Aggregate Optimization Chart

Production Gradation Report

PLANT #: 12

Contractor: _____

Sample Date: 11/6/23

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 11/7/2023 through 11/13/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	**2905**	**17.69**		100.0

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

Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
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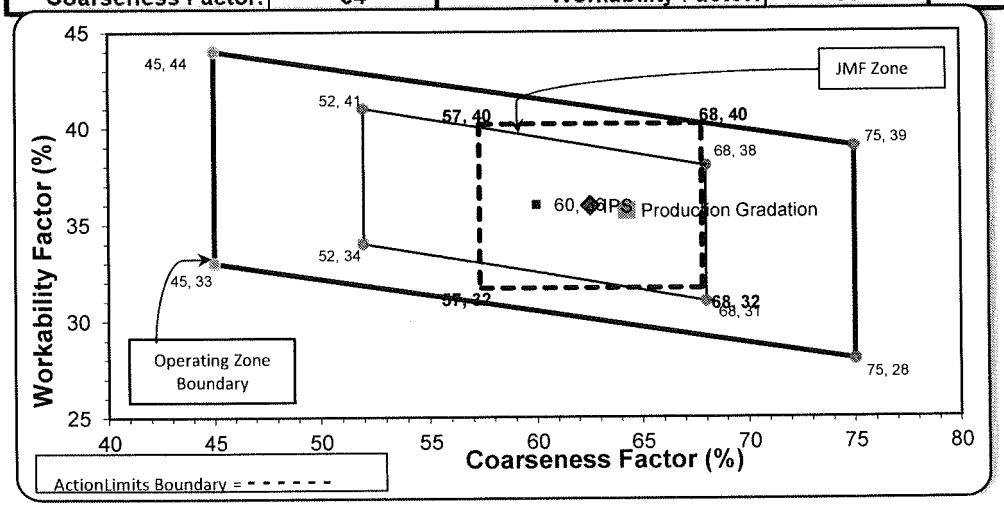
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	78.6	100.0	100.0	89.3	10.7	10.7
1/2"	32.2	97.6	100.0	65.9	23.4	34.1
3/8"	15.9	90.8	100.0	57.1	8.8	42.9
#4	2.8	29.3	97.1	42.9	14.1	57.1
#8	1.8	7.8	79.5	33.2	9.7	66.8
#16	1.7	3.5	63.3	26.3	6.9	73.7
#30	1.6	2.7	47.3	19.8	6.5	80.2
#50	1.6	2.4	22.9	10.1	9.7	89.9
#100	1.5	2.2	4.9	2.9	7.2	97.1
LBW	1.2	2.0	0.5	1.0	1.9	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:	64	Workability Factor:	33	Adjusted WF	35.7



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"	99.3	0.7	0.7
3/4"	89.0	10.3	11.0
1/2"	70.3	18.7	29.7
3/8"	59.9	10.4	40.1
#4	41.9	18.0	58.1
#8	35.9	6.0	64.1
#16	27.8	8.2	72.2
#30	18.9	8.8	81.1
#50	6.3	12.6	93.7
#100	1.7	4.6	98.3
LBW	1.0	0.7	99.0

Approved By:

PREPARED BY:
SM, LLC Technical Service

Basic Statistical Summary Report

Plant S12-Onsite Southfield
Product 1051-6AA LS
Specification 6AA LS
Period 11/05/2023 - 11/11/2023

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	100.0			95-100
3/4" (19mm)	1	78.6			
1/2" (12.5mm)	1	32.2			30-60
3/8" (9.5mm)	1	15.9			
#4 (4.75mm)	1	2.8			0-8
#8 (2.36mm)	1	1.8			
#16 (1.18mm)	1	1.7			
#30 (.6mm)	1	1.6			
#50 (.3mm)	1	1.6			
#100 (.15mm)	1	1.5			
#200 (75µm)	1	1.37			
Pan	1	0.00			
Wash Loss (#200/75um)	1	1.2			0-2
Total Moisture	1	3.76			

Basic Statistical Summary Report

Plant S12-Onsite Southfield
Product 1067-26A Mod LS
Specification 26A Mod LS Spec
Period 11/05/2023 - 11/11/2023

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	97.6			95-100
3/8" (9.5mm)	1	90.8			60-95
#4 (4.75mm)	1	29.3			5-30
#8 (2.36mm)	1	7.8			0-12
#16 (1.18mm)	1	3.5			
#30 (.6mm)	1	2.7			
#50 (.3mm)	1	2.4			
#100 (.15mm)	1	2.2			
#200 (75µm)	1	2.0			
Pan	1	0.0			
Wash Loss (#200/75um)	1	2.0			0-3
Total Moisture	1	3.25			

Basic Statistical Summary Report

Plant S12-Onsite Southfield
Product 1022-2NS GR
Specification 2NS GR Spec
Period 11/05/2023 - 11/11/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	97.1			95-100
#8 (2.36mm)	1	79.5			65-95
#16 (1.18mm)	1	63.3			35-75
#30 (.6mm)	1	47.3		40-50	20-55
#50 (.3mm)	1	22.9			10-30
#100 (.15mm)	1	4.9			0-10
#200 (75µm)	1	0.5			
Pan	1	0.0			
FM	1	2.85		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	0.5			0-3
Total Moisture	1	4.33			

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 11/6/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 11/7/2023 through 11/13/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	**2905**	**17.69**		100.0

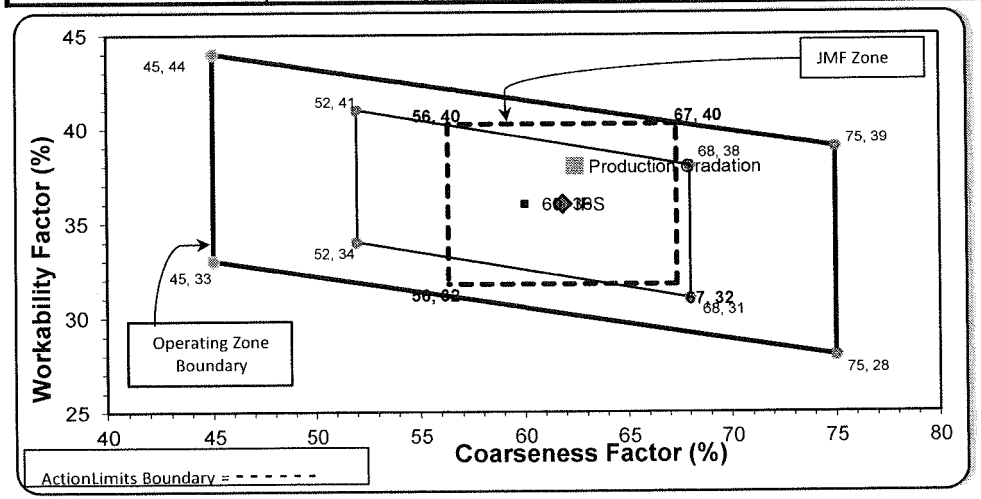
<----- Verify this number is 100%

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"	97.6	100.0	100.0	98.8	1.2	1.2
3/4"	75.5	100.0	100.0	87.7	11.1	12.3
1/2"	34.6	97.3	100.0	67.0	20.8	33.0
3/8"	22.1	87.8	100.0	59.7	7.2	40.3
#4	4.8	22.1	95.9	42.7	17.1	57.3
#8	2.8	4.2	85.0	35.5	7.2	64.5
#16	2.6	2.2	70.9	29.6	5.9	70.4
#30	2.5	1.9	51.7	21.9	7.7	78.1
#50	2.4	1.8	25.6	11.5	10.4	88.5
#100	2.3	1.7	7.7	4.4	7.1	95.6
LBW	1.8	1.6	1.8	1.8	2.6	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:	62	Workability Factor:	35	Adjusted WF: 38.0



Intial Production Sample (IPS)

Coarseness Factor:	62
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"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

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PREPARED BY:
SM, LLC Technical Service

Approved By:

Edw. C. Levy Co.

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Basic Statistical Summary Report

Plant 958-JMT
Product 1054-6AA LS PI
Specification 6AA LS PI Spec
Period 11/05/2023 - 11/11/2023

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	97.6			95-100
3/4" (19mm)	1	75.5			
1/2" (12.5mm)	1	34.6			30-60
3/8" (9.5mm)	1	22.1			
#4 (4.75mm)	1	4.8			0-8
#8 (2.36mm)	1	2.8			
#16 (1.18mm)	1	2.6			
#30 (.6mm)	1	2.5			
#50 (.3mm)	1	2.4			
#100 (.15mm)	1	2.3			
#200 (75µm)	1	2.0			
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.8			0-2
Total Moisture	1	3.6			

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Basic Statistical Summary Report

Plant 958-JMT
Product 1067-26A Mod LS
Specification 26A Mod LS Spec
Period 11/05/2023 - 11/11/2023

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	97.3			95-100
3/8" (9.5mm)	1	87.8			60-95
#4 (4.75mm)	1	22.1			5-30
#8 (2.36mm)	1	4.2			0-12
#16 (1.18mm)	1	2.2			
#30 (.6mm)	1	1.9			
#50 (.3mm)	1	1.8			
#100 (.15mm)	1	1.7			
#200 (75µm)	1	1.6			
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.6			0-3
Total Moisture	1	4.2			

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Basic Statistical Summary Report

Plant 958-JMT
Product 1022-2NS GR - Smelter Bay
Specification 2NS GR Spec
Period 11/05/2023 - 11/11/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	95.9			95-100
#8 (2.36mm)	1	85.0			65-95
#16 (1.18mm)	1	70.9			35-75
#30 (.6mm)	1	51.7			20-55
#50 (.3mm)	1	25.6		18-28	10-30
#100 (.15mm)	1	7.7			0-10
#200 (75µm)	1	2.1			
Pan	1	0.0			
FM	1	2.63		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	1.8			0-3
Total Moisture	1	4.6			

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Sample Date: 11/6/23

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 11/7/2023 through 11/13/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	46.6
26A	58-003	Stoneco	425	2.53	2.69	14.4
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	**2950**	**17.68**		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"	69.2	100.0	100.0	85.6	14.4	14.4
1/2"	26.5	99.0	100.0	65.6	20.0	34.4
3/8"	13.3	86.6	100.0	57.7	7.9	42.3
#4	3.2	11.2	97.8	41.2	16.4	58.8
#8	2.2	3.7	82.5	33.7	7.5	66.3
#16	2.0	2.8	63.2	26.0	7.7	74.0
#30	1.8	2.5	42.8	17.9	8.1	82.1
#50	1.7	2.4	16.5	7.6	10.3	92.4
#100	1.6	2.3	2.7	2.1	5.4	97.9
LBW	1.4	2.2	0.5	1.2	1.0	98.8

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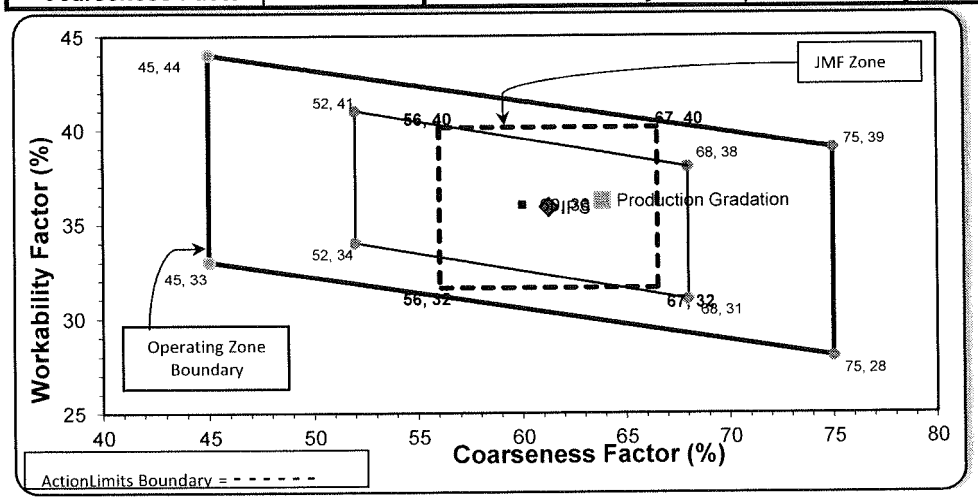
Farmington Hills, MI 48336

*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

Coarseness Factor:	64	Workability Factor:	34	Adjusted WF: 36.2



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

Approved By:

PREPARED BY:
SM, LLC Technical Service

Basic Statistical Summary Report

Plant S102-Superior Novi
Product 1051-6AA LS
Specification 6AA LS
Period 11/05/2023 - 11/11/2023

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	100.0			95-100
3/4" (19mm)	1	69.2			
1/2" (12.5mm)	1	26.5			30-60
3/8" (9.5mm)	1	13.3			
#4 (4.75mm)	1	3.2			0-8
#8 (2.36mm)	1	2.2			
#16 (1.18mm)	1	2.0			
#30 (.6mm)	1	1.8			
#50 (.3mm)	1	1.7			
#100 (.15mm)	1	1.6			
#200 (75µm)	1	1.49			
Pan	1	0.00			
Wash Loss (#200/75um)	1	1.4			0-2
Total Moisture	1	3.30			

Basic Statistical Summary Report

Plant S102-Superior Novi
Product 1067-26A Mod LS
Specification 26A Mod LS Spec
Period 11/05/2023 - 11/11/2023

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	99.0			95-100
3/8" (9.5mm)	1	86.6			60-95
#4 (4.75mm)	1	11.2			5-30
#8 (2.36mm)	1	3.7			0-12
#16 (1.18mm)	1	2.8			
#30 (.6mm)	1	2.5			
#50 (.3mm)	1	2.4			
#100 (.15mm)	1	2.3			
#200 (75µm)	1	2.2			
Pan	1	0.0			
Wash Loss (#200/75um)	1	2.2			0-3
Total Moisture	1	4.36			

Basic Statistical Summary Report

Plant S102-Superior Novi
Product 1022-2NS GR
Specification 2NS GR Spec
Period 11/05/2023 - 11/11/2023

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	97.8			95-100
#8 (2.36mm)	1	82.5			65-95
#16 (1.18mm)	1	63.2			35-75
#30 (.6mm)	1	42.8		40-50	20-55
#50 (.3mm)	1	16.5			10-30
#100 (.15mm)	1	2.7			0-10
#200 (75µm)	1	0.5			
Pan	1	0.0			
FM	1	2.84		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	0.5			0-3
Total Moisture	1	4.00			