

Aggregate Optimization Chart

Production Gradation Report

PLANT #: 12

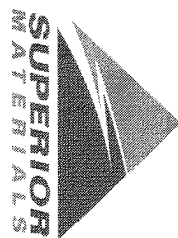
Sample Date: 9/11/23

Dates Test Represents: 9/12/2023 through 9/18/2023

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 ³	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	18.57		100.0

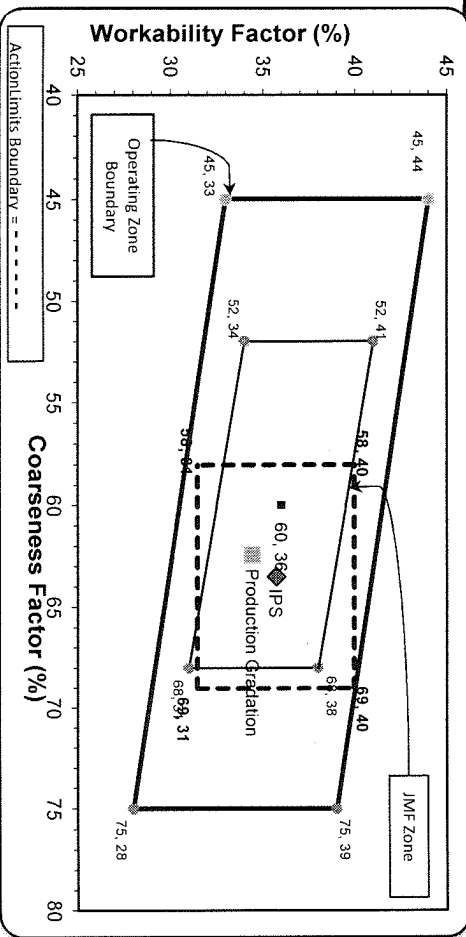
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	80.1	99.1	100.0	89.8	9.9	10.2
1/2"	42.9	95.3	100.0	70.6	19.2	29.4
3/8"	22.3	83.6	100.0	59.1	11.5	40.9
#4	4.0	23.0	96.2	42.9	16.2	57.1
#8	2.3	5.9	81.2	34.4	8.4	65.6
#16	2.1	3.2	67.4	28.5	5.9	71.5
#30	2.0	2.6	50.8	21.7	6.8	78.3
#50	1.9	2.4	24.9	11.2	10.5	88.8
#100	1.8	2.2	5.3	3.2	8.0	96.8
LBW	1.6	1.9	0.6	1.2	2.0	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: **62** Workability Factor: **34**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	64	36	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: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.4	%	95-100
	3/4" (19mm)	80.1	%	
	1/2" (12.5mm)	42.9	%	30-60
	3/8" (9.5mm)	22.3	%	
	#4 (4.75mm)	4.0	%	0-8
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.68	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	3.06	%	



Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Period: 09/10/2023 - 09/16/2023

Name/Title Doug Storey / QC Technician

Report Date 09/16/2023

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)	99.1	%	100-100
	1/2" (12.5mm)	95.3	%	95-100
	3/8" (9.5mm)	83.6	%	60-95
	#4 (4.75mm)	23.0	%	5-30
	#8 (2.36mm)	5.9	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	2.09	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 09/10/2023 - 09/16/2023

Name/Title Doug Storey / QC Technician

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.2	%	95-100
	#8 (2.36mm)	81.2	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	50.8	%	20-55
	#50 (.3mm)	24.9	%	10-30
	#100 (.15mm)	5.3	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.39	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: 14

Contractor: _____

Sample Date: 9/1/12/23

Dates Test Represents: 9/12/2023 through 9/18/2023

Concrete Grade: S2M, 3500HP

MDOT No.: _____



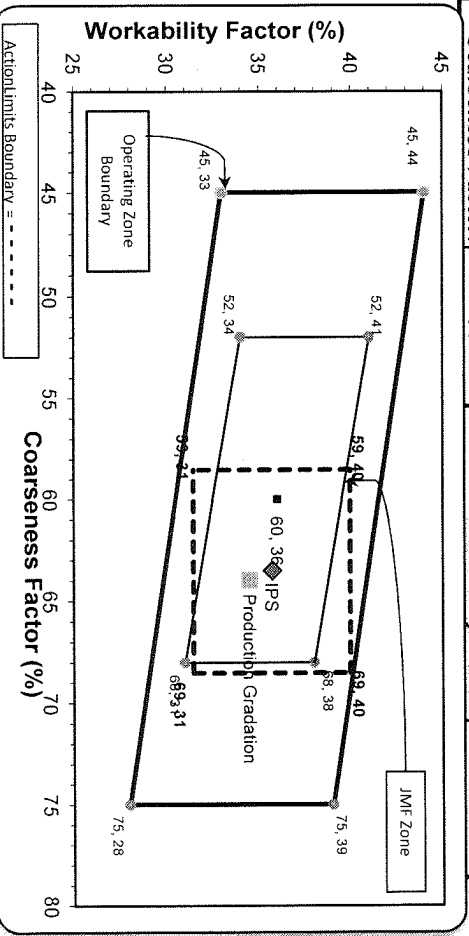
Builders Redi-Mix
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1575	9.38	2.69	50.6
26A	58-003	Stoneco	325	1.94	2.69	10.5
ZNS	19-04	Schlegel	1210	7.26	2.67	38.9
Total Wt			3110	18.58		100.0

Sieve	6AA	26A	ZNS	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"	84.2	100.0	100.0	92.0	8.0	8.0
1/2"	42.0	99.3	100.0	70.6	21.4	29.4
3/8"	19.6	88.7	100.0	58.1	12.5	41.9
#4	2.5	10.1	99.6	41.1	17.0	58.9
#8	1.5	3.1	85.9	34.5	6.6	65.5
#16	1.3	2.4	68.1	27.4	7.1	72.6
#30	1.2	2.1	49.9	20.2	7.2	79.8
#50	1.1	2.0	17.6	7.6	12.6	92.4
#100	1.1	2.0	3.4	2.1	5.5	97.9
LBW	0.8	2.0	1.0	1.0	1.1	99.0

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **64** Workability Factor: **35**



Initial Production Sample (IPS)

Sieve	Coarseness Factor: 64		Workability Factor: 36	
	Cumulative % Passing	% Retained	Cumulative % Passing	% Retained
2"	100.0	0.0	100.0	0.0
1.5"	100.0	0.0	100.0	0.0
1"	99.2	0.8	99.2	0.8
3/4"	90.9	8.3	90.9	9.1
1/2"	71.3	19.6	71.3	28.7
3/8"	59.2	12.1	59.2	40.8
#4	41.5	17.7	41.5	58.5
#8	35.7	5.8	35.7	64.3
#16	27.9	7.9	27.9	72.1
#30	18.3	9.5	18.3	81.7
#50	7.3	11.0	7.3	92.7
#100	2.0	5.3	2.0	98.0
LBW	0.9	1.1	0.9	99.1

*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 S14-Superior Lansing

Product 1051-6AA LS

Period: 09/10/2023 - 09/16/2023

Name/Title Doug Storey / QC Technician

Report Date 09/16/2023

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)	84.2	%	
	1/2" (12.5mm)	42.0	%	30-60
	3/8" (9.5mm)	19.6	%	
	#4 (4.75mm)	2.5	%	0-8
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	0.96	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	3.40	%	



Plant S14-Superior Lansing

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

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)	99.3	%	95-100
	3/8" (9.5mm)	88.7	%	60-95
	#4 (4.75mm)	10.1	%	5-30
	#8 (2.36mm)	3.1	%	0-12
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.97	%	



Plant S14-Superior Lansing

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.6	%	95-100
	#8 (2.36mm)	85.9	%	65-95
	#16 (1.18mm)	68.1	%	35-75
	#30 (.6mm)	49.9	%	20-55
	#50 (.3mm)	17.6	%	10-30
	#100 (.15mm)	3.4	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.82	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Contractor: _____

Sample Date: 9/11/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 9/12/2023 through 9/18/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
ZNS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

Sieve	6AA	26A	ZNS	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"	97.8	100.0	100.0	98.9	1.1	1.1
3/4"	79.6	100.0	100.0	90.0	9.0	10.0
1/2"	43.3	94.4	100.0	71.5	18.4	28.5
3/8"	25.5	85.5	100.0	61.8	9.7	38.2
#4	5.2	22.3	97.2	44.1	17.7	55.9
#8	2.7	5.8	85.4	36.4	7.7	63.6
#16	2.2	3.1	69.9	29.6	6.8	70.4
#30	2.1	2.5	50.3	21.6	8.0	78.4
#50	2.0	2.2	24.6	11.1	10.4	88.9
#100	1.9	2.0	7.2	4.0	7.1	96.0
LBW	1.4	1.7	0.9	1.2	2.8	98.8



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

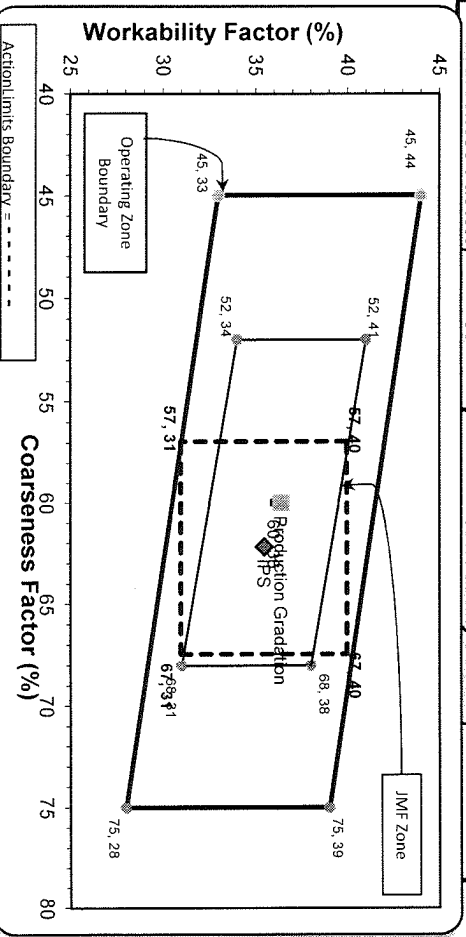
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when
 a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **60** Workability Factor: **36**

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



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

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.8	%	95-100
	3/4" (19mm)	79.6	%	
	1/2" (12.5mm)	43.3	%	30-60
	3/8" (9.5mm)	25.5	%	
	#4 (4.75mm)	5.2	%	0-8
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	2.6	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

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)	94.4	%	95-100
	3/8" (9.5mm)	85.5	%	60-95
	#4 (4.75mm)	22.3	%	5-30
	#8 (2.36mm)	5.8	%	0-12
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.7	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.2	%	95-100
	#8 (2.36mm)	85.4	%	65-95
	#16 (1.18mm)	69.9	%	35-75
	#30 (.6mm)	50.3	%	20-55
	#50 (.3mm)	24.6	%	10-30
	#100 (.15mm)	7.2	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	4.0	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

Sample Date: **9/1/1/23**

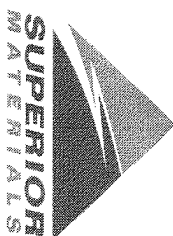
Dates Test Represents: **9/12/2023**

through **9/18/2023**

Concrete Grade: **S2M, 3500HP**

Contractor: _____

MDOT No.: _____



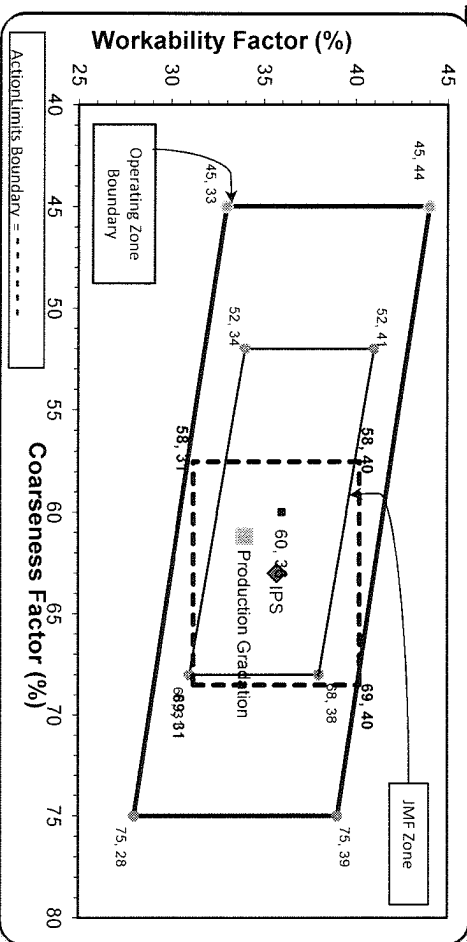
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3100	18.58		100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.3	0.3
3/4"	11.1	11.4
1/2"	19.3	30.6
3/8"	9.7	40.4
#4	17.9	58.3
#8	7.7	66.0
#16	6.6	72.6
#30	7.0	79.6
#50	9.3	88.9
#100	7.2	96.1
LBW	2.5	98.6

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **61** Workability Factor: **34**



Initial Production Sample (IPS)

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"	99.2	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

*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 S102-Superior Novi

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.5	%	95-100
	3/4" (19mm)	78.3	%	
	1/2" (12.5mm)	41.7	%	30-60
	3/8" (9.5mm)	24.4	%	
	#4 (4.75mm)	4.2	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.37	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	3.54	%	



Plant S102-Superior Novi

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

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)	99.1	%	95-100
	3/8" (9.5mm)	91.5	%	60-95
	#4 (4.75mm)	16.8	%	5-30
	#8 (2.36mm)	3.9	%	0-12
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	3.1	%	
	#200 (75µm)	3.0	%	
	Wash Loss (#200/75um)	3.0	%	0-3
	Total Moisture	5.29	%	



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.2	%	95-100
	#8 (2.36mm)	84.2	%	65-95
	#16 (1.18mm)	67.5	%	35-75
	#30 (.6mm)	49.7	%	20-55
	#50 (.3mm)	25.8	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.27	%	