

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **12**

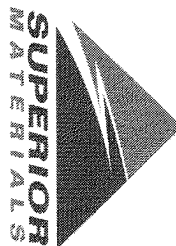
Sample Date: 11/13/23

Dates Test Represents: 11/14/2023 through 11/20/2023

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
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Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	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		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"	98.7	100.0	100.0	99.4	0.6	0.6
3/4"	84.9	100.0	100.0	92.5	6.9	7.5
1/2"	44.8	95.0	100.0	71.9	20.5	28.1
3/8"	24.2	82.7	100.0	60.3	11.6	39.7
#4	4.6	19.3	96.5	42.5	17.8	57.5
#8	1.8	5.1	80.7	33.4	9.1	66.6
#16	1.4	2.9	65.2	26.8	6.6	73.2
#30	1.3	2.4	49.7	20.6	6.2	79.4
#50	1.3	2.2	24.5	10.6	10.0	89.4
#100	1.2	1.9	5.2	2.9	7.7	97.1
LBW	1.0	1.7	0.7	1.0	1.9	99.0

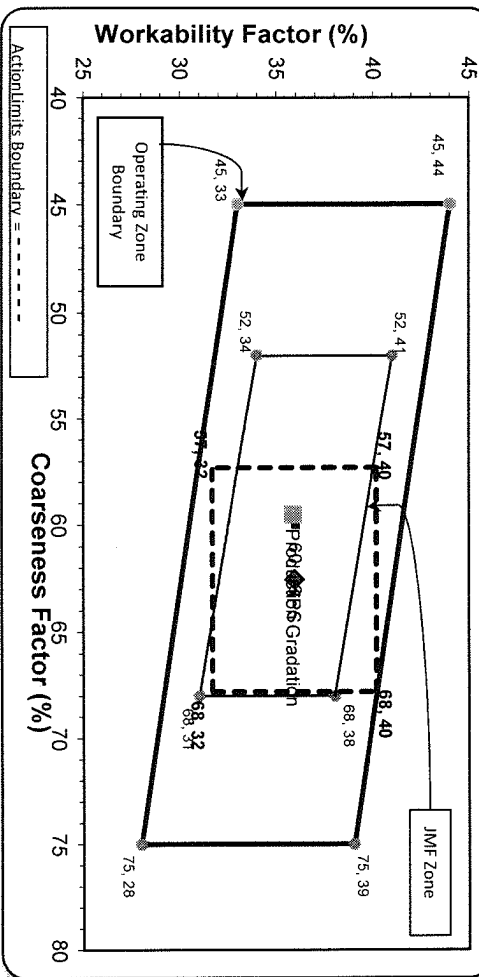
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF

Initial Production Sample (IPS)

Coarseness Factor:	60	Workability Factor:	33
Coarseness Factor:		Adjusted WF	
63		36	

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



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 S22-Onsite Southfield

Product 1054-6AA LS PI

Period: 11/12/2023 - 11/18/2023

Name/Title Doug Storey / QC Technician

Report Date 11/18/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.7	%	95-100
	3/4" (19mm)	84.9	%	
	1/2" (12.5mm)	44.8	%	30-60
	3/8" (9.5mm)	24.2	%	
	#4 (4.75mm)	4.6	%	0-8
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.4	%	
	#30 (.6mm)	1.3	%	
	#50 (.3mm)	1.3	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.12	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.96	%	



Plant S22-Onsite Southfield

Product 1067-26A Mod LS

Period: 11/12/2023 - 11/18/2023

Name/Title Doug Storey / QC Technician

Report Date 11/18/2023

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)	95.0	%	95-100
	3/8" (9.5mm)	82.7	%	60-95
	#4 (4.75mm)	19.3	%	5-30
	#8 (2.36mm)	5.1	%	0-12
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.69	%	



Plant S22-Onsite Southfield

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 11/12/2023 - 11/18/2023

Report Date 11/18/2023

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)	80.7	%	65-95
	#16 (1.18mm)	65.2	%	35-75
	#30 (.6mm)	49.7	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	5.2	%	0-10
	#200 (75µm)	0.8	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	0.7	%	0-3
	Total Moisture	3.67	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

Sample Date: 11/13/23

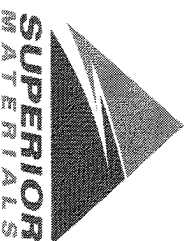
Dates Test Represents: 11/14/2023 through 11/20/2023

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1375	8.19	2.69	46.6
26A	58-003	Stoneco	425	2.53	2.69	14.4
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt						17.68
						100.0



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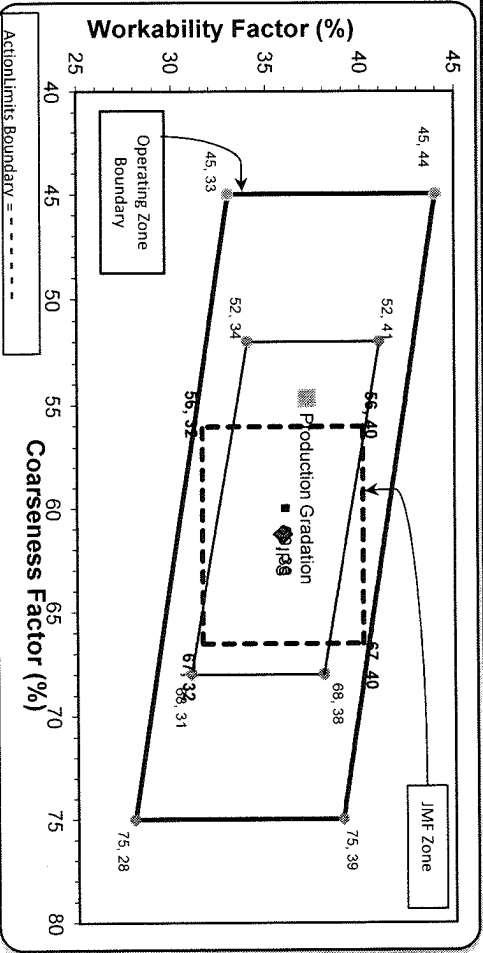
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	87.2	100.0	100.0	94.0	6.0	6.0
1/2"	49.9	99.9	100.0	76.6	17.4	23.4
3/8"	26.4	90.1	100.0	64.3	12.4	35.7
#4	3.9	16.0	98.5	42.5	21.7	57.5
#8	1.9	5.8	84.5	34.7	7.9	65.3
#16	1.6	4.4	65.1	26.8	7.9	73.2
#30	1.5	3.7	45.0	18.8	8.0	81.2
#50	1.5	3.4	19.4	8.8	10.0	91.2
#100	1.4	3.2	3.7	2.6	6.2	97.4
LBW	1.3	3.0	0.7	1.3	1.2	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 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

Coarseness Factor: **55** Workability Factor: **35** Adjusted WF: **37.2**

Initial Production Sample (IPS) Coarseness Factor: **61** 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"	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

Name/Title Doug Storey / QC Technician

Period: 11/12/2023 - 11/18/2023

Report Date 11/18/2023

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)	87.2	%	
	1/2" (12.5mm)	49.9	%	30-60
	3/8" (9.5mm)	26.4	%	
	#4 (4.75mm)	3.9	%	0-8
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.37	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	2.84	%	



Plant S102-Superior Novi
 Product 1067-26A Mod LS
 Period: 11/12/2023 - 11/18/2023

Name/Title Doug Storey / QC Technician
 Report Date 11/18/2023

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)	99.9	%	95-100
	3/8" (9.5mm)	90.1	%	60-95
	#4 (4.75mm)	16.0	%	5-30
	#8 (2.36mm)	5.8	%	0-12
	#16 (1.18mm)	4.4	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.4	%	
	#100 (.15mm)	3.2	%	
	#200 (75µm)	3.1	%	
	Wash Loss (#200/75um)	3.0	%	0-3
	Total Moisture	3.01	%	



Plant S102-Superior Novi
Product 1022-2NS GR
Period: 11/12/2023 - 11/18/2023

Name/Title Doug Storey / QC Technician
Report Date 11/18/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.5	%	95-100
	#8 (2.36mm)	84.5	%	65-95
	#16 (1.18mm)	65.1	%	35-75
	#30 (.6mm)	45.0	%	20-55
	#50 (.3mm)	19.4	%	10-30
	#100 (.15mm)	3.7	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.84		2.6-3
	Wash Loss (#200/75µm)	0.7	%	0-3
	Total Moisture	3.29	%	