

# Aggregate Optimization Chart

## Production Gradation Report

PLANT #: 12

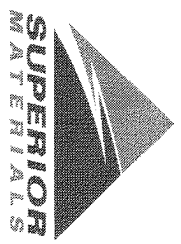
Sample Date: 9/4/23

Dates Test Represents: 9/5/2023 through 9/11/2023

Concrete Grade: DM 4500HP

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



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

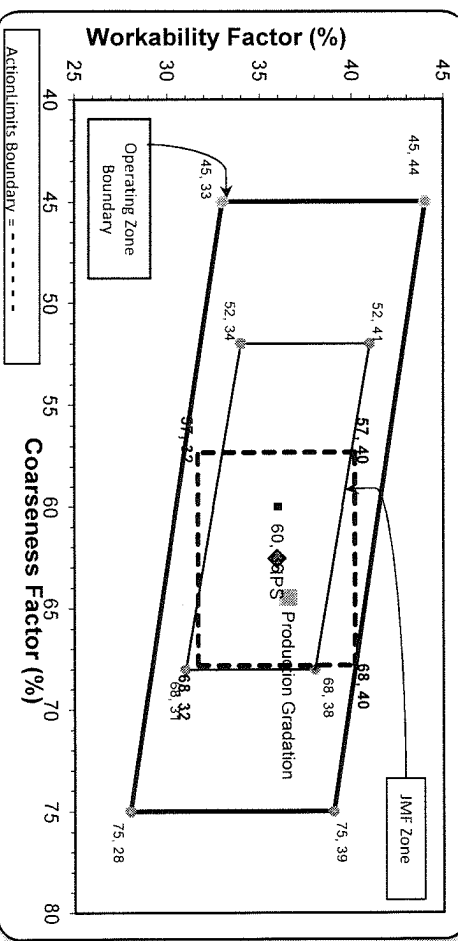
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		<b>Total Wt</b>	<b>2905</b>	<b>17.69</b>		<b>100.0</b>

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"	95.9	100.0	100.0	98.0	2.0	2.0
3/4"	74.3	100.0	100.0	87.2	10.8	12.8
1/2"	33.7	95.7	100.0	66.5	20.7	33.5
3/8"	17.8	85.9	100.0	57.5	9.0	42.5
#4	2.8	26.5	96.5	42.4	15.1	57.6
#8	1.9	7.3	81.7	34.1	8.3	65.9
#16	1.7	3.5	67.1	27.8	6.3	72.2
#30	1.6	2.8	50.9	21.2	6.5	78.8
#50	1.6	2.5	25.5	11.2	10.1	88.8
#100	1.5	2.3	5.3	3.1	8.1	96.9
LBW	1.1	2.1	1.0	1.2	1.9	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 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: **64** Workability Factor: **34** Adjusted W/F: **36.6**



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"	95.9	100.0	100.0	98.3	0.7	0.7
3/4"	74.3	100.0	100.0	89.0	10.3	11.0
1/2"	33.7	95.7	100.0	70.3	18.7	29.7
3/8"	17.8	85.9	100.0	59.9	10.4	40.1
#4	2.8	26.5	96.5	41.9	18.0	58.1
#8	1.9	7.3	81.7	35.9	6.0	64.1
#16	1.7	3.5	67.1	27.8	8.2	72.2
#30	1.6	2.8	50.9	18.9	8.8	81.1
#50	1.6	2.5	25.5	6.3	12.6	93.7
#100	1.5	2.3	5.3	1.7	4.6	98.3
LBW	1.1	2.1	1.0	1.0	0.7	99.0

PREPARED BY:  
SM, LLC Technical Service

Approved By: \_\_\_\_\_



Plant S12-Onsite Southfield

Product 1051-6AA LS

Period: 09/03/2023 - 09/09/2023

Name/Title Doug Storey / QC Technician

Report Date 09/09/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	95.9	%	95-100
	3/4" (19mm)	74.3	%	
	1/2" (12.5mm)	33.7	%	30-60
	3/8" (9.5mm)	17.8	%	
	#4 (4.75mm)	2.8	%	0-8
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.28	%	
	Wash Loss (#200/75µm)	1.1	%	0-2
	Total Moisture	1.48	%	



Plant S12-Onsite Southfield

Product 1051-6AA LS

Period: 09/03/2023 - 09/09/2023

Name/Title Doug Storey / QC Technician

Report Date 09/09/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	95.9	%	95-100
	3/4" (19mm)	74.3	%	
	1/2" (12.5mm)	33.7	%	30-60
	3/8" (9.5mm)	17.8	%	
	#4 (4.75mm)	2.8	%	0-8
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.28	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	1.48	%	



Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Period: 09/03/2023 - 09/09/2023

Name/Title Doug Storey / QC Technician

Report Date 09/09/2023

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)	95.7	%	95-100
	3/8" (9.5mm)	85.9	%	60-95
	#4 (4.75mm)	26.5	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	3.5	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75µm)	2.1	%	0-3
	Total Moisture	2.80	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 09/03/2023 - 09/09/2023

Name/Title Doug Storey / QC Technician

Report Date 09/09/2023

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)	81.7	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	50.9	%	20-55
	#50 (.3mm)	25.5	%	10-30
	#100 (.15mm)	5.3	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.73		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.31	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-32**

Sample Date: **9/4/23**

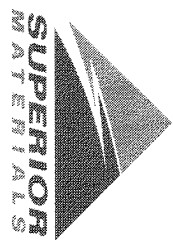
Dates Test Represents: **9/5/2023**

through **9/11/2023**

Concrete Grade: **DM, 4500HP**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



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

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

Agg. Class	Pit #	Source	Weight (ssd)	ft <sup>3</sup>	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	Smeiter Bay	1150	6.95	2.65	39.6
		<b>Total Wt</b>	<b>2905</b>	<b>17.69</b>		<b>100.0</b>

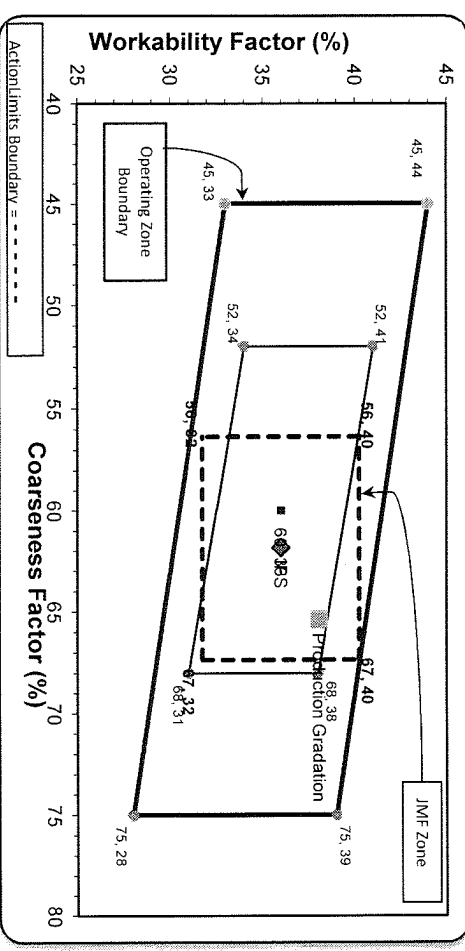
  

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.4	100.0	100.0	98.7	1.3	1.3
3/4"	76.2	100.0	100.0	88.1	10.6	11.9
1/2"	31.0	95.2	100.0	64.9	23.1	35.1
3/8"	18.7	86.4	100.0	57.9	7.1	42.1
#4	3.6	24.9	96.5	42.6	15.3	57.4
#8	2.0	6.6	85.6	35.6	7.0	64.4
#16	1.8	3.3	70.5	29.2	6.4	70.8
#30	1.7	2.6	50.5	21.1	8.0	78.9
#50	1.6	2.4	24.1	10.6	10.5	89.4
#100	1.5	2.2	7.4	3.9	6.7	96.1
LBW	1.2	2.0	1.5	1.4	2.5	98.6

\*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. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **65** Workability Factor: **36** Adjusted WF: **38.1**



Sieve	Coarseness Factor:	Workability Factor:	Adjusted WF
2"	62	36	38.1
1.5"	62	36	38.1
1"	62	36	38.1
3/4"	62	36	38.1
1/2"	62	36	38.1
3/8"	62	36	38.1
#4	62	36	38.1
#8	62	36	38.1
#16	62	36	38.1
#30	62	36	38.1
#50	62	36	38.1
#100	62	36	38.1
LBW	62	36	38.1

PREPARED BY:  
 SM, LLC Technical Service

Approved By: \_\_\_\_\_

# Edw. C. Levy Co.

JMT  
 8911 W. Jefferson  
 Detroit, 48209  
 (313) 429-2429

**Plant** 958-JMT

**Product** 1054-6AA LS PI

**Name/Title** Doug Storey / QC Technician

**Period:** 09/03/2023 - 09/09/2023

**Report Date** 09/09/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.4	%	95-100
	3/4" (19mm)	76.2	%	
	1/2" (12.5mm)	31.0	%	30-60
	3/8" (9.5mm)	18.7	%	
	#4 (4.75mm)	3.6	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	1.9	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/03/2023 - 09/09/2023

Report Date 09/09/2023

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)	95.2	%	95-100
	3/8" (9.5mm)	86.4	%	60-95
	#4 (4.75mm)	24.9	%	5-30
	#8 (2.36mm)	6.6	%	0-12
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	2.3	%	



Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 09/03/2023 - 09/09/2023

Report Date 09/09/2023

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)	85.6	%	65-95
	#16 (1.18mm)	70.5	%	35-75
	#30 (.6mm)	50.5	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	3.3	%	

# Aggregate Optimization Chart

## Production Gradation Report

PLANT #: P-102

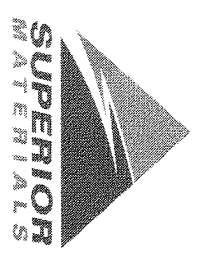
Sample Date: 9/4/23

Dates Test Represents: 9/5/2023 through 9/11/2023

Concrete Grade: DM 4500HP

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



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

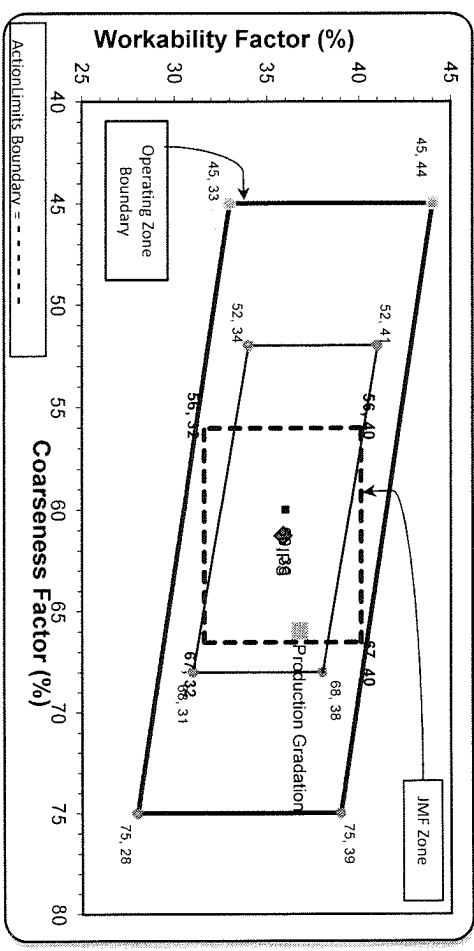
Aggr. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1525	9.09	2.69	51.7
26A	58-003	Stoneco	275	1.64	2.69	9.3
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
			<b>Total Wt</b>	<b>2950</b>		<b>100.0</b>

Sieve	6AA	26A	2NS	Cumulative % Passing
2"	100.0	100.0	100.0	100.0
1.5"	100.0	100.0	100.0	100.0
1"	99.6	100.0	100.0	99.8
3/4"	72.2	100.0	100.0	85.6
1/2"	36.2	100.0	100.0	67.0
3/8"	17.8	90.8	100.0	56.6
#4	3.8	15.1	98.0	41.6
#8	1.9	6.6	83.8	34.3
#16	1.6	4.6	67.4	27.5
#30	1.5	3.7	48.9	20.2
#50	1.4	3.2	23.7	10.3
#100	1.4	3.0	5.0	3.0
LBW	1.2	2.7	0.5	1.1

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **66** Workability Factor: **34** Adjusted WF: **36.8**



Initial Production Sample (IPS)

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.2	0.2
3/4"	14.2	14.4
1/2"	18.6	33.0
3/8"	10.4	43.4
#4	15.1	58.4
#8	7.3	65.7
#16	6.7	72.5
#30	7.3	79.8
#50	9.9	89.7
#100	7.3	97.0
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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Coarseness Factor:	61
Workability Factor:	36
Adjusted WF:	36.8

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: 09/03/2023 - 09/09/2023

Report Date 09/09/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.6	%	95-100
	3/4" (19mm)	72.2	%	
	1/2" (12.5mm)	36.2	%	30-60
	3/8" (9.5mm)	17.8	%	
	#4 (4.75mm)	3.8	%	0-8
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.24	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	2.95	%	



Plant S102-Superior Novi

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/03/2023 - 09/09/2023

Report Date 09/09/2023

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)	100.0	%	95-100
	3/8" (9.5mm)	90.8	%	60-95
	#4 (4.75mm)	15.1	%	5-30
	#8 (2.36mm)	6.6	%	0-12
	#16 (1.18mm)	4.6	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75µm)	2.7	%	0-3
	Total Moisture	1.55	%	



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/03/2023 - 09/09/2023

Report Date 09/09/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.0	%	95-100
	#8 (2.36mm)	83.8	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	48.9	%	20-55
	#50 (.3mm)	23.7	%	10-30
	#100 (.15mm)	5.0	%	0-10
	#200 (75µm)	0.8	%	
	FM	2.73		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	2.34	%	