

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: 6/15/20

Dates Test Represents: 6/16/2020 through 6/22/2020

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____



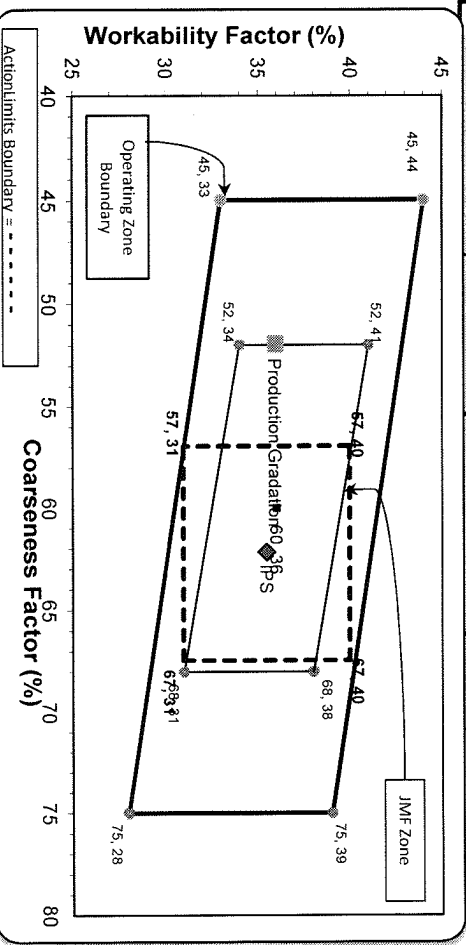
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1520	9.30	2.62	49.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
			Total Wt:	3050		100.0

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.1	100.0	100.0	99.1	0.9	0.9
3/4"	84.0	100.0	100.0	92.0	7.0	8.0
1/2"	51.7	96.3	100.0	75.6	16.5	24.4
3/8"	36.2	84.9	100.0	66.7	8.8	33.3
#4	7.9	28.0	97.0	45.8	20.9	54.2
#8	3.6	9.7	82.3	35.9	9.9	64.1
#16	2.7	5.4	65.8	28.4	7.5	71.6
#30	2.5	4.5	46.1	20.3	8.1	79.7
#50	2.3	3.9	21.1	10.0	10.2	90.0
#100	2.0	3.2	5.7	3.6	6.4	96.4
LBW	1.7	2.9	1.8	1.9	1.8	98.1

Production Gradation: Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **52** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	62	35	100.0	0.0	0.0
1.5"			100.0	0.0	0.0
1"			100.0	0.0	0.0
3/4"			94.0	6.0	6.0
1/2"			70.2	23.7	29.8
3/8"			59.9	10.4	40.1
#4			42.7	17.2	57.3
#8			35.5	7.2	64.5
#16			28.4	7.0	71.6
#30			19.2	9.2	80.8
#50			8.9	10.3	91.1
#100			3.1	5.9	96.9
LBW			1.4	1.7	98.6

*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom. 1.5") aggregate is used.

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 06/14/2020 - 06/20/2020

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.1	%	95-100
	3/4" (19mm)	84.0	%	
	1/2" (12.5mm)	51.7	%	30-60
	3/8" (9.5mm)	36.2	%	
	#4 (4.75mm)	7.9	%	0-8
	#8 (2.36mm)	3.6	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	3.3	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 06/14/2020 - 06/20/2020

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	26A Mod LS Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	100.0	%	100-100
	1/2" (12.5mm)	96.3	%	95-100
	3/8" (9.5mm)	84.9	%	60-95
	#4 (4.75mm)	28.0	%	5-30
	#8 (2.36mm)	9.7	%	0-12
	#16 (1.18mm)	5.4	%	
	#30 (.6mm)	4.5	%	
	#50 (.3mm)	3.9	%	
	#100 (.15mm)	3.2	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75µm)	2.7	%	0-3
	Total Moisture	3.2	%	

Plant 958-JMT
Product 1022-2NS GR - Smelter Bay
Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician
Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	82.3	%	65-95
	#16 (1.18mm)	65.8	%	35-75
	#30 (.6mm)	46.1	%	20-55
	#50 (.3mm)	21.1	%	10-30
	#100 (.15mm)	5.7	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	4.3	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

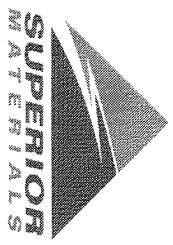
Sample Date: 6/15/20

Dates Test Represents: 6/16/2020 through 6/22/2020

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____



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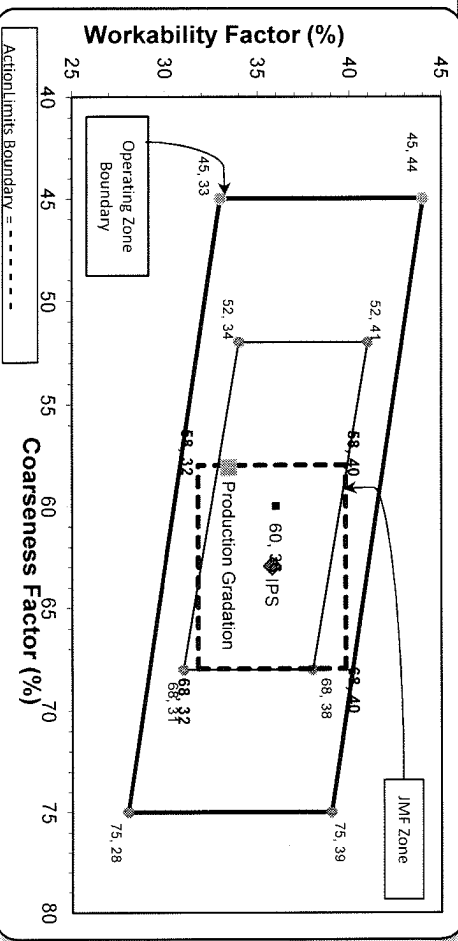
Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
GAA	71-47	Presque Isle	1700	10.40	2.62	55.7
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	44-051	Krake Willis Rd	1200	7.26	2.65	39.3
Total Wt			3050	18.57		100.0

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.9	100.0	100.0	99.4	0.6	0.6
3/4"	86.5	100.0	100.0	92.5	6.9	7.5
1/2"	52.1	97.5	100.0	73.2	19.3	26.8
3/8"	31.7	88.4	100.0	61.4	11.8	38.6
#4	5.6	26.2	96.4	42.3	19.0	57.7
#8	2.5	7.3	80.6	33.5	8.9	66.5
#16	2.0	3.4	65.2	26.9	6.5	73.1
#30	1.8	2.7	49.4	20.6	6.4	79.4
#50	1.7	2.4	22.9	10.1	10.5	89.9
#100	1.5	2.1	7.0	3.7	6.4	96.3
LBW	1.2	1.7	1.4	1.3	2.4	98.7

*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **58** Workability Factor: **33**



Initial Production Sample (IPS)

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.6	0.6
3/4"	6.9	7.5
1/2"	19.3	26.8
3/8"	38.6	57.7
#4	57.7	66.5
#8	66.5	73.1
#16	73.1	79.4
#30	79.4	89.9
#50	89.9	96.3
#100	96.3	98.7
LBW	98.7	98.8

Coarseness Factor: **63** Workability Factor: **36**

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 06/14/2020 - 06/20/2020

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.9	%	95-100
	3/4" (19mm)	86.5	%	
	1/2" (12.5mm)	52.1	%	30-60
	3/8" (9.5mm)	31.7	%	
	#4 (4.75mm)	5.6	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.15	%	
	Wash Loss (#200/75µm)	1.1	%	0-2
	Total Moisture	3.35	%	



Plant S39-Superior Sterling Heights

Product 1067-26A Mod LS

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	26A LS Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	100.0	%	100-100
	1/2" (12.5mm)	97.5	%	95-100
	3/8" (9.5mm)	88.4	%	60-95
	#4 (4.75mm)	26.2	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	3.4	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	1.99	%	



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	80.6	%	65-95
	#16 (1.18mm)	65.2	%	35-75
	#30 (.6mm)	49.4	%	20-55
	#50 (.3mm)	22.9	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.77	%	