

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: p11

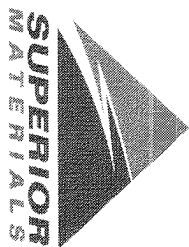
Sample Date: 5/6/24

Dates Test Represents: 5/7/2024 through 5/13/2024

Concrete Grade: DM, 4500HP

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

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

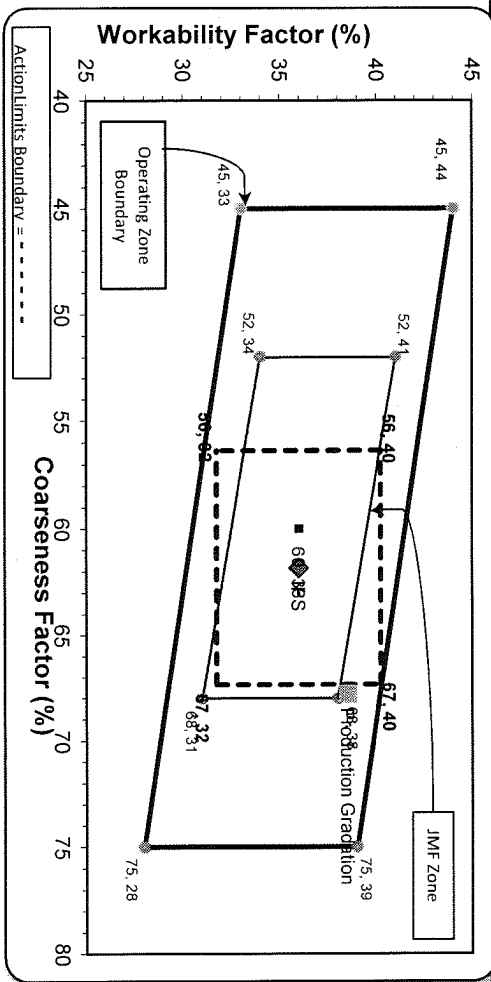


Superior Materials, LLC  
30701 W. 10 Mile Rd.  
Suite 500  
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %	
6AA	71-47	Presque Isle	1405	8.59	2.62	48.4	
26A	71-47	Presque Isle	350	2.14	2.62	12.0	
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6	
Total Wt						2905	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"	94.6	100.0	100.0	97.4	2.6	2.6	
3/4"	65.2	100.0	100.0	83.2	14.2	16.8	
1/2"	28.3	95.7	100.0	64.8	18.4	35.2	
3/8"	14.6	82.8	100.0	56.6	8.2	43.4	
#4	3.6	21.9	96.4	42.5	14.1	57.5	
#8	2.8	6.1	85.7	36.0	6.5	64.0	
#16	2.6	3.9	70.9	29.8	6.2	70.2	
#30	2.5	3.3	50.8	21.7	8.1	78.3	
#50	2.4	3.0	24.1	11.1	10.7	88.9	
#100	2.3	2.8	7.3	4.3	6.7	95.7	
LBW	1.9	2.5	1.4	1.8	2.6	98.2	

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor:	68	Workability Factor:	36	Adjusted WF	38.5
--------------------	----	---------------------	----	-------------	------



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"	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

\*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.

PREPARED BY:  
SM, LLC Technical Service

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



Plant S11-Onsite Jefferson

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	94.6	%	95-100
	3/4" (19mm)	65.2	%	
	1/2" (12.5mm)	28.3	%	30-60
	3/8" (9.5mm)	14.6	%	
	#4 (4.75mm)	3.6	%	0-8
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.12	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	1.88	%	



Plant S11-Onsite Jefferson

Product 1067-26A Mod LS

Period: 05/05/2024 - 05/11/2024

Name/Title Doug Storey / QC Technician

Report Date 05/10/2024

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)	95.7	%	95-100
	3/8" (9.5mm)	82.8	%	60-95
	#4 (4.75mm)	21.9	%	5-30
	#8 (2.36mm)	6.1	%	0-12
	#16 (1.18mm)	3.9	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.0	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.41	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	85.7	%	65-95
	#16 (1.18mm)	70.9	%	35-75
	#30 (.6mm)	50.8	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	4.70	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: 12

Sample Date: 5/6/24

Dates Test Represents: 5/7/2024 through 5/13/2024

Concrete Grade: DM, 4500HP

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

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



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

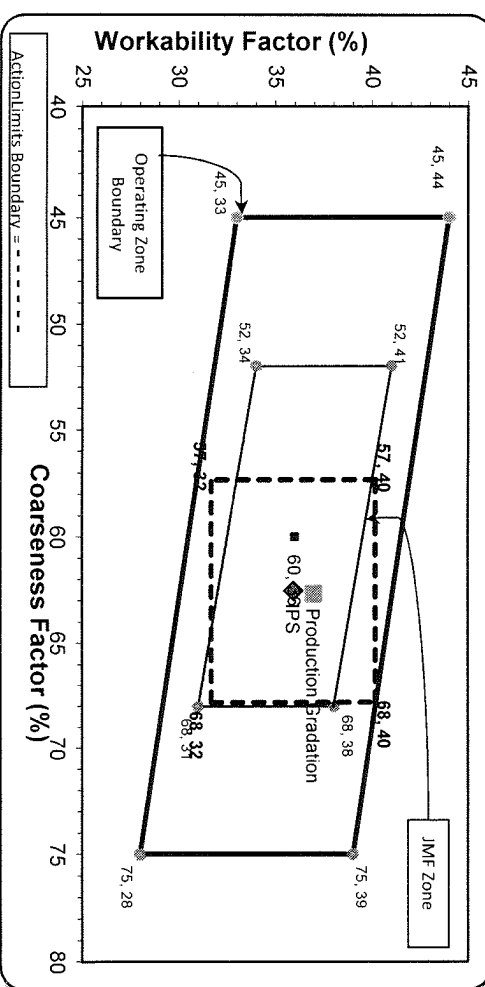
Agg. Class	Pit #	Source	Weight (ssd)	ft <sup>3</sup>	Specific Gravity	Contribution %	% Retained	Cumulative % Retained
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9	0.0	0.0
26A	71-47	Presque Isle	305	1.87	2.62	10.5	0.0	0.0
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6	1.2	1.2
		<b>Total Wt</b>	<b>2905</b>	<b>17.69</b>		<b>100.0</b>		
<b>Sieve</b>	<b>6AA</b>	<b>26A</b>	<b>2NS</b>			<b>Cumulative % Passing</b>	<b>% Retained</b>	<b>Cumulative % Retained</b>
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"	76.1	100.0	100.0			88.1	10.7	11.9
1/2"	37.6	94.9	100.0			68.3	19.8	31.7
3/8"	21.5	82.0	100.0			58.9	9.4	41.1
#4	4.6	18.2	96.4			42.4	16.6	57.6
#8	3.0	4.9	82.0			34.5	7.9	65.5
#16	2.6	3.1	67.2			28.2	6.2	71.8
#30	2.4	2.6	50.5			21.1	6.8	78.5
#50	2.3	2.2	24.5			11.1	10.4	88.9
#100	2.2	1.9	4.5			3.1	8.0	96.9
LBW	1.7	1.7	1.0			1.4	1.7	98.6

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor: **63** Workability Factor: **34**

Coarseness Factor: **63** 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"	89.0	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

\*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.

PREPARED BY:  
SM, LLC Technical Service

Approved By:



Plant S12-Onsite Southfield

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.6	%	95-100
	3/4" (19mm)	76.1	%	
	1/2" (12.5mm)	37.6	%	30-60
	3/8" (9.5mm)	21.5	%	
	#4 (4.75mm)	4.6	%	0-8
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.96	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	2.42	%	



Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Period: 05/05/2024 - 05/11/2024

Name/Title Doug Storey / QC Technician

Report Date 05/10/2024

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)	94.9	%	95-100
	3/8" (9.5mm)	82.0	%	60-95
	#4 (4.75mm)	18.2	%	5-30
	#8 (2.36mm)	4.9	%	0-12
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.03	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 05/05/2024 - 05/11/2024

Name/Title Doug Storey / QC Technician

Report Date 05/10/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	82.0	%	65-95
	#16 (1.18mm)	67.2	%	35-75
	#30 (.6mm)	50.5	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	4.5	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	2.67	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: P-102

Sample Date: 5/6/24

Dates Test Represents: 5/7/2024 through 5/13/2024

Concrete Grade: DM, 4500HP

Contractor:

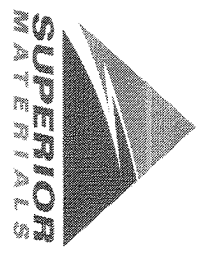
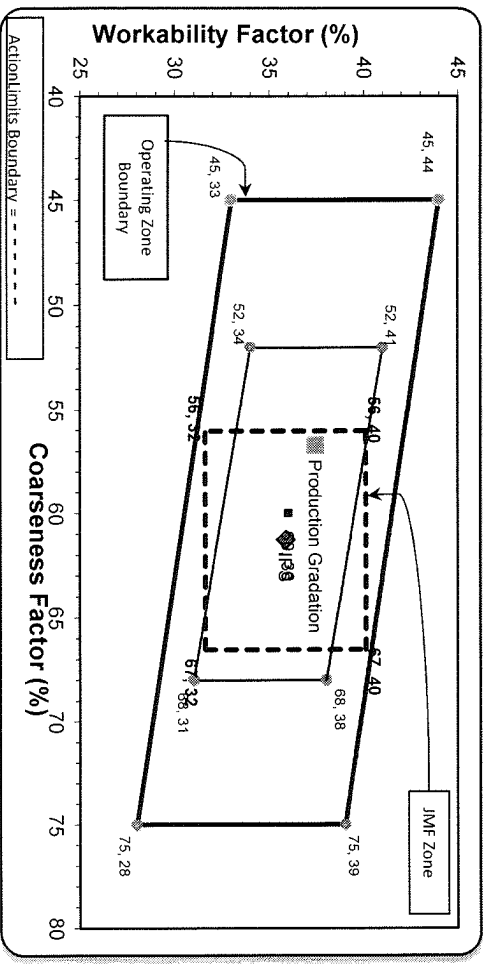
MDOT No.:

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1350	8.04	2.69	45.8
26A	58-003	Stoneco	450	2.68	2.69	15.3
2NS	63-114	Highland	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	81.6	100.0	100.0	99.5	8.4	8.4
1/2"	43.1	99.5	100.0	99.5	17.7	26.1
3/8"	22.9	89.3	100.0	100.0	10.8	36.9
#4	5.2	14.4	99.0	99.0	19.9	56.8
#8	2.5	5.1	84.7	84.7	8.2	65.1
#16	2.1	3.7	69.2	69.2	6.4	71.5
#30	2.0	3.3	52.6	52.6	6.6	78.1
#50	1.8	3.1	24.4	24.4	11.1	89.2
#100	1.8	3.0	3.0	3.0	8.4	97.5
LBW	1.6	2.8	0.3	1.3	1.2	98.7

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor:	57	Workability Factor:	35	Adjusted WF	37.4
--------------------	----	---------------------	----	-------------	------



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

\*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.

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

**Period:** 05/05/2024 - 05/11/2024

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

**Report Date** 05/10/2024

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)	43.1	%	30-60
	3/8" (9.5mm)	22.9	%	
	#4 (4.75mm)	5.2	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.69	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	3.19	%	



Plant S102-Superior Novi

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

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)	99.5	%	95-100
	3/8" (9.5mm)	89.3	%	60-95
	#4 (4.75mm)	14.4	%	5-30
	#8 (2.36mm)	5.1	%	0-12
	#16 (1.18mm)	3.7	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75um)	2.8	%	0-3
	Total Moisture	4.41	%	



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.0	%	95-100
	#8 (2.36mm)	84.7	%	65-95
	#16 (1.18mm)	69.2	%	35-75
	#30 (.6mm)	52.6	%	20-55
	#50 (.3mm)	24.4	%	10-30
	#100 (.15mm)	3.0	%	0-10
	#200 (75µm)	0.3	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	0.3	%	0-3
	Total Moisture	3.48	%	

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** P-103

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

Sample Date: 5/6/24

Concrete Grade: DM, 4500HP

Dates Test Represents: 5/7/2024 through 5/13/2024

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1350	8.04	2.69	45.8
26A	58-003	Stoneco	450	2.68	2.69	15.3
2NS	63-114	Highland	1150	6.95	2.65	39.0
<b>Total Wt</b>						<b>17.68</b>
						<b>100.0</b>

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"	99.2	100.0	100.0	99.6	0.4	0.4
3/4"	89.3	100.0	100.0	99.9	4.5	4.9
1/2"	46.8	99.9	100.0	92.0	19.5	24.4
3/8"	22.3	92.0	100.0	63.2	12.4	36.8
#4	2.9	12.2	98.5	41.6	21.6	58.4
#8	1.5	3.4	83.9	33.9	7.7	66.1
#16	1.3	2.6	67.5	27.3	6.6	72.7
#30	1.1	2.3	50.3	20.5	6.8	79.5
#50	1.1	2.1	21.3	9.1	11.3	90.9
#100	1.0	2.0	3.4	2.1	7.0	97.9
LBW	0.8	2.0	0.9	1.0	1.1	99.0

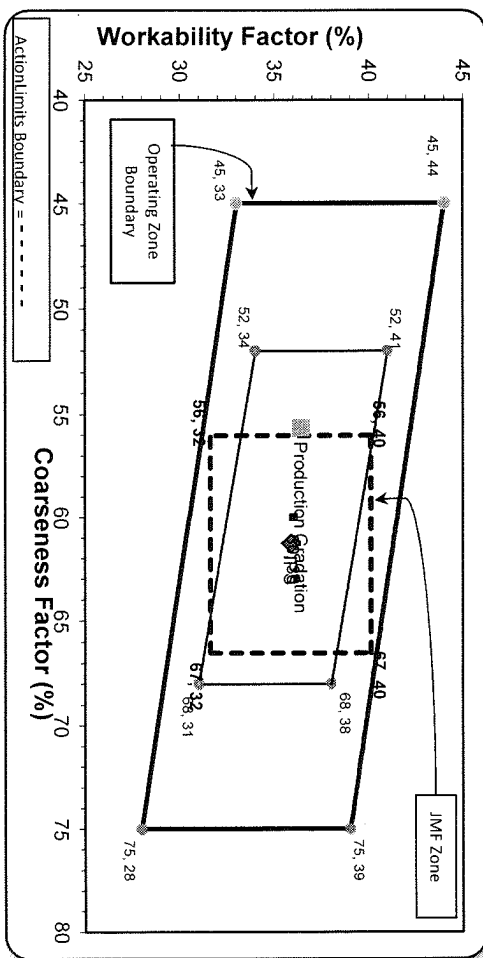
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 nom. max. #100 and #200 sieves.  
 \*\*Retained must be at least 4% for each sieve except max.  
 nom. max. #100 and #200 sieves.  
 \*\*\*Retained must be at least 4% for the 3/4" sieve when  
 a 1/2" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor:	56	Workability Factor:	34	Adjusted WF	36.4
--------------------	----	---------------------	----	-------------	------

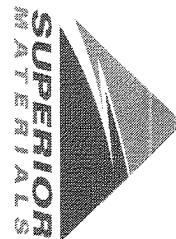
Coarseness Factor:	61
--------------------	----



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:



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



**Plant** S103-Superior Brighton

**Product** 1051-6AA LS

**Period:** 05/05/2024 - 05/11/2024

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

**Report Date** 05/10/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.2	%	95-100
	3/4" (19mm)	89.3	%	
	1/2" (12.5mm)	46.8	%	30-60
	3/8" (9.5mm)	22.3	%	
	#4 (4.75mm)	2.9	%	0-8
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.1	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	0.97	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	3.44	%	



Plant S103-Superior Brighton

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

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)	92.0	%	60-95
	#4 (4.75mm)	12.2	%	5-30
	#8 (2.36mm)	3.4	%	0-12
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.53	%	



Plant S103-Superior Brighton

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/05/2024 - 05/11/2024

Report Date 05/10/2024

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)	83.9	%	65-95
	#16 (1.18mm)	67.5	%	35-75
	#30 (.6mm)	50.3	%	20-55
	#50 (.3mm)	21.3	%	10-30
	#100 (.15mm)	3.4	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.55	%	