Aggregate Optimization Chart

Production Gradation Report

PLANT #: 12

Contractor: _____

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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

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

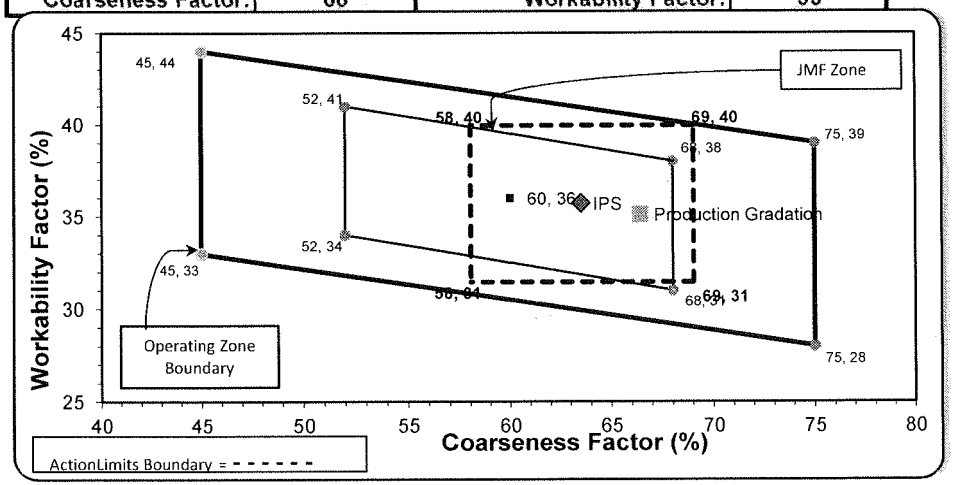
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.2	100.0	100.0	98.6	1.4	1.4
3/4"	70.9	100.0	100.0	85.2	13.4	14.8
1/2"	29.8	98.1	100.0	64.2	21.1	35.8
3/8"	16.9	90.2	100.0	56.9	7.3	43.1
#4	4.0	24.7	96.3	43.1	13.8	56.9
#8	2.8	6.1	82.2	35.1	7.9	64.9
#16	2.5	2.7	67.9	28.9	6.2	71.1
#30	2.4	2.3	52.7	22.7	6.2	77.3
#50	2.2	2.0	25.1	11.4	11.3	88.6
#100	2.0	1.8	5.7	3.5	7.9	96.5
LBW	1.6	1.6	0.6	1.2	2.3	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.

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:	35



Intial Production Sample (IPS)

Coarseness Factor:	64
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"	59.2	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:

SUPERIOR MATERIALS

Plant S12-Onsite Southfield

Product 1051-6AA LS

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.2	%	95-100
	3/4" (19mm)	70.9	%	
	1/2" (12.5mm)	29.8	%	30-60
	3/8" (9.5mm)	16.9	%	
	#4 (4.75mm)	4.0	%	0-8
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.8	%	
AASHTO T11	-#200 (75um)	1.78	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.55	%	

SUPERIOR MATERIALS

Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

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)	98.1	%	95-100
	3/8" (9.5mm)	90.2	%	60-95
	#4 (4.75mm)	24.7	%	5-30
	#8 (2.36mm)	6.1	%	0-12
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.33	%	

SUPERIOR MATERIALS

Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.3	%	95-100
	#8 (2.36mm)	82.2	%	65-95
	#16 (1.18mm)	67.9	%	35-75
	#30 (.6mm)	52.7	%	20-55
	#50 (.3mm)	25.1	%	10-30
	#100 (.15mm)	5.7	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.85	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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
		Total Wt	**3050**	**18.57**		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"	97.8	100.0	100.0	98.9	1.1	1.1
3/4"	73.9	100.0	100.0	87.2	11.8	12.8
1/2"	27.8	96.9	100.0	64.2	23.0	35.8
3/8"	13.7	86.9	100.0	56.2	8.0	43.8
#4	2.7	23.8	96.9	42.9	13.3	57.1
#8	2.1	6.6	86.2	36.5	6.4	63.5
#16	2.0	3.6	71.5	30.2	6.3	69.8
#30	1.9	3.0	52.6	22.5	7.7	77.5
#50	1.8	2.7	24.4	11.0	11.5	89.0
#100	1.7	2.6	7.0	3.9	7.1	96.1
LBW	1.3	2.2	1.3	1.4	2.5	98.6

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.

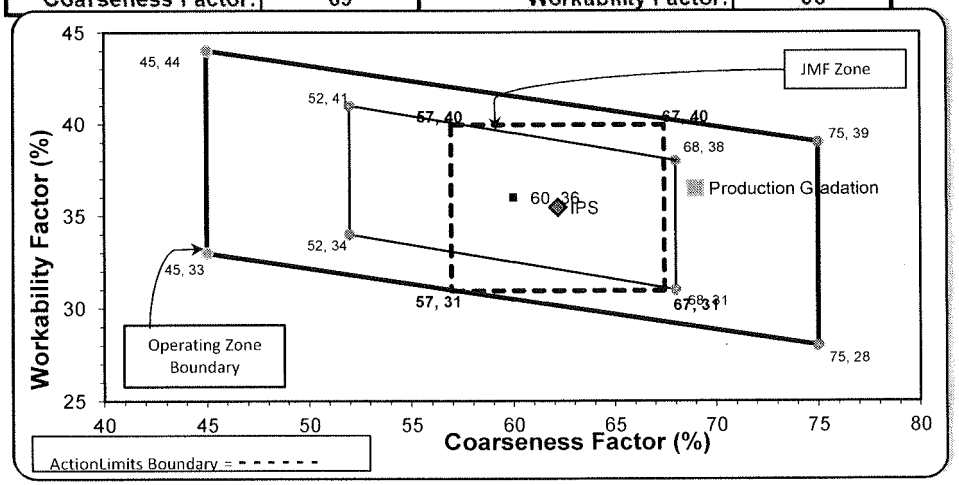
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.

*% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	69	Workability Factor:	36



Intial 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"	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:

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 1054-6AA LS PI

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

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)	73.9	%	
	1/2" (12.5mm)	27.8	%	30-60
	3/8" (9.5mm)	13.7	%	
	#4 (4.75mm)	2.7	%	0-8
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	2.1	%	

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 1067-26A Mod LS

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

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)	96.9	%	95-100
	3/8" (9.5mm)	86.9	%	60-95
	#4 (4.75mm)	23.8	%	5-30
	#8 (2.36mm)	6.6	%	0-12
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	2.3	%	

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.9	%	95-100
	#8 (2.36mm)	86.2	%	65-95
	#16 (1.18mm)	71.5	%	35-75
	#30 (.6mm)	52.6	%	20-55
	#50 (.3mm)	24.4	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.61		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	2.9	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-35

Contractor: _____

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	50.0
26A	58-003	Stoneco	350	2.09	2.69	11.3
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7
		Total Wt	**3100**	**18.58**		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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	74.7	100.0	100.0	87.4	12.4	12.7
1/2"	31.7	99.0	100.0	65.7	21.6	34.3
3/8"	15.8	86.7	100.0	56.4	9.3	43.6
#4	4.0	12.0	98.1	41.3	15.1	58.7
#8	2.6	4.3	83.5	34.1	7.2	65.9
#16	2.3	3.3	64.9	26.6	7.5	73.4
#30	2.1	2.9	45.4	19.0	7.7	81.0
#50	2.0	2.8	22.2	9.9	9.0	90.1
#100	1.9	2.7	4.8	3.1	6.8	96.9
LBW	1.6	2.6	1.4	1.6	1.5	98.4

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.

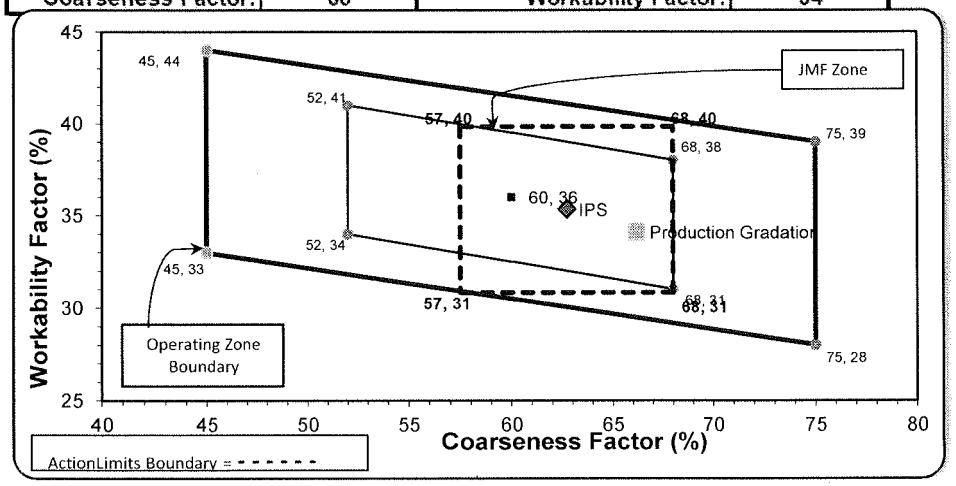
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.

*% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

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:	34



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"	99.2	0.8	0.8
3/4"	90.9	8.3	9.1
1/2"	71.3	19.6	28.7
3/8"	59.4	11.9	40.6
#4	43.0	16.5	57.0
#8	35.3	7.6	64.7
#16	28.2	7.1	71.8
#30	21.6	6.6	78.4
#50	9.1	12.5	90.9
#100	1.7	7.4	98.3
LBW	1.1	0.6	98.9

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S35-Superior Romulus

Product 1051-6AA LS

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

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)	74.7	%	
	1/2" (12.5mm)	31.7	%	30-60
	3/8" (9.5mm)	15.8	%	
	#4 (4.75mm)	4.0	%	0-8
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.69	%	
	Wash Loss (#200/75um)	1.6	%	0-2
ASTM C566	Total Moisture	2.93	%	

Plant S35-Superior Romulus

Product 1067-26A Mod LS

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

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)	99.0	%	95-100
	3/8" (9.5mm)	86.7	%	60-95
	#4 (4.75mm)	12.0	%	5-30
	#8 (2.36mm)	4.3	%	0-12
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.6	%	0-3
ASTM C566	Total Moisture	3.11	%	

Plant S35-Superior Romulus

Product 1022-2NS GR

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.1	%	95-100
	#8 (2.36mm)	83.5	%	65-95
	#16 (1.18mm)	64.9	%	35-75
	#30 (.6mm)	45.4	%	20-55
	#50 (.3mm)	22.2	%	10-30
	#100 (.15mm)	4.8	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.81		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
ASTM C566	Total Moisture	3.61	%	