

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 12/12/22

Dates Test Represents: 12/13/2022 through 12/19/2022

Concrete Grade: DM, 4500HP

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

<----- Verify this number is 100%

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"	97.6	100.0	100.0	98.8	1.2	1.2
3/4"	82.6	100.0	100.0	91.3	7.5	8.7
1/2"	43.4	97.3	100.0	71.4	19.9	28.6
3/8"	27.6	82.8	100.0	62.0	9.4	38.0
#4	6.8	10.8	95.2	42.2	19.8	57.8
#8	3.0	3.1	83.2	34.8	7.4	65.2
#16	2.6	1.9	68.0	28.4	6.3	71.6
#30	2.5	1.6	49.2	20.9	7.5	79.1
#50	2.4	1.5	23.7	10.7	10.2	89.3
#100	2.2	1.4	6.4	3.8	7.0	96.2
LBW	1.9	1.2	1.1	1.5	2.3	98.5

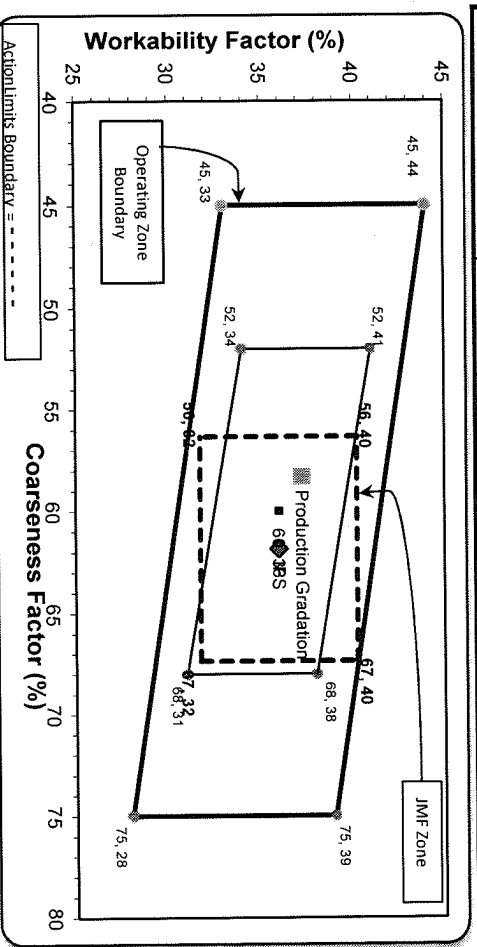
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 58 **Workability Factor:** 35 **Adjusted WF:** 37.3

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



PREPARED BY:
SM, LLC Technical Service

Approved By: _____



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

Plant 958-JMT
 Product 1022-2NS GR - Smelter Bay
 Period: 12/11/2022 - 12/17/2022

Name/Title Doug Storey / QC Technician
 Report Date 12/17/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.2	%	95-100
	#8 (2.36mm)	83.2	%	65-95
	#16 (1.18mm)	68.0	%	35-75
	#30 (.6mm)	49.2	%	20-55
	#50 (.3mm)	23.7	%	10-30
	#100 (.15mm)	6.4	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75µm)	1.1	%	0-3
	Total Moisture	5.5	%	

Plant 958-JMT
 Product 1067-26A Mod LS
 Period: 12/11/2022 - 12/17/2022

Name/Title Doug Storey / QC Technician
 Report Date 12/17/2022

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)	82.8	%	60-95
	#4 (4.75mm)	10.8	%	5-30
	#8 (2.36mm)	3.1	%	0-12
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	3.8	%	

Plant: 958-JMT
 Product: 1054-6AA LS PI
 Period: 12/11/2022 - 12/17/2022

Name/Title: Doug Storey / QC Technician
 Report Date: 12/17/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.2	%	95-100
	3/4" (19mm)	86.3	%	
	1/2" (12.5mm)	47.8	%	30-60
	3/8" (9.5mm)	26.7	%	
	#4 (4.75mm)	3.5	%	0-8
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	3.3	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-103

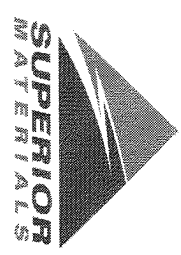
Sample Date: 12/12/22

Dates Test Represents: 12/13/2022 through 12/19/2022

Concrete Grade: DM 4500HP

Contractor: _____

MDOT No.: _____



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

<----- Verify this number is 100%

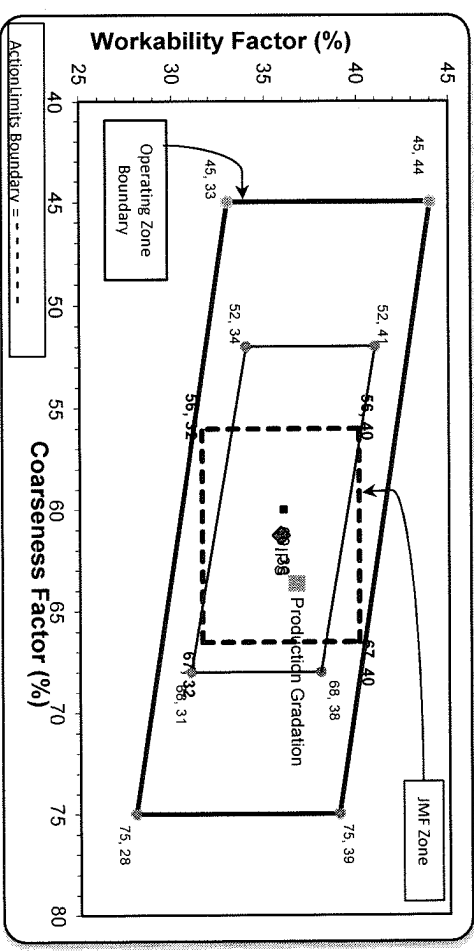
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %	
6AA	58-003	Stonoco	1500	8.94	2.69	50.8	
26A	58-003	Stonoco	300	1.79	2.69	10.2	
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0	
Total Wt:						2950	100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.0	0.0
3/4"	0.0	0.0
1/2"	9.4	9.4
3/8"	20.9	30.3
#4	11.6	41.9
#8	16.8	58.7
#16	7.1	65.8
#30	6.7	72.5
#50	6.9	79.4
#100	9.6	89.1
LBW	6.8	95.8
	2.2	98.0

*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: 64 Workability Factor: 34 Adjusted WF: 36.7



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 S103-Superior Brighton
Product 1022-2NS GR
Period: 12/11/2022 - 12/17/2022

Name/Title Doug Storey / QC Technician
Report Date 12/16/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.9	%	95-100
	#8 (2.36mm)	83.3	%	65-95
	#16 (1.18mm)	67.0	%	35-75
	#30 (.6mm)	49.6	%	20-55
	#50 (.3mm)	25.2	%	10-30
	#100 (.15mm)	8.0	%	0-10
	#200 (75µm)	3.0	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75um)	2.7	%	0-3
	Total Moisture	2.92	%	



Plant S103-Superior Brighton
Product 1067-26A Mod LS
Period: 12/11/2022 - 12/17/2022

Name/Title Doug Storey / QC Technician
Report Date 12/16/2022

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)	99.8	%	95-100
	3/8" (9.5mm)	88.7	%	60-95
	#4 (4.75mm)	6.3	%	5-30
	#8 (2.36mm)	2.2	%	0-12
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	2.74	%	



Plant S103-Superior Brighton
Product 1051-6AA LS
Period: 12/11/2022 - 12/17/2022

Name/Title Doug Storey / QC Technician
Report Date 12/16/2022

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)	81.6	%	
	1/2" (12.5mm)	40.5	%	30-60
	3/8" (9.5mm)	19.9	%	
	#4 (4.75mm)	4.9	%	0-8
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.72	%	
	Wash Loss (#200/75µm)	1.6	%	0-2
	Total Moisture	2.47	%	