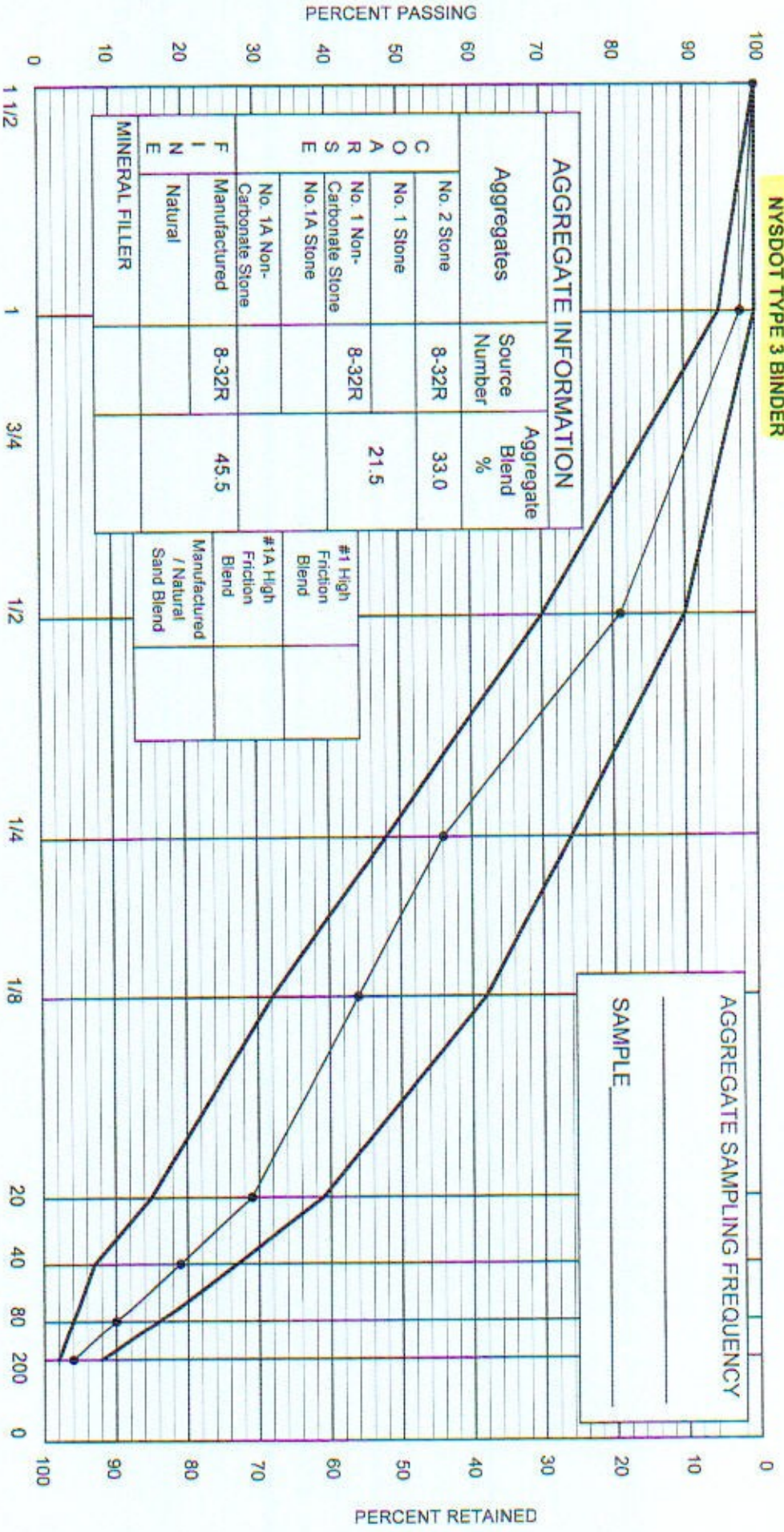


NEW YORK STATE  
DEPARTMENT OF TRANSPORTATION  
MATERIALS BUREAU  
JOB MIX FORMULA

Facility No. \_\_\_\_\_ Formula No. \_\_\_\_\_  
Plant \_\_\_\_\_ **Willets Point Asphalt** Region **11**  
Plant Location **Flushing, NY**  
Submitted \_\_\_\_\_ **Willets Point Asphalt**  
Date **4/1/11**

**NYS DOT TYPE 3 BINDER**



Sieve Size	1 1/2"	1"	3/4"	1/2"	1/4"	1/8"	No. 20	No. 40	No. 80	No. 200	Asphalt Content (Percent)	Asphalt Grade
1. General Limits	100	95-100	-	70-90	48-74	32-62	15-39	8-27	4-16	2-8	4.5-6.5	AC 20
2. JMF Range	100	95-100	-	75-87	49-63	37-51	22-36	12-26	6-14	2-6	-	PG 64-22
3. Target Value	100	98	-	81	56	44	29	19	10	4	4.5	

Recommended for Approval by Regional Director \_\_\_\_\_ Date: \_\_\_\_\_  
Approved by Director, Materials Bureau \_\_\_\_\_ Date: \_\_\_\_\_  
Remarks: \_\_\_\_\_

NEW YORK STATE  
DEPARTMENT OF TRANSPORTATION  
MATERIALS BUREAU  
MARSHALL GRADATION ANALYSIS WORKSHEET

REGION 11  
ITEM \_\_\_\_\_  
MIX TYPE TYPE 3 BINDER  
PRODUCER Williets Point Asphalt  
LOCATION Flushing, NY

NO. OF COMPOSITE/STOCKPILES AVERAGED 10

AVERAGE BIN BREAKDOWN

AGGREGATE INFORMATION		
AGGREGATES	SOURCE NUMBER	AGGREGATE BLEND %
No. 2 Stone	8-32R	33.0
No. 1 Stone		
No. 1 Non-Carbonate Stone	8-32R	21.5
No. 1A Stone		
No. 1A Non-Carbonate Stone		
Manufactured	8-32R	45.5
Natural		
R.A.P.		
MINERAL FILLER		

Sieve Size	BIN NO. 5		BIN NO. 4		BIN NO. 3		BIN NO. 2		BIN Sand		MF	
	ret.	pass	ret.	pass.	ret.	pass.	ret.	pass.	ret.	pass.	ret.	pass.
1 1/2"	0.0	100.0										
1"	2.5	97.5										
3/4"												
1/2"	16.5	81.0										
1/4"	25.0	56.0										
1/8"	12.0	44.0										
20	15.0	29.0										
40	10.0	19.0										
80	9.0	10.0										
200	6.0	4.0										
PAN	4.0		100.0		100.0		100.0		100.0		100.0	
Totals			100.0		100.0		100.0		100.0		100.0	

COMBINED AVERAGE GRADATION

BIN	Batched	% PASSING SIEVE									
		1 1/2"	1"	3/4"	1/2"	1/4"	1/8"	20	40	80	200
Composite	100.0	100.0	97.5	-	81.0	56.0	44.0	29.0	19.0	10.0	4.0
TOTAL	100.0	100.0	97.5	-	81.0	56.0	44.0	29.0	19.0	10.0	4.0
Specification Limits		100	95-100	-	70-90	48-74	32-62	15-39	8-27	4-16	2-8

REMARKS

TESTED BY Williets Point Asphalt ON 4/1/11

**AT THE % ASPHALT CEMENT INDICATED**

A.C.	% AGGREGATE COMPONENT	BATCH	BATCH	%	GRAMS	WEIGHT RETAINED (GRAMS)										Total WGT. RET.						
						1	3/4	1/2	1/4	1/8	20	40	80	200	Pan							
4.4	AGGREGATE COMPONENT	BATCH	BATCH	%	GRAMS	100.0	52.8	1.3	0.0	8.7	13.2	6.3	7.9	5.3	4.8	1.3	4.0	52.8				
						5	1	3/4	1/2	1/4	1/8	20	40	80	200	Pan						
						4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
						3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
						2	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
						Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
						(Specimen wtg) = 1200 (Specimen wtg) = 1200 x 4.4 %A.C. = 52.8 gr. A.C. - 52.8 gr. A.C. = 1147.2 gr. Aggregate																
4.8	AGGREGATE COMPONENT	BATCH	BATCH	%	GRAMS	100.0	1142.4	28.6	0.0	188.5	285.6	137.1	171.4	114.2	102.8	28.6	85.6	1142.4				
						5	1	3/4	1/2	1/4	1/8	20	40	80	200	Pan						
						4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
						3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
						2	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
						Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
						(Specimen wtg) = 1200 (Specimen wtg) = 1200 x 4.8 %A.C. = 57.6 gr. A.C. - 57.6 gr. A.C. = 1142.4 gr. Aggregate																
5.2	AGGREGATE COMPONENT	BATCH	BATCH	%	GRAMS	100.0	1137.6	28.4	0.0	187.7	284.4	136.5	170.6	113.8	102.4	28.4	85.4	1137.6				
						5	1	3/4	1/2	1/4	1/8	20	40	80	200	Pan						
						4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
						3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
						2	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
						Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
						(Specimen wtg) = 1200 (Specimen wtg) = 1200 x 5.2 %A.C. = 62.4 gr. A.C. - 62.4 gr. A.C. = 1137.6 gr. Aggregate																
5.6	AGGREGATE COMPONENT	BATCH	BATCH	%	GRAMS	100.0	1132.8	28.3	0.0	186.9	283.2	135.9	169.9	113.3	102.0	28.3	85.0	1132.8				
						5	1	3/4	1/2	1/4	1/8	20	40	80	200	Pan						
						4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
						3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
						2	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
						Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
						(Specimen wtg) = 1200 (Specimen wtg) = 1200 x 5.6 %A.C. = 67.2 gr. A.C. - 67.2 gr. A.C. = 1132.8 gr. Aggregate																
5.0	AGGREGATE COMPONENT	BATCH	BATCH	%	GRAMS	100.0	1128.0	28.2	0.0	186.1	282.0	135.4	169.2	112.8	101.5	28.2	84.6	1128.0				
						5	1	3/4	1/2	1/4	1/8	20	40	80	200	Pan						
						4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
						3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
						2	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
						Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
						(Specimen wtg) = 1200 (Specimen wtg) = 1200 x 6.0 %A.C. = 72.0 gr. A.C. - 72.0 gr. A.C. = 1128.0 gr. Aggregate																

Specimen	Asphalt Content	Weight - Grams			S.S.D.	Volume CC	Bulk Specific Gravity Gmb	Unit Wt lb/cu. Ft.	Measured	Stability - Lbs.		Flow 0.01 in	Marshall Quotient lb/0.01 in.
		In Air	In Water	d						e	Correction Factor		
a	b	c	d	e	f	g	h	i	j	k	l	m	kl
A		1200.7	700.3	1202.1	501.8	2.393		2215	1.04	2304	6.0		
B		1205.1	703.2	1206.7	503.5	2.393		2206	1.04	2294	6.0		
C		1199.6	699.3	1201.3	502.0	2.390		2130	1.04	2215	6.0		
AVG.	3.5					2.392	149.3			2271	6.0		379
A		1200.8	704.4	1203.2	498.8	2.407		2550	1.04	2652	10.0		
B		1197.6	702.2	1200.1	497.9	2.405		2550	1.04	2652	8.0		
C		1201.9	704.2	1204.6	500.4	2.402		2464	1.04	2563	8.0		
AVG.	4.0					2.405	150.1			2622	8.7		301
A		1198.2	705.3	1201.6	496.3	2.414		2416	1.04	2513	12.0		
B		1199.7	706.8	1203.2	496.4	2.417		2388	1.04	2484	12.0		
C		1198.8	705.7	1200.1	494.4	2.421		2552	1.09	2782	12.0		
AVG.	4.5					2.417	150.8			2593	12.0		216
A		1200.7	708.2	1203.1	494.9	2.426		2469	1.09	2691	12.0		
B		1193.0	704.7	1194.1	489.4	2.438		2425	1.09	2643	15.0		
C		1199.5	708.0	1200.8	492.8	2.434		2361	1.09	2573	15.0		
AVG.	5.0					2.433	151.8			2636	14.0		188
A		1206.8	709.2	1207.1	497.9	2.424		2445	1.04	2543	17.0		
B		1203.4	707.5	1203.7	496.2	2.425		2435	1.04	2533	16.0		
C		1204.0	709.3	1204.8	495.5	2.430		2387	1.09	2602	16.0		
AVG.	5.5					2.426	151.4			2559	16.3		157

PREPARED BY Willets Point Asphalt DATE 4/1/11

NEW YORK STATE  
DEPARTMENT OF TRANSPORTATION  
MATERIALS BUREAU

MIX TYPE TYPE 3 REGION 11  
PRODUCER Williets Point Asphalt  
LOCATION Flushing, NY

MAXIMUM SPECIFIC GRAVITY OF HOT MIX ASPHALT  
AASHTO T209

- Gmm = Maximum Specific Gravity of Hot Mix Asphalt  
 A = Weight of sample in air (grams)  
 D = Weight of pycnometer filled with airless water at 25 C (grams)  
 E = Weight of pycnometer filled with water and sample at 25 C (grams)  
 Gmm =  $\frac{A}{A+D-E}$

ASPHALT CONTENT	3.5 %		4.0 %		4.5 %		5.0 %		5.5 %	
	TEST NO.		TEST NO.		TEST NO.		TEST NO.		TEST NO.	
A	1 1203.1	2 1202.4	1 1204.6	2 1203.9	1 1205.9	2 1206.3	1 1207.4	2 1207.4	1 1208.6	2 1207.9
D	7391.6	7391.6	7391.6	7391.6	7391.6	7391.6	7391.6	7391.6	7391.6	7391.6
E	8122.5	8123.2	8120.1	8121.1	8118.4	8119.8	8115.3	8118.3	8111.7	8112.4
A+D-E	472.2	470.8	476.1	474.4	479.1	478.1	483.7	480.7	488.5	487.1
Gmm	2.548	2.554	2.530	2.538	2.517	2.523	2.496	2.512	2.474	2.480
Average Gmm	2.551		2.534		2.520		2.504		2.477	

TESTED BY Williets Point Asphalt ON 4/1/11

NEW YORK STATE  
DEPARTMENT OF TRANSPORTATION  
MATERIALS BUREAU

WORKSHEET FOR ANALYSIS OF  
COMPACTED PAVING MIXTURE

(Analysis by weight of total mixture)  
COMPOSITION OF PAVING MIXTURE

ITEM	REGION	11
MIX TYPE	TYPE 3 BINDER	
PRODUCER	Willits Point Asphalt	
LOCATION	Flushing, NY	
COMPACTION	75 BLOWS PER SIDE	

CONSTITUENT MATERIAL	NYS DOT	Specific Gravity	Source		Number	Region	Mix Composition, % by weight of Total Mix, P				
			Apparent	Bulk			1	2	3	4	5
CA	No. 2 Stone	8-32R	2.697	2.659	P1		31.85	31.68	31.52	31.35	31.19
	No. 1 Stone	8-32R	2.697	2.659	P2						
	No. 1 Non-Carbonate Stone	8-32R	2.697	2.659	P3		20.75	20.64	20.53	20.43	20.32
	No. 1A Stone				P4						
	No. 1A Non-Carbonate Stone				P5						
	Man. Sand	8-32R	2.691	2.650	P6		43.91	43.68	43.45	43.23	43.00
	Natural Sand				P7						
	R.A.P.				P8						
	MINERAL FILLER				P9						
TOTAL AGGREGATE				Ps		96.5	96.0	95.5	95.0	94.5	
ASPHALT CEMENT @ 25 C		1.027		PB		3.5	4.0	4.5	5.0	5.5	
Gmm	Max Sp. Gr. of Paving Mix (AASHTO T209)					2.551	2.534	2.520	2.504	2.477	
Gmb	Bulk Sp. Gr. of compacted mix (AASHTO T166)					2.392	2.405	2.417	2.433	2.426	
Gsb	Bulk Sp. Gr. of total aggregate					2.655	2.655	2.655	2.655	2.655	
Gse	Effective Sp. Gr. of total aggregate					2.696	2.699	2.705	2.709	2.699	
Gsa	Apparent Sp. Gr. of total aggregate					2.694	2.694	2.694	2.694	2.694	
VMA	100 - (Gmb x Ps/Gsb)					13.06	13.04	13.06	12.94	13.65	
Pa	Pa = 100[(Gmm - Gmb)/Gmm]					6.23	5.09	4.09	2.84	2.06	
VFA	VFA = 100 [(VMA - Pa)/VMA]					52.30	60.97	68.58	78.05	84.91	
Pbe	Effective Asphalt Content = Gb(VMA - Pa)/Gmb					2.93	3.39	3.81	4.26	4.91	
Stability (CORRECTED)						2271	2622	2593	2636	2559	
Flow						6.0	8.7	12.0	14.0	16.3	
Marshall Quotient = Stability/corrected/Flow						379	301	216	188	157	
Unit Weight						149.3	150.1	150.8	151.8	151.4	

\* EQUATIONS FROM CHAPTER V, SECTION E, NY MATERIALS METHOD 5.13

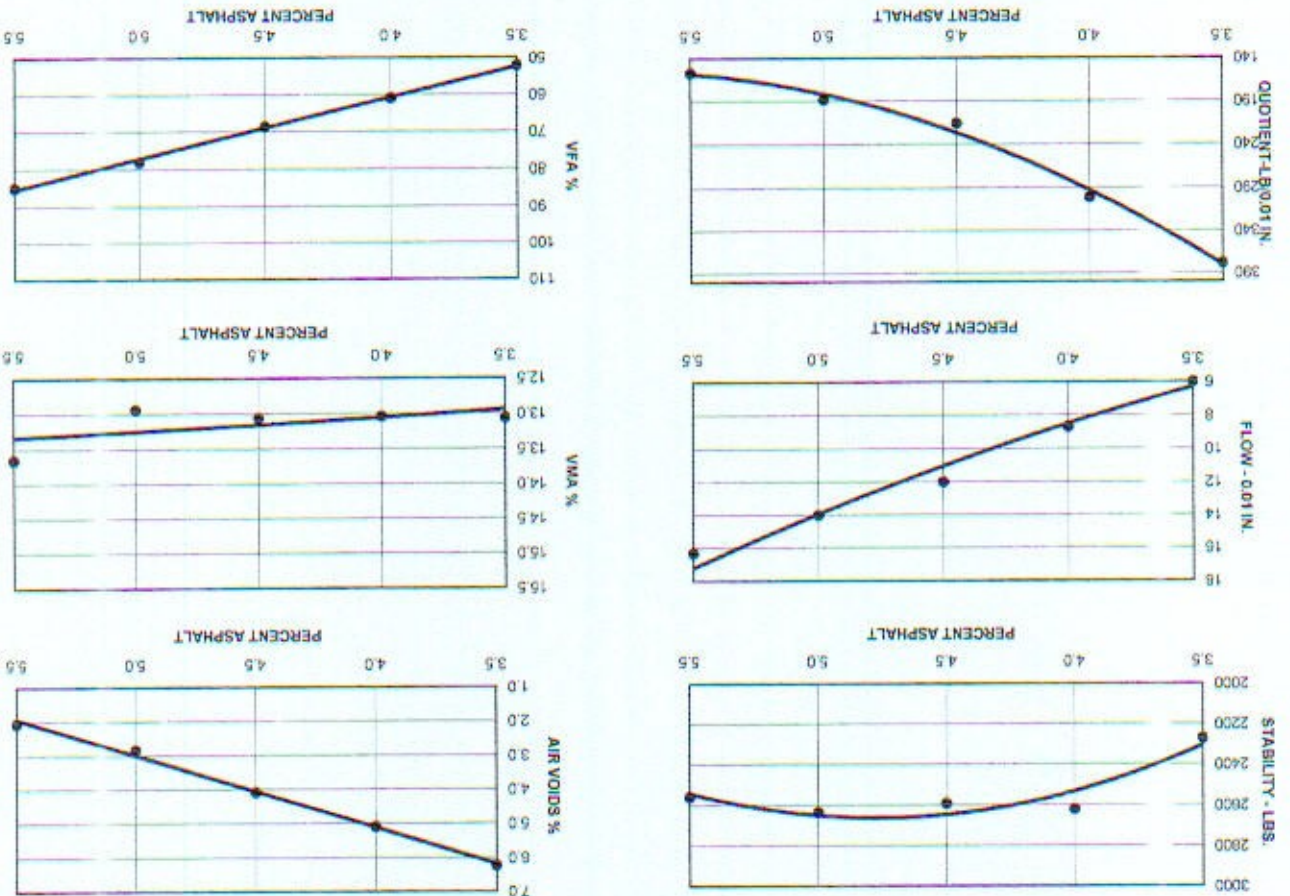
Prepared By

Willits Point Asphalt

On 4/1/11

ITEM REGION 11  
 MIX TYPE TYPE 3 BINDER  
 PRODUCER Willets Point Asphalt  
 LOCATION Flushing, NY

MARSHALL TEST PROPERTY CURVES AND RANGE DATA



VALUES AT OPTIMUM AC CONTENT

PROPERTY	STABILITY	FLOW	QUOTIENT	AIR VOIDS	VMA	VFA
SPECIFICATION	1500 min.	8.0 min	150 min	3.0-5.0	12.0 min.	65 - 75
ACTUAL	2650	10	216	4.0	13.7	70

COMMON OVERLAP RANGE 4.3-4.7  
 MID POINT 4.5  
 (OPTIMUM AC CONTENT) 4.5  
 SUBMITTED BY Willets Point Asphalt  
 DATE 4/1/11