Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 6/22/20

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1555	9.51	2.62	53.5
26A	71-47	Presque Isle	250	1.53	2.62	8.6
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	**2905**	**17.69**		100.0

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

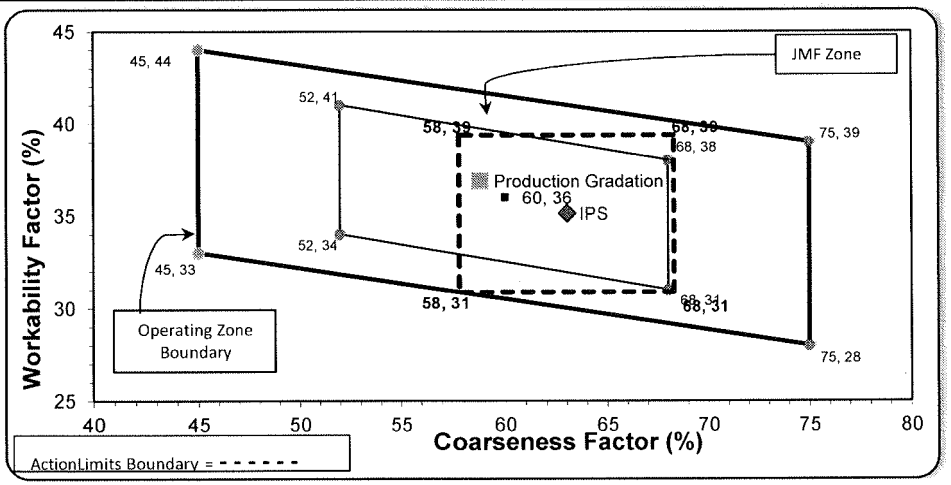
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	84.0	100.0	100.0	91.4	8.6	8.6
1/2"	52.0	96.6	100.0	74.0	17.4	26.0
3/8"	30.6	83.4	100.0	61.4	12.6	38.6
#4	6.5	29.1	97.4	42.9	18.6	57.1
#8	2.9	9.2	84.6	34.4	8.5	65.6
#16	2.3	4.0	70.0	28.1	6.3	71.9
#30	2.2	2.9	50.0	20.4	7.7	79.6
#50	2.0	2.5	20.1	8.9	11.5	91.1
#100	1.8	2.0	3.0	2.3	6.6	97.7
LBW	1.6	1.5	0.5	1.2	1.1	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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	59	Workability Factor:	34	Adjusted WF 36.9



Intial Production Sample (IPS)

Coarseness Factor:	63
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"	99.1	0.9	0.9
3/4"	90.3	8.8	9.7
1/2"	69.2	21.1	30.8
3/8"	59.1	10.1	40.9
#4	41.8	17.3	58.2
#8	35.1	6.6	64.9
#16	28.5	6.6	71.5
#30	21.2	7.3	78.8
#50	8.7	12.5	91.3
#100	1.8	7.0	98.2
LBW	0.7	1.0	99.3

PREPARED BY:
SM, LLC Technical Service

Approved By:

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	84.0	%	
	1/2" (12.5mm)	52.0	%	30-60
	3/8" (9.5mm)	30.6	%	
	#4 (4.75mm)	6.5	%	0-8
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.62	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	96.6	%	95-100
	3/8" (9.5mm)	83.4	%	60-95
	#4 (4.75mm)	29.1	%	5-30
	#8 (2.36mm)	9.2	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	2.88	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.4	%	95-100
	#8 (2.36mm)	84.6	%	65-95
	#16 (1.18mm)	70.0	%	35-75
	#30 (.6mm)	50.0	%	20-55
	#50 (.3mm)	20.1	%	10-30
	#100 (.15mm)	3.0	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.35	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-39

Sample Date: 6/22/20

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1705	10.43	2.62	58.7
26A	71-47	Presque Isle	100	0.61	2.62	3.4
2NS	44-051	Krake Willis Rd	1100	6.65	2.65	37.9
		Total Wt	**2905**	**17.69**		100.0

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

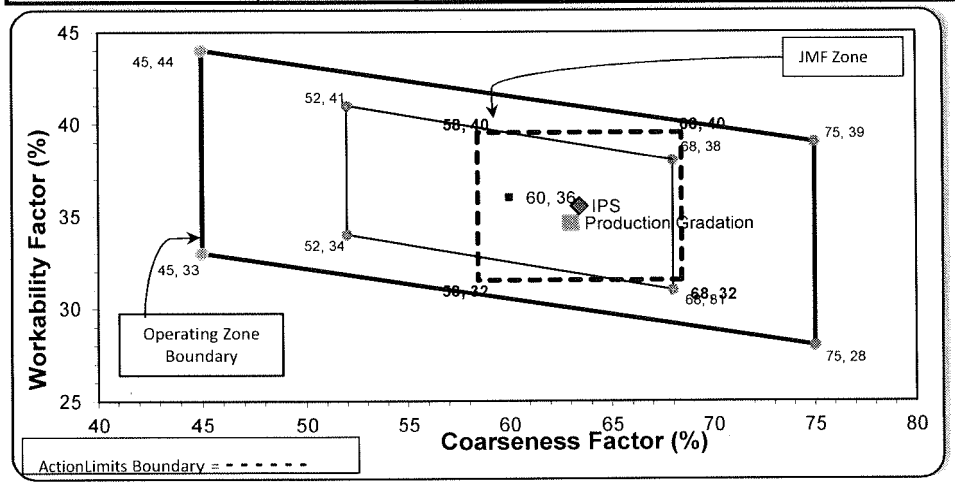
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	87.7	100.0	100.0	92.8	6.9	7.2
1/2"	52.1	96.2	100.0	71.8	21.0	28.2
3/8"	28.2	81.3	100.0	57.2	14.5	42.8
#4	5.8	19.5	95.7	40.3	16.9	59.7
#8	3.0	5.9	79.6	32.1	8.2	67.9
#16	2.5	3.2	66.6	26.8	5.3	73.2
#30	2.3	2.7	47.1	19.3	7.5	80.7
#50	2.2	2.5	25.2	10.9	8.4	89.1
#100	2.1	2.4	7.4	4.1	6.8	95.9
LBW	1.8	2.2	2.0	1.9	2.2	98.1

*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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	63	Workability Factor:	32	Adjusted WF: 34.6



Intial 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"	100.0	0.0	0.0
3/4"	89.7	10.3	10.3
1/2"	70.3	19.4	29.7
3/8"	59.1	11.2	40.9
#4	42.8	16.3	57.2
#8	35.5	7.3	64.5
#16	29.0	6.5	71.0
#30	21.2	7.7	78.8
#50	9.8	11.5	90.2
#100	3.7	6.1	96.3
LBW	1.2	2.5	98.8

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S39-Superior Sterling Heights

Product 1051-6AA LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	87.7	%	
	1/2" (12.5mm)	52.1	%	30-60
	3/8" (9.5mm)	28.2	%	
	#4 (4.75mm)	5.8	%	0-8
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.82	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	4.14	%	

SUPERIOR MATERIALS

Plant S39-Superior Sterling Heights

Product 1067-26A Mod LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	96.2	%	95-100
	3/8" (9.5mm)	81.3	%	60-95
	#4 (4.75mm)	19.5	%	5-30
	#8 (2.36mm)	5.9	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	3.58	%	

Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	79.6	%	65-95
	#16 (1.18mm)	66.6	%	35-75
	#30 (.6mm)	47.1	%	20-55
	#50 (.3mm)	25.2	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	4.45	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-101

Sample Date: 6/22/20

Concrete Grade: DM

Dates Test Represents: 6/23/2020 through 6/29/2020

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1560	9.54	2.62	53.6
26A	71-47	Presque Isle	200	1.22	2.62	6.9
2NS	75-051	Mid-Michigan	1150	6.93	2.66	39.5
		Total Wt	**2910**	**17.69**		100.0

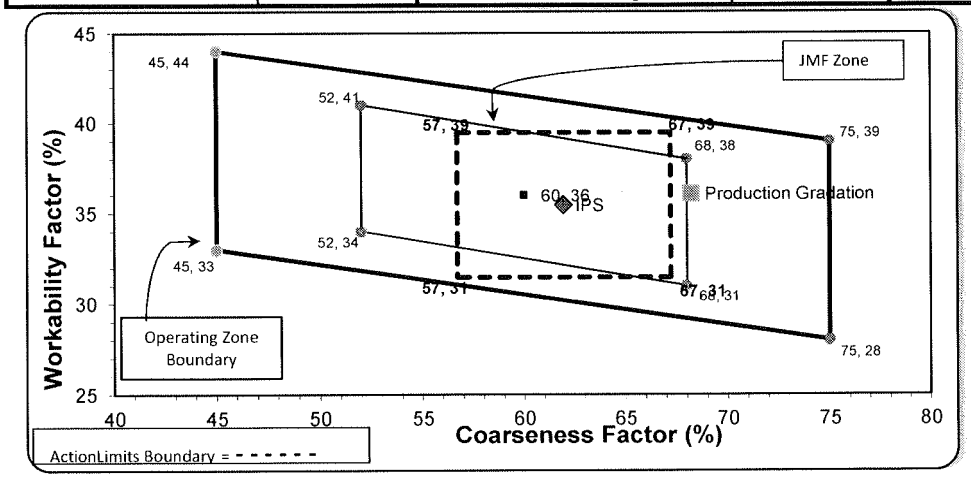
<----- Verify this number is 100%

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"	97.1	100.0	100.0	98.4	1.6	1.6
3/4"	67.3	100.0	100.0	82.5	16.0	17.5
1/2"	30.9	97.3	100.0	62.8	19.7	37.2
3/8"	16.9	88.8	100.0	54.7	8.1	45.3
#4	4.7	24.1	95.4	41.9	12.8	58.1
#8	2.7	6.9	80.1	33.6	8.3	66.4
#16	2.3	3.2	63.5	26.5	7.0	73.5
#30	2.2	2.4	49.1	20.7	5.8	79.3
#50	2.1	2.2	29.1	12.8	8.0	87.2
#100	1.9	2.0	8.7	4.6	8.2	95.4
LBW	1.6	1.9	2.2	1.9	2.7	98.1

*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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	68	Workability Factor:	34	Adjusted WF: 36.1



Initial Production Sample (IPS)

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"	95.0	5.0	5.0
1/2"	70.5	24.5	29.5
3/8"	60.0	10.5	40.0
#4	44.4	15.6	55.6
#8	35.5	9.0	64.5
#16	28.5	7.0	71.5
#30	21.5	7.0	78.5
#50	10.2	11.3	89.8
#100	3.1	7.1	96.9
LBW	1.3	1.8	98.7

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Farmington Hills, MI 48336

PREPARED BY:
SM, LLC Technical Service

Approved By:

SUPERIOR MATERIALS

Plant S101-Superior Mount Clemens

Product 1051-6AA LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	67.3	%	
	1/2" (12.5mm)	30.9	%	30-60
	3/8" (9.5mm)	16.9	%	
	#4 (4.75mm)	4.7	%	0-8
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.59	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.38	%	

SUPERIOR MATERIALS

Plant S101-Superior Mount Clemens

Product 1067-26A Mod LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	97.3	%	95-100
	3/8" (9.5mm)	88.8	%	60-95
	#4 (4.75mm)	24.1	%	5-30
	#8 (2.36mm)	6.9	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	2.84	%	

SUPERIOR MATERIALS

Plant S101-Superior Mount Clemens

Product 1022-2NS GR

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.4	%	95-100
	#8 (2.36mm)	80.1	%	65-95
	#16 (1.18mm)	63.5	%	35-75
	#30 (.6mm)	49.1	%	20-55
	#50 (.3mm)	29.1	%	10-30
	#100 (.15mm)	8.7	%	0-10
	#200 (75µm)	2.2	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	5.28	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Sample Date: 6/22/20

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.8
26A	58-003	Stoneco	305	1.82	2.69	10.3
2NS	63-114	Highland	1150	6.95	2.65	38.9
		Total Wt	**2955**	**17.71**		100.0

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

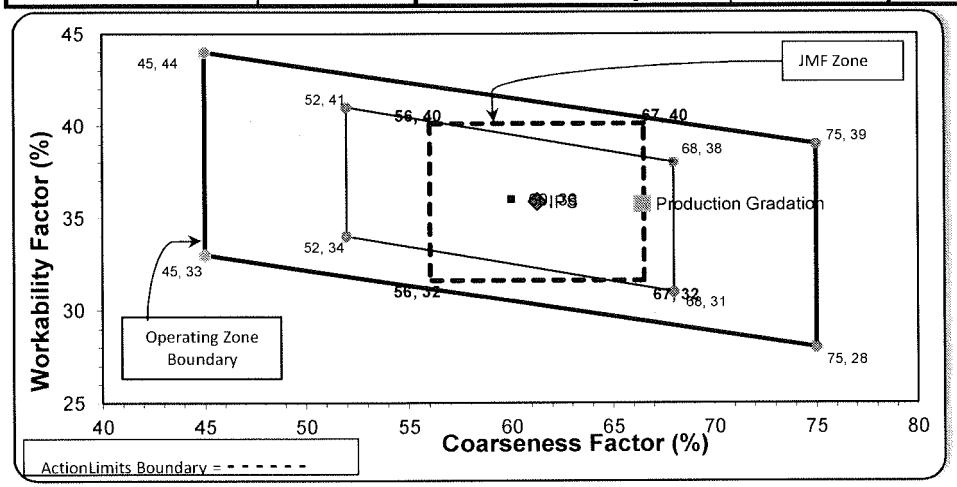
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	78.8	100.0	100.0	89.2	10.8	10.8
1/2"	36.4	99.8	100.0	67.7	21.5	32.3
3/8"	15.0	88.2	100.0	55.6	12.1	44.4
#4	3.2	15.5	98.7	41.6	14.0	58.4
#8	1.7	3.7	82.2	33.2	8.4	66.8
#16	1.3	2.3	64.5	26.0	7.2	74.0
#30	0.9	2.0	49.1	19.8	6.2	80.2
#50	0.8	1.8	22.1	9.2	10.6	90.8
#100	0.7	1.5	5.6	2.7	6.5	97.3
LBW	0.6	1.2	1.9	1.2	1.5	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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	66	Workability Factor:	33	Adjusted WF 35.7



Intial Production Sample (IPS)

Coarseness Factor:	61
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"	89.2	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

Plant S102-Superior Novi

Product 1051-6AA LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	78.8	%	
	1/2" (12.5mm)	36.4	%	30-60
	3/8" (9.5mm)	15.0	%	
	#4 (4.75mm)	3.2	%	0-8
	#8 (2.36mm)	1.7	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	0.9	%	
	#50 (.3mm)	0.8	%	
	#100 (.15mm)	0.7	%	
	#200 (75µm)	0.63	%	
	Wash Loss (#200/75um)	0.5	%	0-2
	Total Moisture	3.05	%	

SUPERIOR MATERIALS

Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

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)	99.8	%	95-100
	3/8" (9.5mm)	88.2	%	60-95
	#4 (4.75mm)	15.5	%	5-30
	#8 (2.36mm)	3.7	%	0-12
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	2.40	%	

Plant S102-Superior Novi

Product 1022-2NS GR

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.7	%	95-100
	#8 (2.36mm)	82.2	%	65-95
	#16 (1.18mm)	64.5	%	35-75
	#30 (.6mm)	49.1	%	20-55
	#50 (.3mm)	22.1	%	10-30
	#100 (.15mm)	5.6	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	5.48	%	