

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-02

Contractor: _____

Sample Date: 11/27/23

Concrete Grade: DM, 4500HP

Dates Test Represents: 11/28/2023 through 12/4/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
GAA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
ZNS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

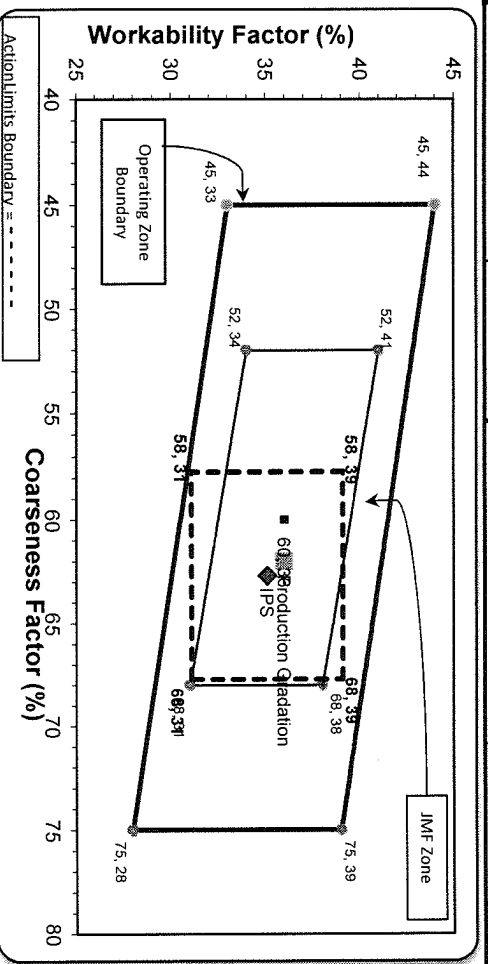
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Sieve	6AA	26A	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.1	100.0	100.0	99.6	0.4	0.4
3/4"	77.6	100.0	100.0	88.8	10.7	11.2
1/2"	37.3	93.7	100.0	68.0	20.8	32.0
3/8"	20.9	83.3	100.0	58.8	9.3	41.2
#4	4.2	20.3	95.3	42.0	16.8	58.0
#8	2.1	4.3	80.8	33.5	8.5	66.5
#16	1.7	2.2	67.5	27.8	5.7	72.2
#30	1.6	1.8	52.6	21.8	6.0	78.2
#50	1.5	1.7	28.7	12.3	9.5	87.7
#100	1.5	1.6	6.9	3.6	8.6	96.4
LBW	1.3	1.4	1.2	1.3	2.4	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	Adjusted WF
Coarseness Factor: 62	Workability Factor: 33		36.0

Initial Production Sample (IPS)	Coarseness Factor:	Workability Factor:
	63	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"	95.1	4.9	4.9
1/2"	74.6	20.5	25.4
3/8"	59.3	15.3	40.7
#4	42.1	17.2	57.9
#8	35.1	7.1	64.9
#16	29.2	5.9	70.8
#30	21.9	7.3	78.1
#50	9.6	12.4	90.4
#100	2.4	7.2	97.6
LBW	0.9	1.5	99.1

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Basic Quality Statistical Summary Report

Plant S02-Superior Hoover
Product 1051-6AA LS
Specification 6AA LS
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			100-100
1" (25mm)	1	99.1			95-100
3/4" (19mm)	1	77.6			
1/2" (12.5mm)	1	37.3			30-60
3/8" (9.5mm)	1	20.9			
#4 (4.75mm)	1	4.2			0-8
#8 (2.36mm)	1	2.1			
#16 (1.18mm)	1	1.7			
#30 (.6mm)	1	1.6			
#50 (.3mm)	1	1.5			
#100 (.15mm)	1	1.5			
#200 (75µm)	1	1.35			
Pan	1	0.00			
Wash Loss (#200/75um)	1	1.3			0-2
Total Moisture	1	2.79			



Basic Quality Statistical Summary Report

Plant S02-Superior Hoover
Product 1067-26A Mod LS
Specification 26A Mod LS Spec
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			
1" (25mm)	1	100.0			
3/4" (19mm)	1	100.0			100-100
1/2" (12.5mm)	1	93.7			95-100
3/8" (9.5mm)	1	83.3			60-95
#4 (4.75mm)	1	20.3			5-30
#8 (2.36mm)	1	4.3			0-12
#16 (1.18mm)	1	2.2			
#30 (.6mm)	1	1.8			
#50 (.3mm)	1	1.7			
#100 (.15mm)	1	1.6			
#200 (75µm)	1	1.5			
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.4			0-3
Total Moisture	1	3.36			



Basic Quality Statistical Summary Report

Plant S02-Superior Hoover
Product 1022-2NS GR
Specification 2NS GR Spec
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	95.3			95-100
#8 (2.36mm)	1	80.8			65-95
#16 (1.18mm)	1	67.5			35-75
#30 (.6mm)	1	52.6		40-50	20-55
#50 (.3mm)	1	28.7			10-30
#100 (.15mm)	1	6.9			0-10
#200 (75µm)	1	1.6			
Pan	1	0.0			
FM	1	2.68		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	1.2			0-3
Total Moisture	1	5.54			

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

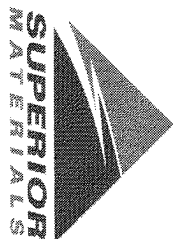
Contractor: _____

Sample Date: 1/12/23

Concrete Grade: DM, 450HP

Dates Test Represents: 1/12/2023 through 12/4/2023

MDOT No.: _____



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

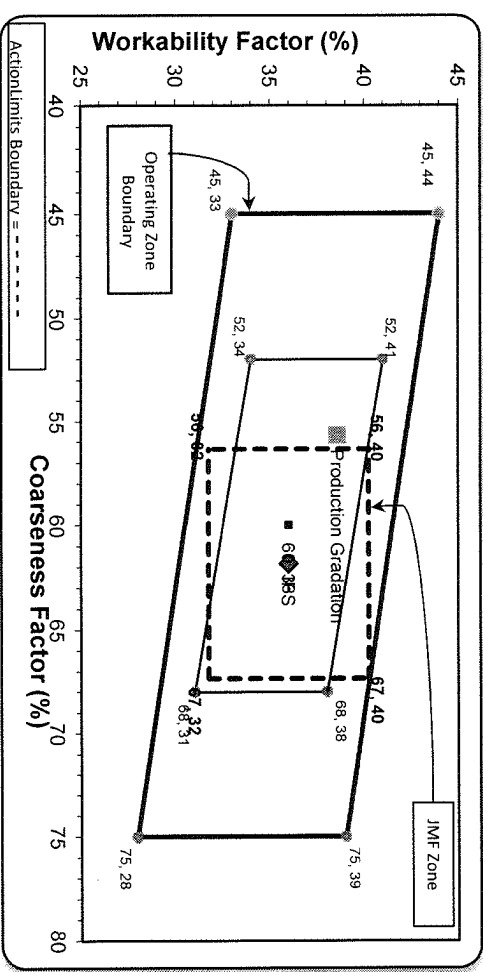
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
GAA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
ZNS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

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"	97.2	100.0	100.0	98.6	1.4	1.4
3/4"	86.0	100.0	100.0	93.0	5.6	7.0
1/2"	50.4	94.7	100.0	74.6	18.4	25.4
3/8"	32.0	85.1	100.0	64.4	10.2	35.6
#4	5.2	23.0	96.2	43.1	21.3	56.9
#8	2.9	5.3	86.1	36.1	7.0	63.9
#16	2.6	3.0	72.3	30.2	5.9	69.8
#30	2.4	2.6	52.9	22.4	7.8	77.6
#50	2.3	2.4	25.8	11.6	10.8	88.4
#100	2.2	2.3	8.0	4.5	7.1	95.5
LBW	1.8	2.1	1.7	1.8	2.7	98.2

*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: 56 Workability Factor: 36 Adjusted WF: 38.6



Sieve	Initial Production Sample (IPS)	Coarseness Factor:	Workability Factor:	Adjusted WF
2"	100.0	62	36	38.6
1.5"	100.0			
1"	100.0			
3/4"	95.0			
1/2"	72.3			
3/8"	60.4			
#4	42.6			
#8	36.0			
#16	29.5			
#30	20.3			
#50	9.5			
#100	3.4			
LBW	1.3			

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Basic Quality Statistical Summary Report

Plant 958-JMT
 Product 1054-6AA LS PI
 Specification 6AA LS PI Spec
 Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			100-100
1" (25mm)	1	97.2			95-100
3/4" (19mm)	1	86.0			
1/2" (12.5mm)	1	50.4			30-60
3/8" (9.5mm)	1	32.0			
#4 (4.75mm)	1	5.2			0-8
#8 (2.36mm)	1	2.9			
#16 (1.18mm)	1	2.6			
#30 (.6mm)	1	2.4			
#50 (.3mm)	1	2.3			
#100 (.15mm)	1	2.2			
#200 (75µm)	1	1.9			
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.8			0-2

Basic Quality Statistical Summary Report

Plant 958-JMT
Product 1067-26A Mod LS
Specification 26A Mod LS Spec
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			
1" (25mm)	1	100.0			
3/4" (19mm)	1	100.0			100-100
1/2" (12.5mm)	1	94.7			95-100
3/8" (9.5mm)	1	85.1			60-95
#4 (4.75mm)	1	23.0			5-30
#8 (2.36mm)	1	5.3			0-12
#16 (1.18mm)	1	3.0			
#30 (.6mm)	1	2.6			
#50 (.3mm)	1	2.4			
#100 (.15mm)	1	2.3			
#200 (75µm)	1	2.2			
Pan	1	0.0			
Wash Loss (#200/75µm)	1	2.1			0-3

Basic Quality Statistical Summary Report

Plant 958-JMT
Product 1022-2NS GR - Smelter Bay
Specification 2NS GR Spec
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	96.2			95-100
#8 (2.36mm)	1	86.1			65-95
#16 (1.18mm)	1	72.3			35-75
#30 (.6mm)	1	52.9			20-55
#50 (.3mm)	1	25.8		18-28	10-30
#100 (.15mm)	1	8.0			0-10
#200 (75µm)	1	2.0			
Pan	1	0.0			
FM	1	2.59		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	1.7			0-3

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-103**

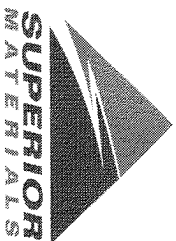
Contractor: _____

Sample Date: **1/12/23**

Concrete Grade: **DM, 4500HP**

Dates Test Represents: **1/12/28/2023** through **12/4/2023**

MDOT No.: _____



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

Aggr. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stonoco	1650	9.83	2.69	55.9
26A	58-003	Stonoco	150	0.89	2.69	5.1
ZNS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

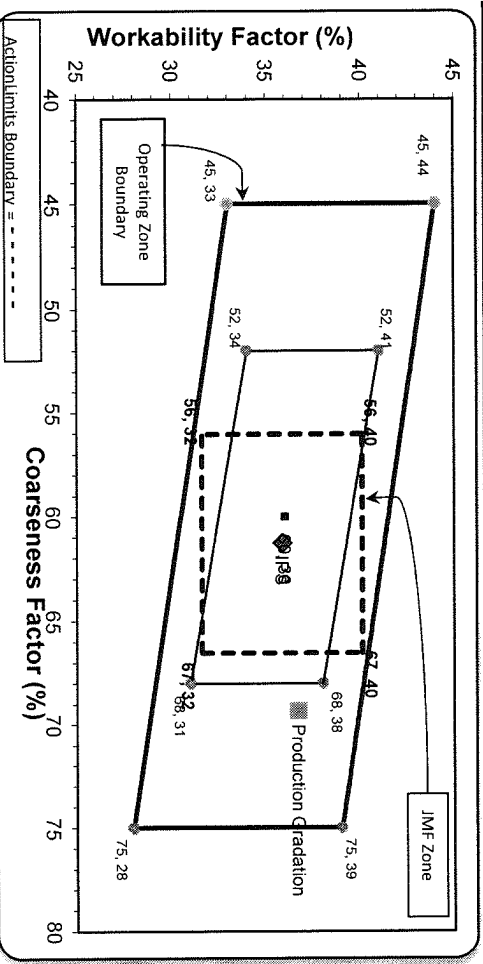
Sieve	6AA	26A	ZNS	Cumulative % Passing
2"	100.0	100.0	100.0	100.0
1.5"	100.0	100.0	100.0	100.0
1"	98.8	100.0	100.0	99.3
3/4"	77.4	100.0	100.0	87.4
1/2"	35.6	99.5	100.0	64.0
3/8"	19.4	89.8	100.0	54.4
#4	3.3	11.7	95.5	39.7
#8	1.5	4.7	85.0	34.2
#16	1.2	3.5	65.3	26.3
#30	1.1	3.0	44.0	17.9
#50	1.0	2.5	16.0	6.9
#100	1.0	2.2	2.7	1.7
LBW	0.8	2.0	0.7	0.8

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	69	Workability Factor:	34	Adjusted WF:	36.7
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Initial Production Sample (IPS)

Coarseness Factor:	61
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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

*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: _____



Basic Quality Statistical Summary Report

Plant S103-Superior Brighton
Product 1051-6AA LS
Specification 6AA LS
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			100-100
1" (25mm)	1	98.8			95-100
3/4" (19mm)	1	77.4			
1/2" (12.5mm)	1	35.6			30-60
3/8" (9.5mm)	1	19.4			
#4 (4.75mm)	1	3.3			0-8
#8 (2.36mm)	1	1.5			
#16 (1.18mm)	1	1.2			
#30 (.6mm)	1	1.1			
#50 (.3mm)	1	1.0			
#100 (.15mm)	1	1.0			
#200 (75µm)	1	0.94			
Pan	1	0.00			
FM	1	2.92			
Wash Loss (#200/75µm)	1	0.8			0-2



Basic Quality Statistical Summary Report

Plant S103-Superior Brighton
Product 1067-26A Mod LS
Specification 26A Mod LS Spec
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			
1" (25mm)	1	100.0			
3/4" (19mm)	1	100.0			100-100
1/2" (12.5mm)	1	99.5			95-100
3/8" (9.5mm)	1	89.8			60-95
#4 (4.75mm)	1	11.7			5-30
#8 (2.36mm)	1	4.7			0-12
#16 (1.18mm)	1	3.5			
#30 (.6mm)	1	3.0			
#50 (.3mm)	1	2.5			
#100 (.15mm)	1	2.2			
#200 (75µm)	1	2.0			
Pan	1	0.0			
FM	1	2.92			
Wash Loss (#200/75um)	1	2.0			0-3



Basic Quality Statistical Summary Report

Plant S103-Superior Brighton
Product 1022-2NS GR
Specification 2NS GR Spec
Period 11/26/2023 - 12/02/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	95.5			95-100
#8 (2.36mm)	1	85.0			65-95
#16 (1.18mm)	1	65.3			35-75
#30 (.6mm)	1	44.0		40-50	20-55
#50 (.3mm)	1	16.0			10-30
#100 (.15mm)	1	2.7			0-10
#200 (75µm)	1	0.7			
Pan	1	0.0			
FM	1	2.92		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	0.7			0-3