

# Aggregate Optimization Chart

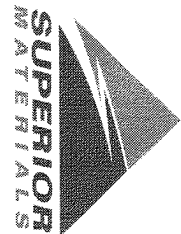
# Production Gradation Report

PLANT #: **P-32**

Sample Date: **9/25/23**  
 Dates Test Represents: **9/26/2023** through **10/2/2023**  
 Concrete Grade: **S2M, 3500HP**

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

MIDOT 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	1500	9.17	2.62	49.2
26A	71-47	Presque Isle	320	1.96	2.62	10.5
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
<b>Total Wt</b>			<b>3050</b>	<b>18.57</b>		<b>100.0</b>

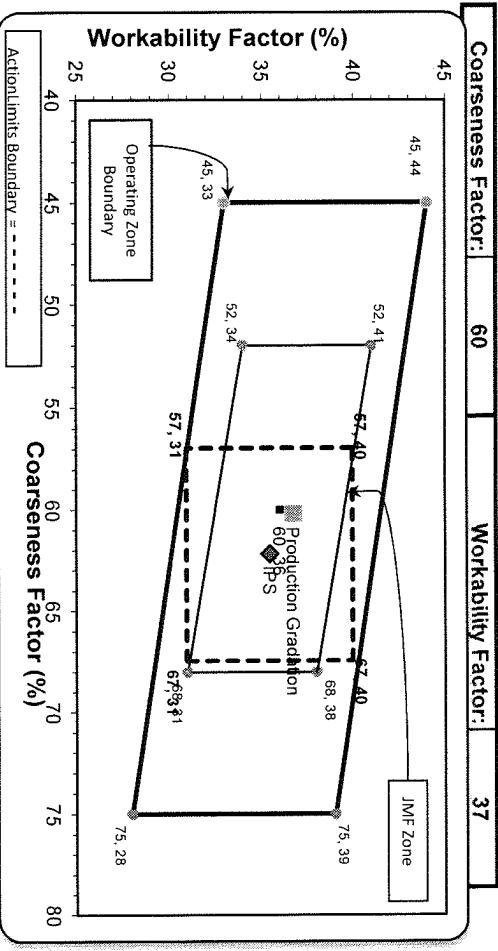
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.7	100.0	100.0	98.9	1.1	1.1
3/4"	74.5	100.0	100.0	87.5	11.4	12.5
1/2"	38.5	100.0	95.3	69.3	18.2	30.7
3/8"	26.0	84.0	100.0	61.9	7.3	38.1
#4	6.3	22.2	96.5	44.3	17.6	55.7
#8	3.4	6.0	85.4	36.7	7.6	63.3
#16	3.0	3.2	71.0	30.4	6.3	69.6
#30	2.8	2.5	50.9	22.2	8.3	77.8
#50	2.7	2.3	24.5	11.4	10.7	88.6
#100	2.5	2.2	7.4	4.4	7.0	95.6
LBW	1.8	2.0	1.1	1.5	2.9	98.5

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

\*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

Initial Production Sample (IPS)



Sieve	Cumulative % 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"	94.0	6.0	6.0
1/2"	70.2	23.7	29.8
3/8"	59.9	10.4	40.1
#4	42.7	17.2	57.3
#8	35.5	7.2	64.5
#16	28.4	7.0	71.6
#30	19.2	9.2	80.8
#50	8.9	10.3	91.1
#100	3.1	5.9	96.9
LBW	1.4	1.7	98.6

PREPARED BY:  
 SM, LLC Technical Service

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

**Plant** 958-JMT  
**Product** 1054-6AA LS PI  
**Period:** 09/24/2023 - 09/30/2023

**Name/Title** Doug Storey / QC Technician  
**Report Date** 09/30/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.7	%	95-100
	3/4" (19mm)	74.5	%	
	1/2" (12.5mm)	38.5	%	30-60
	3/8" (9.5mm)	26.0	%	
	#4 (4.75mm)	6.3	%	0-8
	#8 (2.36mm)	3.4	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75µm)	1.8	%	0-2
	Total Moisture	3.0	%	

Plant 958-JMT  
 Product 1067-26A Mod LS  
 Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
 Report Date 09/30/2023

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)	95.3	%	95-100
	3/8" (9.5mm)	84.0	%	60-95
	#4 (4.75mm)	22.2	%	5-30
	#8 (2.36mm)	6.0	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	2.3	%	

Plant 958-JMT  
 Product 1022-2NS GR - Smelter Bay  
 Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
 Report Date 09/30/2023

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)	85.4	%	65-95
	#16 (1.18mm)	71.0	%	35-75
	#30 (.6mm)	50.9	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.64		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.4	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-35**

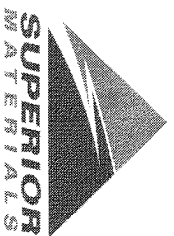
Sample Date: **9/25/23**

Dates Test Represents: **9/26/2023** through **10/2/2023**

Concrete Grade: **S2M, 3500HP**

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	
GAA	58-003	Stoneco	1625	9.68	2.69	52.4	
26A	58-003	Stoneco	275	1.64	2.69	8.9	
NNS	81-019	Pleasant Lake	1200	7.26	2.65	38.7	
<b>Total Wt</b>						<b>3100</b>	<b>100.0</b>

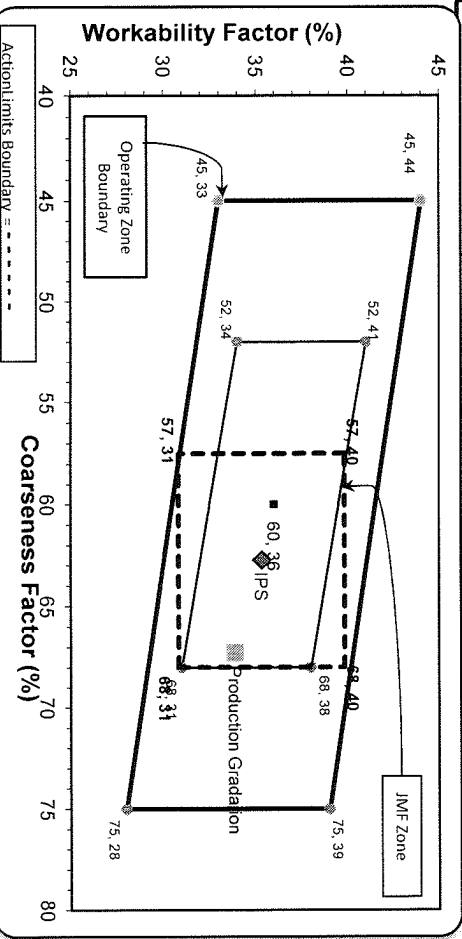
  

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	86.3	100.0	100.0	92.8	7.2	7.2
1/2"	39.3	99.1	100.0	68.1	24.7	31.9
3/8"	18.1	82.6	100.0	55.5	12.6	44.5
#4	3.5	12.3	98.0	40.9	14.7	59.1
#8	2.1	5.6	83.4	33.9	7.0	66.1
#16	1.8	4.2	63.4	25.9	8.0	74.1
#30	1.7	3.7	44.2	18.3	7.5	81.7
#50	1.5	3.2	21.0	9.2	9.1	90.8
#100	1.4	2.9	4.6	2.8	6.4	97.2
LBW	1.2	2.6	1.6	1.5	1.3	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 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: **67** Workability Factor: **34**



Initial Production Sample (IPS)

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.8	0.8
3/4"	8.3	9.1
1/2"	19.6	28.7
3/8"	11.9	40.6
#4	16.5	57.0
#8	7.6	64.7
#16	7.1	71.8
#30	6.6	78.4
#50	12.5	90.9
#100	7.4	98.3
LBW	0.6	98.9

Coarseness Factor:	63
Workability Factor:	35

PREPARED BY:  
 SM, LLC Technical Service

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



Plant S35-Superior Romulus  
 Product 1051-6AA LS  
 Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
 Report Date 09/30/2023

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)	86.3	%	
	1/2" (12.5mm)	39.3	%	30-60
	3/8" (9.5mm)	18.1	%	
	#4 (4.75mm)	3.5	%	0-8
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.31	%	
	Wash Loss (#200/75µm)	1.2	%	0-2
ASTM C566	Total Moisture	3.39	%	



Plant S35-Superior Romulus  
 Product 1067-26A Mod LS  
 Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
 Report Date 09/30/2023

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)	99.1	%	95-100
	3/8" (9.5mm)	82.6	%	60-95
	#4 (4.75mm)	12.3	%	5-30
	#8 (2.36mm)	5.6	%	0-12
	#16 (1.18mm)	4.2	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75µm)	2.6	%	0-3
ASTM C566	Total Moisture	2.99	%	



Plant S35-Superior Romulus  
Product 1022-2NS GR  
Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
Report Date 09/30/2023

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)	83.4	%	65-95
	#16 (1.18mm)	63.4	%	35-75
	#30 (.6mm)	44.2	%	20-55
	#50 (.3mm)	21.0	%	10-30
	#100 (.15mm)	4.6	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.85		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
ASTM C566	Total Moisture	4.02	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-102**

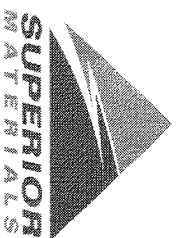
Sample Date: **9/25/23**

Dates Test Represents: **9/26/2023** through **10/2/2023**

Concrete Grade: **S2M, 3500HP**

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

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



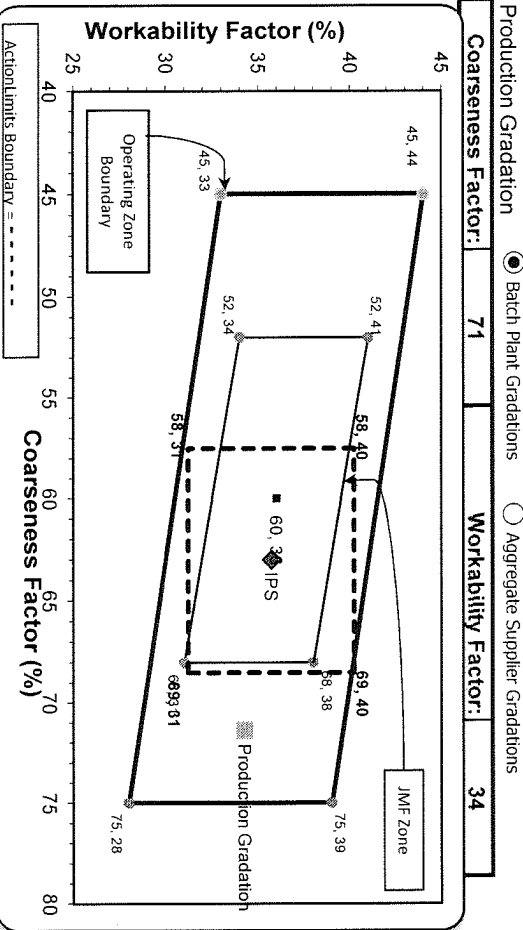
**Superior Materials, LLC**  
30701 W. 10 Mile Rd.  
Suite 500  
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %	
6AA	58-003	Stoneco	1625	9.68	2.69	52.4	
26A	58-003	Stoneco	275	1.64	2.69	8.9	
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7	
<b>Total Wt</b>						<b>3100</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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	80.7	100.0	100.0	89.9	10.1	10.1
1/2"	32.7	99.7	100.0	64.7	25.2	35.3
3/8"	12.1	90.6	100.0	53.1	11.6	46.9
#4	2.2	16.3	98.6	40.8	12.3	59.2
#8	1.4	5.5	85.4	34.3	6.5	65.7
#16	1.2	3.8	65.7	26.4	7.9	73.6
#30	1.0	3.1	45.4	18.4	8.0	81.6
#50	1.0	2.8	21.4	9.1	9.3	90.9
#100	0.9	2.7	4.4	2.4	6.6	97.6
LBW	0.8	2.3	0.5	0.8	1.6	99.2

\*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: **71** Workability Factor: **34**

Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	63	36	0.0	0.0
1.5"			0.0	0.0
1"			0.8	0.8
3/4"			8.3	9.1
1/2"			19.6	28.7
3/8"			11.8	40.5
#4			15.7	56.2
#8			8.1	64.3
#16			8.7	73.0
#30			8.4	81.4
#50			11.8	93.2
#100			5.4	98.6
LBW			0.8	99.4

PREPARED BY:  
SM, LLC Technical Service

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



Plant S102-Superior Novi  
 Product 1067-26A Mod LS  
 Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
 Report Date 09/30/2023

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)	99.7	%	95-100
	3/8" (9.5mm)	90.6	%	60-95
	#4 (4.75mm)	16.3	%	5-30
	#8 (2.36mm)	5.5	%	0-12
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.1	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.5	%	
	Wash Loss (#200/75µm)	2.3	%	0-3
	Total Moisture	3.66	%	



Plant S102-Superior Novi  
Product 1022-2NS GR  
Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
Report Date 09/30/2023

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)	85.4	%	65-95
	#16 (1.18mm)	65.7	%	35-75
	#30 (.6mm)	45.4	%	20-55
	#50 (.3mm)	21.4	%	10-30
	#100 (.15mm)	4.4	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.49	%	



Plant S102-Superior Novi  
 Product 1051-6AA LS  
 Period: 09/24/2023 - 09/30/2023

Name/Title Doug Storey / QC Technician  
 Report Date 09/30/2023

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)	80.7	%	
	1/2" (12.5mm)	32.7	%	30-60
	3/8" (9.5mm)	12.1	%	
	#4 (4.75mm)	2.2	%	0-8
	#8 (2.36mm)	1.4	%	
	#16 (1.18mm)	1.2	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.86	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	3.00	%	