	251
Specimen C	1245.1	1246.3	734.0	512.3	2.430	2.510	3.2%	2845	1	2845	11.5	247
Average					2.431	2.510	3.2%	151.7		2848	11.3	251

TRIAL BATCH 5

$P_b = 5.5\%$

Specimen A	1244.4	1245.9	736.8	509.1	2.444	2.502	2.3%	2800	1	2800	10.5	267
Specimen B	1242.9	1243.5	734.5	509.0	2.442	2.502	2.4%	2790	1	2790	11.5	243
Specimen C	1246.0	1247.2	737.0	510.2	2.442	2.502	2.4%	2910	1	2910	12.5	233
Average					2.443	2.502	2.4%	152.4		2832	11.5	247

Marshall Technician: D. JANIK

Date Tested: 12/20/2021

QA & CONSTRUCTION SAFETY BUREAU

MIX VOLUMETRIC PROPERTIES WORKSHEET - 3 RA BINDER MIX

PLANT:	WILLETS POINT ASPHALT	NYSDOT FACILITY #:	H0354	MIX DESIGN DATE:	12/28/2021
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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%
43.0%	#57 Stone	8-32R	2.745	2.700	41.5%	41.3%	41.1%	40.9%	40.6%
13.0%	#8 Stone	8-32R	2.739	2.680	12.5%	12.5%	12.4%	12.4%	12.3%
0.0%	Not Used	---	---	---	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	Manuf. Sand	8-32R	2.692	2.656	0.0%	0.0%	0.0%	0.0%	0.0%
14.0%	Manuf. Sand	8-32R	2.692	2.656	13.5%	13.4%	13.4%	13.3%	13.2%
30.0%	RAP 1		2.695	2.646	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 _b	Percent Total Asphalt Binder, %			3.5%	4.0%	4.5%	5.0%	5.5%
P _{ba}	Percent Absorbed Asphalt Binder, %			0.43%	0.46%	0.39%	0.51%	0.69%
P _{be}	Percent Effective Asphalt Binder, %			3.09%	3.56%	4.13%	4.51%	4.84%
DP	Dust Proportion			0.8	0.9	1.0	1.1	1.2
G _{mm}	Mix Maximum Specific Gravity			2.563	2.545	2.522	2.510	2.502
G _{mb}	Mix Bulk Specific Gravity			2.396	2.402	2.416	2.431	2.443
G _{sb}	Aggregate Bulk Gravity			2.678	2.678	2.678	2.678	2.678
G _{se}	Aggregate Effective Gravity			2.708	2.710	2.705	2.714	2.727
G _{sa}	Aggregate Apparent Specific Gravity			2.722	2.722	2.722	2.722	2.722

Mix Acceptance Properties		Low Limit	High Limit	Trial Batch				
				1	2	3	4	5
VMA	Voids in Mineral Aggregate, %	13.5%		13.6%	13.8%	13.7%	13.7%	13.7%
<i>Note: All five trial batches must meet the minimum VMA requirement.</i>								
VFA	Voids Filled with Asphalt, %	65%	75%	50.4%	59.3%	69.4%	76.9%	82.7%
P _a	Percent Air Voids, %	3.0%	5.0%	6.7%	5.6%	4.2%	3.2%	2.4%
---	Marshall Stability (Corrected), lb	1500		2560	2545	2815	2848	2832
---	Marshall Flow, 0.01"	8	12	9.5	10.2	10.8	11.3	11.5
---	Marshall Quotient, lb/0.01"	150		270	251	260	251	247

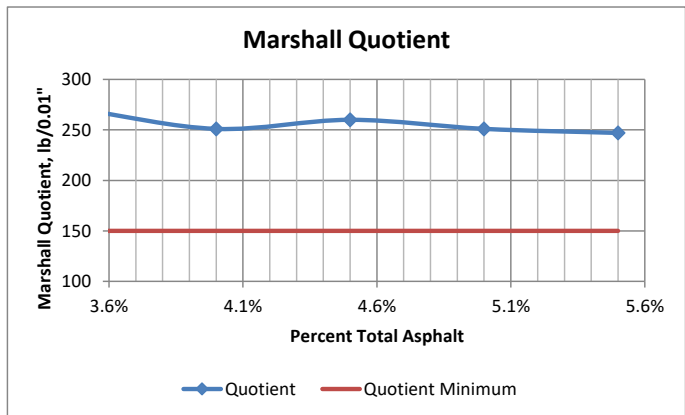
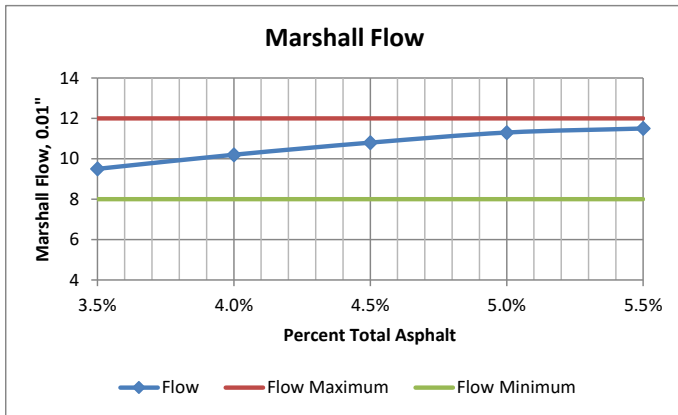
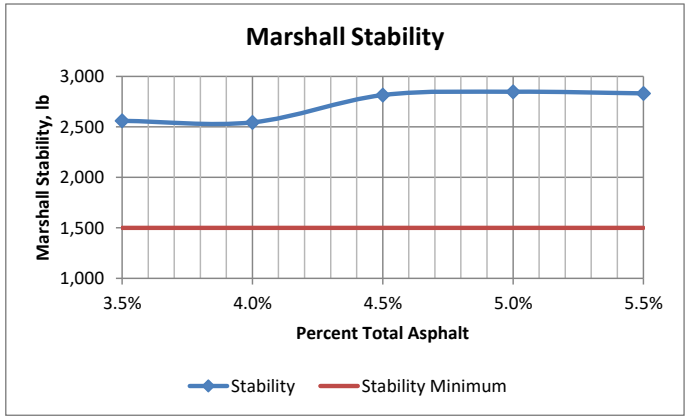
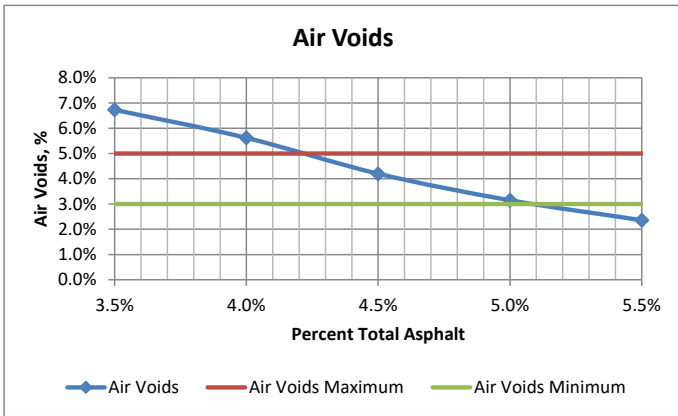
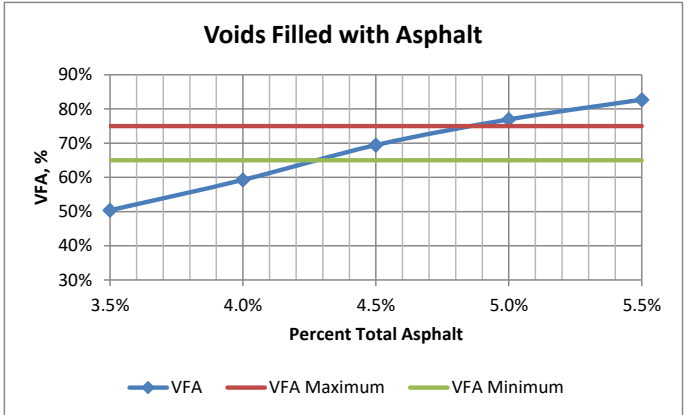
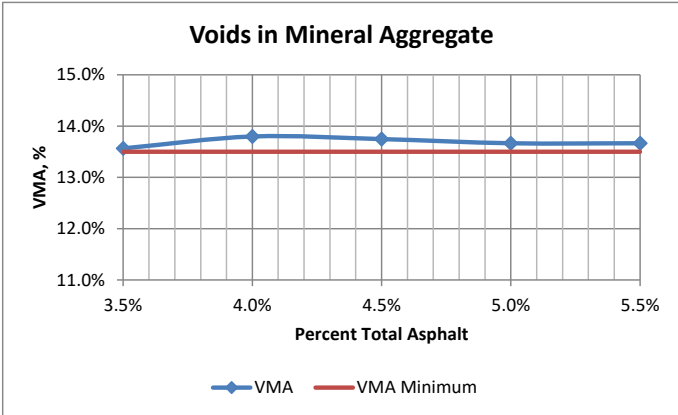
QA & CONSTRUCTION SAFETY BUREAU

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

PLANT NAME: WILLETS POINT ASPHALT CORP

NYSDOT FACILITY #: H0354

MIX DESIGN DATE: 12/28/2021



Property	Low	High
Voids in Mineral Aggregate (VMA), %	3.5%	5.5%
Voids Filled with Asphalt (VFA), %	4.3%	4.7%
Percent Air Voids, %	4.2%	5.0%
Marshall Stability (Corrected), lb	3.5%	5.5%
Marshall Flow, 0.01"	3.5%	5.5%
Marshall Quotient, lb/0.01"	3.6%	5.6%
Overlap	4.3%	4.7%

Properties at Desired AC%
13.7%
70.7%
3.9%
2815
10.8
260

Midpoint: 4.5%

Desired Total Asphalt Content P₀: 4.6%

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.