

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P11

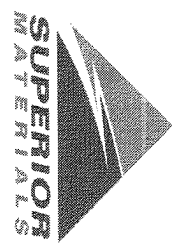
Sample Date: 5/13/24

Dates Test Represents: 5/14/2024 through 5/20/2024

Concrete Grade: S2M 3500HP

Contractor: _____

MDOT No.: _____



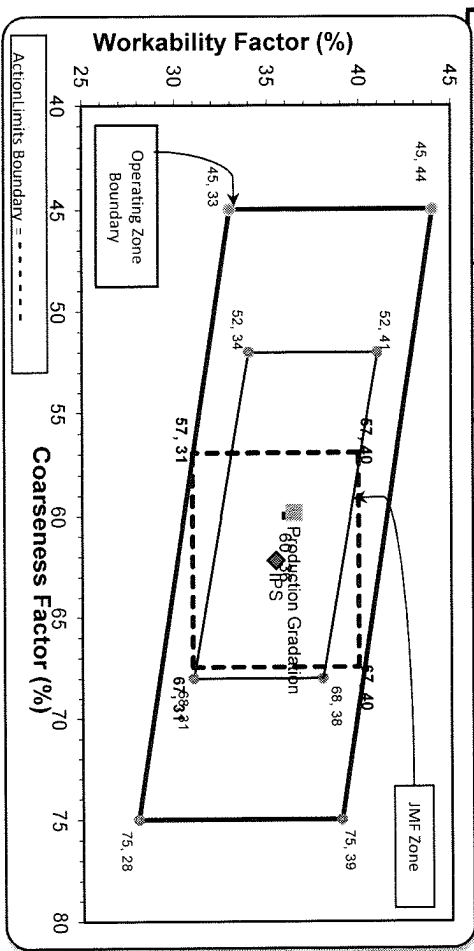
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1450	8.87	2.62	47.5
26A	71-47	Presque Isle	370	2.26	2.62	12.1
ZNS	95-013	Smeller Bay	1230	7.44	2.65	40.3
		Total Wt	3050	18.57		100.0

Sieve	6AA	26A	ZNS	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"	97.3	100.0	100.0	98.7	1.3	1.3
3/4"	83.1	100.0	100.0	92.0	6.8	8.0
1/2"	43.2	93.7	100.0	72.2	19.7	27.8
3/8"	24.5	82.5	100.0	62.0	10.2	38.0
#4	5.4	19.5	96.3	43.8	18.2	56.2
#8	3.3	5.0	85.0	36.5	7.3	63.5
#16	2.9	2.7	70.4	30.1	6.4	69.9
#30	2.7	2.0	50.5	21.9	8.2	78.1
#50	2.6	1.7	23.6	11.0	10.9	89.0
#100	2.4	1.5	6.9	4.1	6.9	95.9
LBW	2.0	1.3	1.3	1.6	2.5	98.4

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **60** Workability Factor: **36**



Initial Production Sample (IPS)

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

*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

PREPARED BY:
SM, LLC Technical Service

Approved By:



Plant S11-Onsite Jefferson

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.3	%	95-100
	3/4" (19mm)	83.1	%	
	1/2" (12.5mm)	43.2	%	30-60
	3/8" (9.5mm)	24.5	%	
	#4 (4.75mm)	5.4	%	0-8
	#8 (2.36mm)	3.3	%	
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.15	%	
	Wash Loss (#200/75um)	2.0	%	0-2
	Total Moisture	3.55	%	



Plant S11-Onsite Jefferson

Product 1067-26A Mod LS

Period: 05/12/2024 - 05/18/2024

Name/Title Doug Storey / QC Technician

Report Date 05/18/2024

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)	93.7	%	95-100
	3/8" (9.5mm)	82.5	%	60-95
	#4 (4.75mm)	19.5	%	5-30
	#8 (2.36mm)	5.0	%	0-12
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	2.63	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.3	%	95-100
	#8 (2.36mm)	85.0	%	65-95
	#16 (1.18mm)	70.4	%	35-75
	#30 (.6mm)	50.5	%	20-55
	#50 (.3mm)	23.6	%	10-30
	#100 (.15mm)	6.9	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	4.66	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-02**

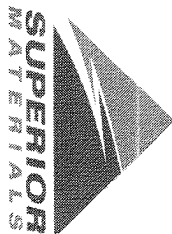
Contractor: _____

Sample Date: **5/13/24**

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: **5/14/2024** through **5/20/2024**

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	1550	9.48	2.62	50.8
26A	71-47	Presque Isle	270	1.65	2.62	8.9
2NS	63-115	Ray Rd	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"	95.3	100.0	100.0	97.6	2.4	2.4
3/4"	71.5	100.0	100.0	85.5	12.1	14.5
1/2"	32.2	93.3	100.0	65.0	20.6	35.0
3/8"	17.5	83.2	100.0	56.6	8.4	43.4
#4	4.7	17.9	96.0	42.7	13.9	57.3
#8	3.1	4.4	81.8	35.0	7.7	65.0
#16	2.8	2.6	67.6	28.9	6.0	71.1
#30	2.6	2.2	52.9	22.8	6.1	77.2
#50	2.5	2.0	28.4	12.9	9.9	87.1
#100	2.4	1.8	6.1	3.8	9.1	96.2
LBW	2.0	1.7	0.9	1.5	2.3	98.5

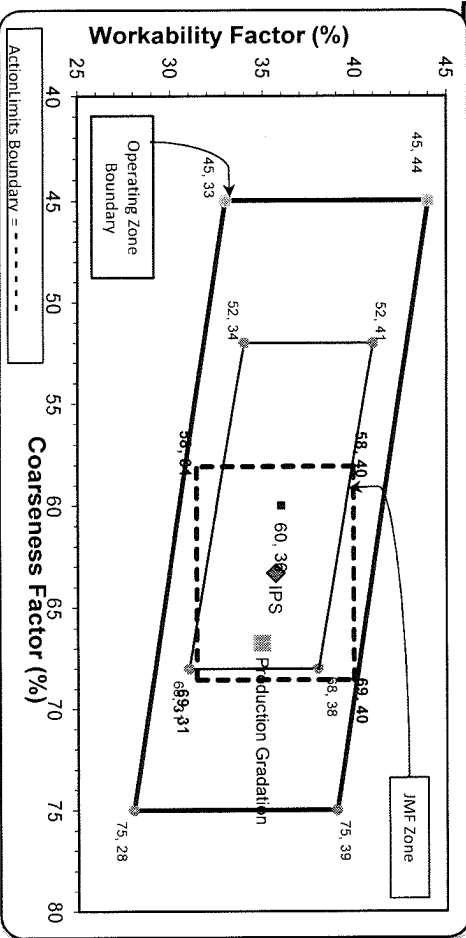
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **67** Workability Factor: **35**

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



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.6	4.4	4.4
1/2"	73.1	22.6	26.9
3/8"	59.3	13.8	40.7
#4	42.8	16.5	57.2
#8	35.7	7.1	64.3
#16	28.9	6.8	71.1
#30	20.7	8.2	79.3
#50	9.9	10.8	90.1
#100	2.1	7.8	97.9
LBW	0.9	1.2	99.1

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S02-Hoover

Product 1051-6AA LS

Period: 05/12/2024 - 05/18/2024

Name/Title Doug Storey / QC Technician

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	95.3	%	95-100
	3/4" (19mm)	71.5	%	
	1/2" (12.5mm)	32.2	%	30-60
	3/8" (9.5mm)	17.5	%	
	#4 (4.75mm)	4.7	%	0-8
	#8 (2.36mm)	3.1	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.14	%	
	Wash Loss (#200/75um)	2.0	%	0-2
	Total Moisture	2.74	%	



Plant S02-Hoover

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

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)	93.3	%	95-100
	3/8" (9.5mm)	83.2	%	60-95
	#4 (4.75mm)	17.9	%	5-30
	#8 (2.36mm)	4.4	%	0-12
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	1.83	%	



Plant S02-Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.0	%	95-100
	#8 (2.36mm)	81.8	%	65-95
	#16 (1.18mm)	67.6	%	35-75
	#30 (.6mm)	52.9	%	20-55
	#50 (.3mm)	28.4	%	10-30
	#100 (.15mm)	6.1	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	4.73	%	