

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

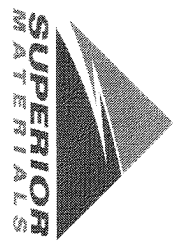
Sample Date: **4/24/23**

Dates Test Represents: **4/25/2023** through **5/1/2023**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



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

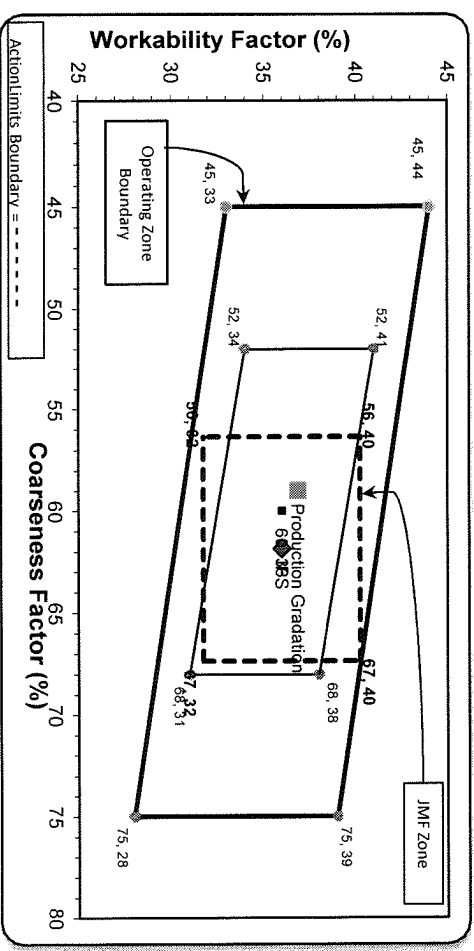
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %	
6AA	71-47	Presque Isle	1405	8.59	2.62	48.4	
26A	71-47	Presque Isle	350	2.14	2.62	12.0	
2NS	95-013	Smeller Bay	1150	6.95	2.65	39.6	
Total Wt:						2905	100.0

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"	84.8	100.0	100.0	92.6	7.4	7.4
1/2"	40.0	97.3	100.0	70.7	29.3	29.3
3/8"	23.3	86.7	100.0	61.3	38.7	38.7
#4	2.7	21.4	96.1	41.9	58.1	58.1
#8	1.4	5.9	83.3	34.4	65.6	65.6
#16	1.2	3.7	68.2	28.0	72.0	72.0
#30	1.1	3.2	49.4	20.5	79.5	79.5
#50	1.1	2.9	23.7	10.3	89.7	89.7
#100	1.1	2.7	6.5	3.4	96.6	96.6
LBW	0.8	2.4	1.3	1.2	98.8	98.8

*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: **59** Workability Factor: **34** Adjusted WF: **36.9**



Initial Production Sample (IPS)

Sieve	% 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"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

Sieve	% 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"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1054-6AA LS PI

Period: 04/23/2023 - 04/29/2023

Name/Title Doug Storey / QC Technician

Report Date 04/28/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	100.0	%	95-100
	3/4" (19mm)	84.8	%	
	1/2" (12.5mm)	40.0	%	30-60
	3/8" (9.5mm)	23.3	%	
	#4 (4.75mm)	2.7	%	0-8
	#8 (2.36mm)	1.4	%	
	#16 (1.18mm)	1.2	%	
	#30 (.6mm)	1.1	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	2.7	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/23/2023 - 04/29/2023

Report Date 04/28/2023

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)	97.3	%	95-100
	3/8" (9.5mm)	86.7	%	60-95
	#4 (4.75mm)	21.4	%	5-30
	#8 (2.36mm)	5.9	%	0-12
	#16 (1.18mm)	3.7	%	
	#30 (.6mm)	3.2	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.5	%	
	Wash Loss (#200/75um)	2.4	%	0-3
	Total Moisture	2.9	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 04/23/2023 - 04/29/2023

Report Date 04/28/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.1	%	95-100
	#8 (2.36mm)	83.3	%	65-95
	#16 (1.18mm)	68.2	%	35-75
	#30 (.6mm)	49.4	%	20-55
	#50 (.3mm)	23.7	%	10-30
	#100 (.15mm)	6.5	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.73		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	4.3	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

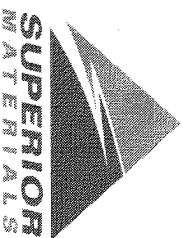
Sample Date: 4/24/23

Dates Test Represents: 4/25/2023 through 5/1/2023

Concrete Grade: DM 4500HP

Contractor: _____

MDOT No.: _____



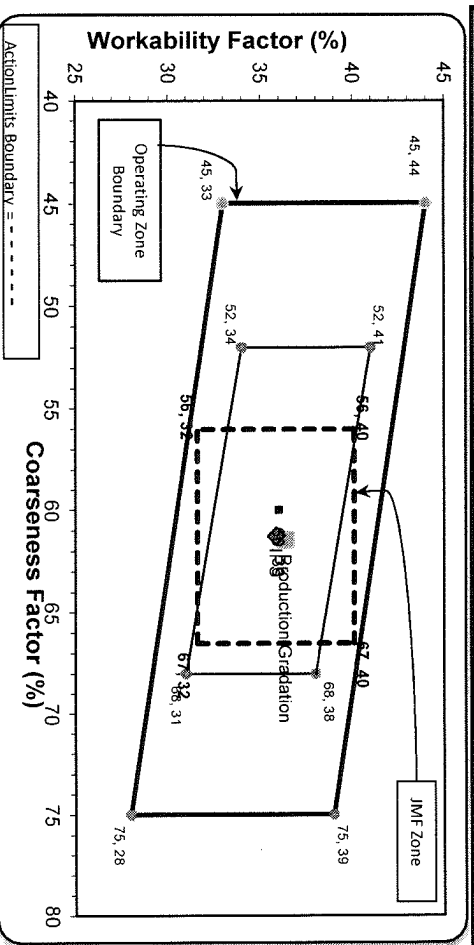
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %	
6AA	58-003	Stoneco	1550	9.23	2.69	52.5	
26A	58-003	Stoneco	250	1.49	2.69	8.5	
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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	86.7	100.0	100.0	93.0	6.7	7.0
1/2"	46.9	98.7	100.0	72.0	21.0	28.0
3/8"	24.9	85.9	100.0	59.3	12.6	40.7
#4	4.1	9.9	98.6	41.4	17.9	58.6
#8	1.7	3.1	83.9	33.9	7.6	66.1
#16	1.3	2.3	66.1	26.6	7.2	73.4
#30	1.2	2.0	47.1	19.2	7.5	80.8
#50	1.1	1.8	22.0	9.3	9.9	90.7
#100	1.0	1.7	6.1	3.0	6.3	97.0
LBW	0.8	1.6	1.4	1.1	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. Max. 1.5") aggregate is used.

Production Gradation	Batch Plant Gradations	Aggregate Supplier Gradations
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coarseness Factor: 61	Workability Factor: 34	Adjusted WF: 36.4



Sieve	Initial Production Sample (IPS)	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	100.0	61	36	36.4
1.5"	100.0	61	36	36.4
1"	99.3	61	36	36.4
3/4"	89.2	61	36	36.4
1/2"	70.7	61	36	36.4
3/8"	60.7	61	36	36.4
#4	44.4	61	36	36.4
#8	35.9	61	36	36.4
#16	27.3	61	36	36.4
#30	19.1	61	36	36.4
#50	7.4	61	36	36.4
#100	1.9	61	36	36.4
LBW	0.7	61	36	36.4

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi
Product 1051-6AA LS
Period: 04/23/2023 - 04/29/2023

Name/Title Doug Storey / QC Technician
Report Date 04/28/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.5	%	95-100
	3/4" (19mm)	86.7	%	
	1/2" (12.5mm)	46.9	%	30-60
	3/8" (9.5mm)	24.9	%	
	#4 (4.75mm)	4.1	%	0-8
	#8 (2.36mm)	1.7	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	0.92	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	2.94	%	



Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 04/23/2023 - 04/29/2023

Name/Title Doug Storey / QC Technician

Report Date 04/28/2023

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)	98.7	%	95-100
	3/8" (9.5mm)	85.9	%	60-95
	#4 (4.75mm)	9.9	%	5-30
	#8 (2.36mm)	3.1	%	0-12
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75µm)	1.6	%	0-3
	Total Moisture	4.04	%	



Plant S102-Superior Novi
 Product 1022-2NS GR
 Period: 04/23/2023 - 04/29/2023

Name/Title Doug Storey / QC Technician
 Report Date 04/28/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.6	%	95-100
	#8 (2.36mm)	83.9	%	65-95
	#16 (1.18mm)	66.1	%	35-75
	#30 (.6mm)	47.1	%	20-55
	#50 (.3mm)	22.0	%	10-30
	#100 (.15mm)	6.1	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	4.69	%	