

# Aggregate Optimization Chart

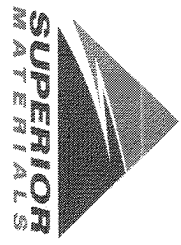
# Production Gradation Report

PLANT #: **P-02**

Sample Date: **4/15/24**  
 Dates Test Represents: **4/16/2024** through **4/22/2024**  
 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	71-47	Presque Isle	1500	9.17	2.62	49.2
26A	71-47	Presque Isle	320	1.96	2.62	10.5
2NS	63-115	Ray Rd	1230	7.44	2.65	40.3
			<b>Total Wt</b>	<b>3050</b>	<b>18.57</b>	<b>100.0</b>

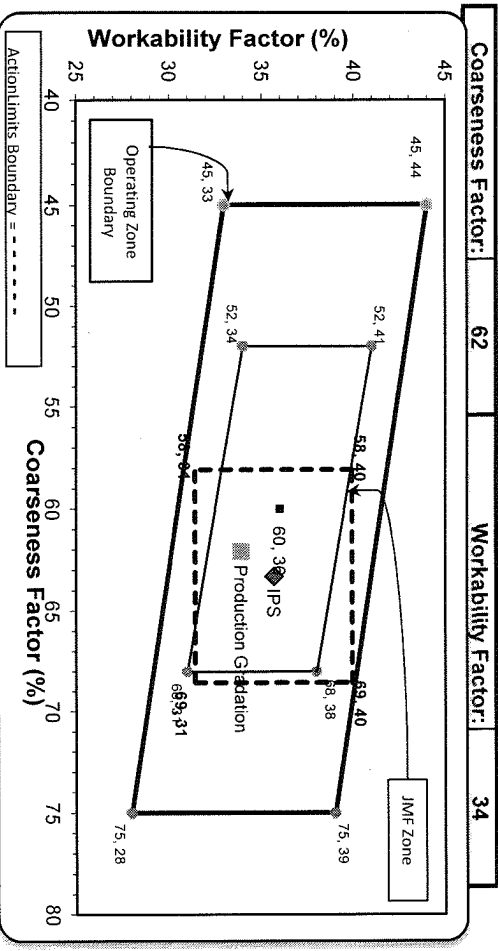
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	95.7	100.0	100.0	97.9	2.1	2.1
3/4"	80.5	100.0	100.0	90.4	7.5	9.6
1/2"	37.4	95.0	100.0	68.7	21.7	31.3
3/8"	20.1	83.6	100.0	59.0	9.7	41.0
#4	4.5	18.1	95.2	42.5	16.5	57.5
#8	2.6	4.4	79.8	33.9	8.6	66.1
#16	2.3	2.6	64.4	27.4	6.5	72.6
#30	2.2	2.3	48.2	20.8	6.6	79.2
#50	2.1	2.1	22.9	10.5	10.3	89.5
#100	2.0	2.0	3.9	2.8	7.7	97.2
LBW	1.6	1.9	0.5	1.2	1.6	98.8

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)



Coarseness Factor:	62	Workability Factor:	34
Coarseness Factor:	<b>63</b>	Workability Factor:	<b>36</b>
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"	95.6	4.4	4.4
1/2"	73.1	22.6	26.9
3/8"	59.3	13.8	40.7
#4	42.8	16.5	57.2
#8	35.7	7.1	64.3
#16	28.9	6.8	71.1
#30	20.7	8.2	79.3
#50	9.9	10.8	90.1
#100	2.1	7.8	97.9
LBW	0.9	1.2	99.1

PREPARED BY:  
 SM, LLC Technical Service

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



Plant S02-Superior Hoover

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	95.7	%	95-100
	3/4" (19mm)	80.5	%	
	1/2" (12.5mm)	37.4	%	30-60
	3/8" (9.5mm)	20.1	%	
	#4 (4.75mm)	4.5	%	0-8
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.82	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.77	%	



Plant S02-Superior Hoover

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	95.0	%	95-100
	3/8" (9.5mm)	83.6	%	60-95
	#4 (4.75mm)	18.1	%	5-30
	#8 (2.36mm)	4.4	%	0-12
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	2.14	%	



Plant S02-Superior Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	79.8	%	65-95
	#16 (1.18mm)	64.4	%	35-75
	#30 (.6mm)	48.2	%	20-55
	#50 (.3mm)	22.9	%	10-30
	#100 (.15mm)	3.9	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.86		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.70	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: P11

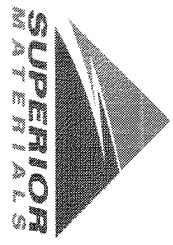
Sample Date: 4/15/24

Dates Test Represents: 4/16/2024 through 4/22/2024

Concrete Grade: S2M, 3500HP

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

MIDOT 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	71-47	Presque Isle	1600	9.79	2.62	52.5	
26A	71-47	Presque Isle	220	1.35	2.62	7.2	
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3	
Total Wt						3050	100.0

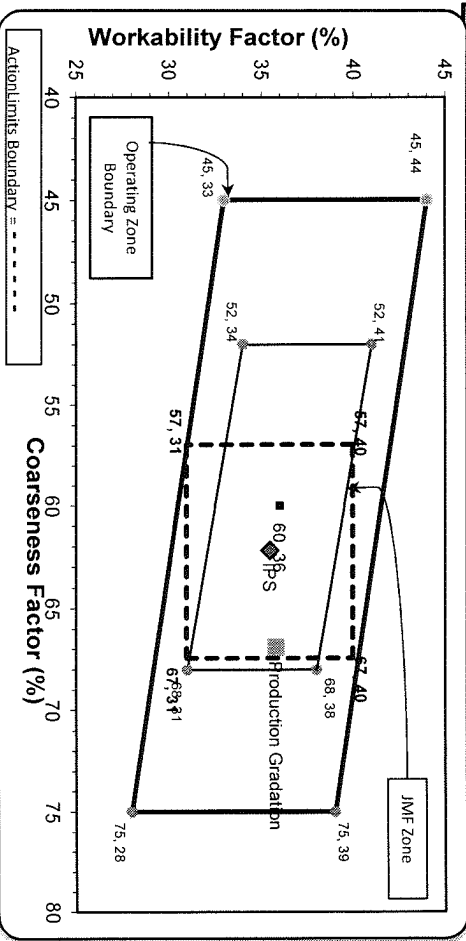
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	96.8	100.0	100.0	98.3	1.7	1.7
3/4"	78.7	100.0	100.0	88.8	9.5	11.2
1/2"	39.9	94.4	100.0	68.1	20.8	31.9
3/8"	20.4	83.3	100.0	57.0	11.0	43.0
#4	3.7	17.4	97.1	42.4	14.7	57.6
#8	2.1	4.1	85.3	35.8	6.6	64.2
#16	1.8	2.4	70.6	29.6	6.2	70.4
#30	1.8	2.1	50.8	21.6	8.0	78.4
#50	1.7	1.9	24.1	10.7	10.8	89.3
#100	1.6	1.8	7.3	3.9	6.8	96.1
LBW	1.3	1.6	1.3	1.3	2.6	98.7

<----- 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

Coarseness Factor: **67** Workability Factor: **36**



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

Coarseness Factor: **62** Workability Factor: **35**

PREPARED BY:  
 SM, LLC Technical Service

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



Plant S11-Onsite Jefferson

Product 1051-6AA LS

Period: 04/14/2024 - 04/20/2024

Name/Title Doug Storey / QC Technician

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.8	%	95-100
	3/4" (19mm)	78.7	%	
	1/2" (12.5mm)	39.9	%	30-60
	3/8" (9.5mm)	20.4	%	
	#4 (4.75mm)	3.7	%	0-8
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.46	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	2.81	%	



Plant S11-Onsite Jefferson

Product 1067-26A Mod LS

Period: 04/14/2024 - 04/20/2024

Name/Title Doug Storey / QC Technician

Report Date 04/19/2024

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)	94.4	%	95-100
	3/8" (9.5mm)	83.3	%	60-95
	#4 (4.75mm)	17.4	%	5-30
	#8 (2.36mm)	4.1	%	0-12
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.13	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.1	%	95-100
	#8 (2.36mm)	85.3	%	65-95
	#16 (1.18mm)	70.6	%	35-75
	#30 (.6mm)	50.8	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	5.63	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: 12

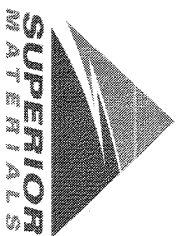
Sample Date: 4/15/24

Dates Test Represents: 4/16/2024 through 4/22/2024

Concrete Grade: S2M, 3500HP

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

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



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

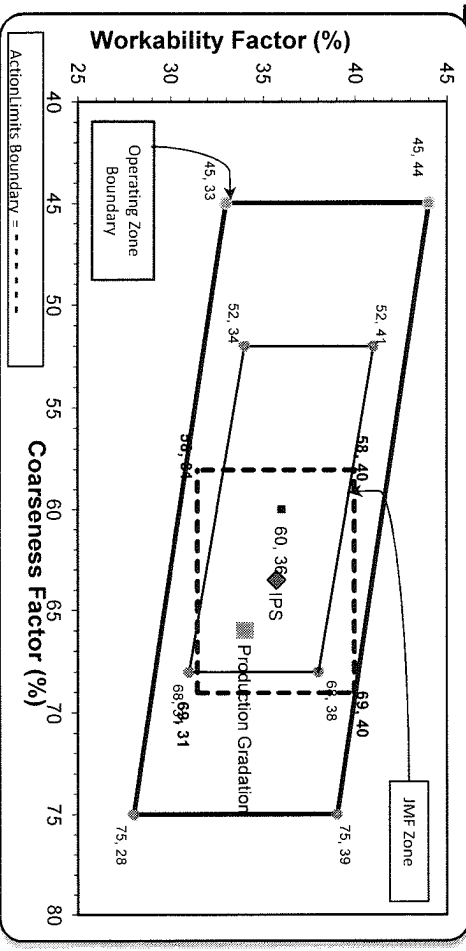
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %	
6AA	71-47	Presque Isle	1550	9.48	2.62	50.8	
26A	71-47	Presque Isle	270	1.65	2.62	8.9	
2NS	63-115	Ray Rd	1230	7.44	2.65	40.3	
Total Wt:						3050	100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	1.9	1.9
3/4"	11.6	13.5
1/2"	22.2	35.7
3/8"	7.9	43.5
#4	14.6	58.2
#8	7.8	66.0
#16	6.9	72.8
#30	6.9	79.7
#50	10.4	90.1
#100	7.6	97.7
LBW	1.3	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.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **66** Workability Factor: **34**



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"	99.2	0.8	0.8
3/4"	90.9	8.3	9.1
1/2"	71.3	19.6	28.7
3/8"	59.2	12.1	40.8
#4	41.5	17.7	58.5
#8	35.7	5.8	64.3
#16	27.9	7.9	72.1
#30	18.3	9.5	81.7
#50	7.3	11.0	92.7
#100	2.0	5.3	98.0
LBW	0.9	1.1	99.1

PREPARED BY:  
 SM, LLC Technical Service

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



Plant S12-Onsite Southfield

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.2	%	95-100
	3/4" (19mm)	73.4	%	
	1/2" (12.5mm)	30.9	%	30-60
	3/8" (9.5mm)	17.5	%	
	#4 (4.75mm)	2.8	%	0-8
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.53	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	1.08	%	



Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	93.7	%	95-100
	3/8" (9.5mm)	81.8	%	60-95
	#4 (4.75mm)	15.6	%	5-30
	#8 (2.36mm)	3.1	%	0-12
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	1.62	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 04/14/2024 - 04/20/2024

Name/Title Doug Storey / QC Technician

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.8	%	95-100
	#8 (2.36mm)	80.8	%	65-95
	#16 (1.18mm)	64.2	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	21.9	%	10-30
	#100 (.15mm)	3.2	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.86		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.15	%	

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** P-103

**Sample Date:** 4/15/24

**Dates Test Represents:** 4/16/2024 through 4/22/2024

**Concrete Grade:** S2M, 3500HP

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

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



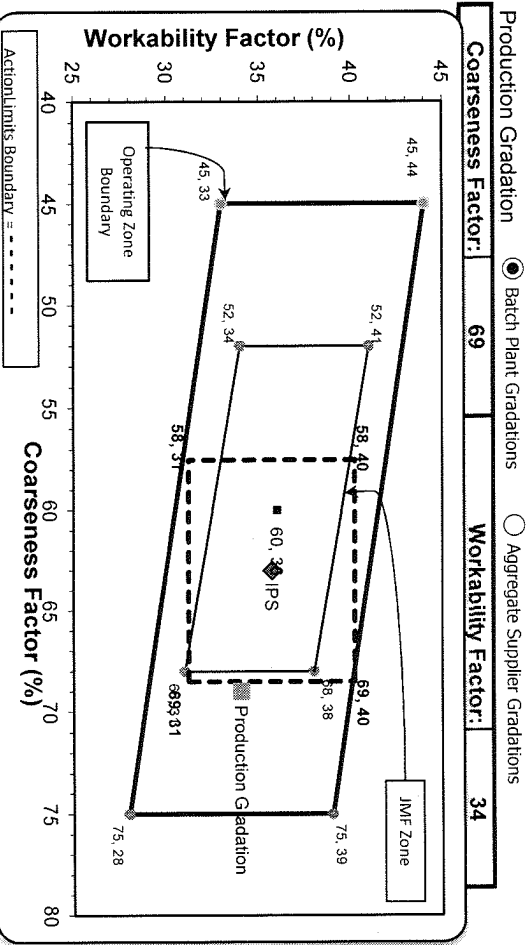
**Superior Materials, LLC**  
30701 W. 10 Mile Rd.  
Suite 500  
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %	
6AA	58-003	Stonoco	1500	8.94	2.69	48.4	
26A	58-003	Stonoco	400	2.38	2.69	12.9	
2NS	63-114	Highland	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"	97.1	100.0	100.0	98.6	1.4	1.4
3/4"	74.6	100.0	100.0	87.7	10.9	12.3
1/2"	33.0	99.7	100.0	67.5	20.2	32.5
3/8"	9.0	88.6	100.0	54.5	13.0	45.5
#4	2.3	8.6	99.3	40.7	13.8	59.3
#8	2.0	2.6	84.6	34.1	6.6	65.9
#16	1.8	2.1	66.7	27.0	7.1	73.0
#30	1.7	1.9	48.0	19.6	7.3	80.4
#50	1.6	1.7	20.5	8.9	10.7	91.1
#100	1.5	1.6	4.7	2.8	6.2	97.2
LBW	1.3	1.5	1.2	1.3	1.5	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:** 69 **Workability Factor:** 34

**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"	99.2	0.8	0.8
3/4"	90.9	8.3	9.1
1/2"	71.3	19.6	28.7
3/8"	59.5	11.8	40.5
#4	43.8	15.7	56.2
#8	35.7	8.1	64.3
#16	27.0	8.7	73.0
#30	18.6	8.4	81.4
#50	6.8	11.8	93.2
#100	1.4	5.4	98.6
LBW	0.6	0.8	99.4

PREPARED BY: SM, LLC Technical Service

Approved BY: \_\_\_\_\_



**Plant** S103-Superior Brighton

**Product** 1051-6AA LS

**Period:** 04/14/2024 - 04/20/2024

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

**Report Date** 04/19/2024

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.1	%	95-100
	3/4" (19mm)	74.6	%	
	1/2" (12.5mm)	33.0	%	30-60
	3/8" (9.5mm)	9.0	%	
	#4 (4.75mm)	2.3	%	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)	1.41	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	1.41	%	



Plant S103-Superior Brighton

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	99.7	%	95-100
	3/8" (9.5mm)	88.6	%	60-95
	#4 (4.75mm)	8.6	%	5-30
	#8 (2.36mm)	2.6	%	0-12
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	4.15	%	



Plant S103-Superior Brighton

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.3	%	95-100
	#8 (2.36mm)	84.6	%	65-95
	#16 (1.18mm)	66.7	%	35-75
	#30 (.6mm)	48.0	%	20-55
	#50 (.3mm)	20.5	%	10-30
	#100 (.15mm)	4.7	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75µm)	1.2	%	0-3
	Total Moisture	3.12	%	