

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **12**

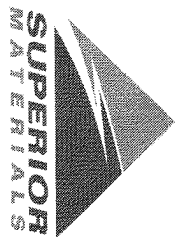
Sample Date: 6/19/23

Dates Test Represents: 6/20/2023 through 6/26/2023

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



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

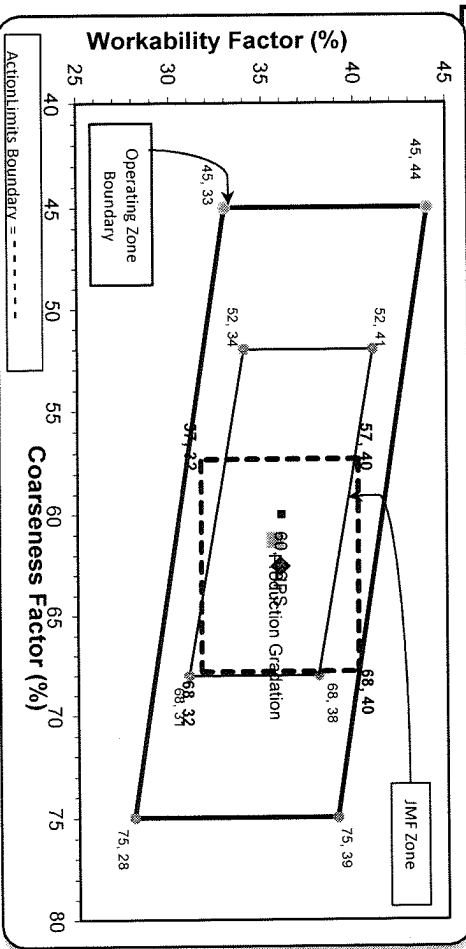
Agg. Class	Pit #	Source	Weight (ssb)	ft ³	Specific Gravity	Contribution %
GAA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
ZNS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.8	0.8
3/4"	7.7	8.6
1/2"	23.0	31.6
3/8"	9.4	40.9
#4	17.1	58.0
#8	8.8	66.8
#16	6.2	73.1
#30	6.2	79.3
#50	9.8	89.1
#100	7.9	96.9
LBW	1.9	98.9

*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.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **61** Workability Factor: **33** Adjusted WF: **35.7**



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.0	10.3	11.0
1/2"	70.3	18.7	29.7
3/8"	59.9	10.4	40.1
#4	41.9	18.0	58.1
#8	35.9	6.0	64.1
#16	27.8	8.2	72.2
#30	18.9	8.8	81.1
#50	6.3	12.6	93.7
#100	1.7	4.6	98.3
LBW	1.0	0.7	99.0

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S12-Onsite Southfield

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.3	%	95-100
	3/4" (19mm)	82.8	%	
	1/2" (12.5mm)	38.4	%	30-60
	3/8" (9.5mm)	21.7	%	
	#4 (4.75mm)	4.5	%	0-8
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.84	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.97	%	



Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Period: 06/18/2023 - 06/24/2023

Name/Title Doug Storey / QC Technician

Report Date 06/23/2023

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)	92.0	%	95-100
	3/8" (9.5mm)	82.3	%	60-95
	#4 (4.75mm)	14.8	%	5-30
	#8 (2.36mm)	3.7	%	0-12
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	1.87	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 06/18/2023 - 06/24/2023

Name/Title Doug Storey / QC Technician

Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.5	%	95-100
	#8 (2.36mm)	79.4	%	65-95
	#16 (1.18mm)	64.5	%	35-75
	#30 (.6mm)	49.0	%	20-55
	#50 (.3mm)	24.4	%	10-30
	#100 (.15mm)	4.7	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	2.77	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

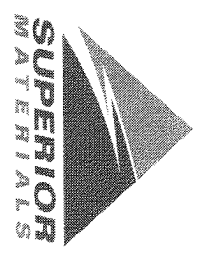
Sample Date: **6/19/23**

Dates Test Represents: **6/20/2023** through **6/26/2023**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



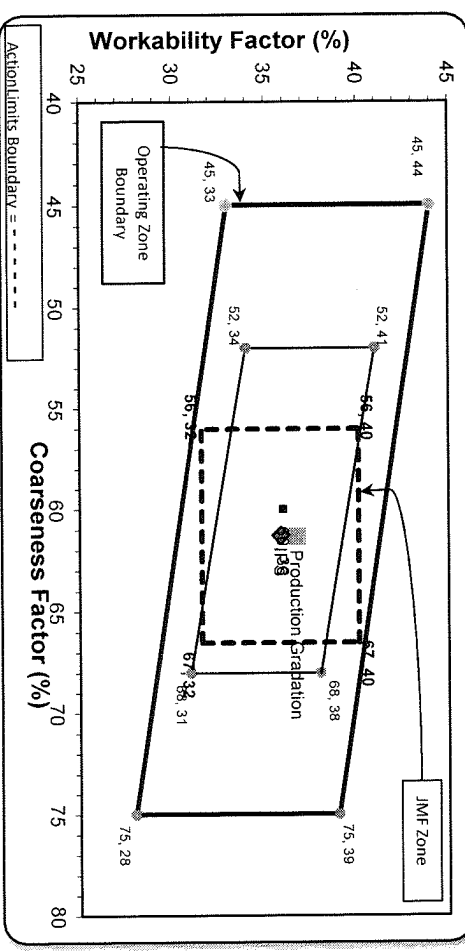
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stonoco	1500	8.94	2.69	50.8
26A	58-003	Stonoco	300	1.79	2.69	10.2
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
			Total Wt	2950		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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	90.0	100.0	100.0	94.9	5.1	5.1
1/2"	48.3	99.1	100.0	73.6	26.4	26.4
3/8"	22.2	92.3	100.0	59.7	40.3	40.3
#4	2.5	18.6	99.2	41.8	58.2	58.2
#8	1.0	6.5	84.8	34.2	65.8	65.8
#16	0.8	4.1	66.8	26.9	73.1	73.1
#30	0.8	3.5	48.2	19.6	80.4	80.4
#50	0.8	3.1	23.1	9.7	90.3	90.3
#100	0.7	2.8	6.4	3.1	96.9	96.9
LBW	0.6	2.5	1.3	1.1	98.9	98.9

*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	Adjusted WF
Coarseness Factor: 61	Workability Factor: 34		36.7



Sieve	Initial Production Sample (IPS)	Coarseness Factor: 61	Workability Factor: 36
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi

Product 1051-6AA LS

Period: 06/18/2023 - 06/24/2023

Name/Title Doug Storey / QC Technician

Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	100.0	%	95-100
	3/4" (19mm)	90.0	%	
	1/2" (12.5mm)	48.3	%	30-60
	3/8" (9.5mm)	22.2	%	
	#4 (4.75mm)	2.5	%	0-8
	#8 (2.36mm)	1.0	%	
	#16 (1.18mm)	0.8	%	
	#30 (.6mm)	0.8	%	
	#50 (.3mm)	0.8	%	
	#100 (.15mm)	0.7	%	
	#200 (75µm)	0.66	%	
	Wash Loss (#200/75µm)	0.6	%	0-2
	Total Moisture	4.01	%	



Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 06/18/2023 - 06/24/2023

Name/Title Doug Storey / QC Technician

Report Date 06/23/2023

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)	99.1	%	95-100
	3/8" (9.5mm)	92.3	%	60-95
	#4 (4.75mm)	18.6	%	5-30
	#8 (2.36mm)	6.5	%	0-12
	#16 (1.18mm)	4.1	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.17	%	



Plant S102-Superior Novi
 Product 1022-2NS GR
 Period: 06/18/2023 - 06/24/2023

Name/Title Doug Storey / QC Technician
 Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.2	%	95-100
	#8 (2.36mm)	84.8	%	65-95
	#16 (1.18mm)	66.8	%	35-75
	#30 (.6mm)	48.2	%	20-55
	#50 (.3mm)	23.1	%	10-30
	#100 (.15mm)	6.4	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.37	%	