

# Aggregate Optimization Chart

**PLANT #:** **P-102**

Sample Date: 4/3/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/4/2023 through 4/10/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1570	9.35	2.69	50.6
26A	58-003	Stoneco	330	1.97	2.69	10.6
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7
<b>Total Wt</b>			<b>3100</b>	<b>18.58</b>		<b>100.0</b>

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



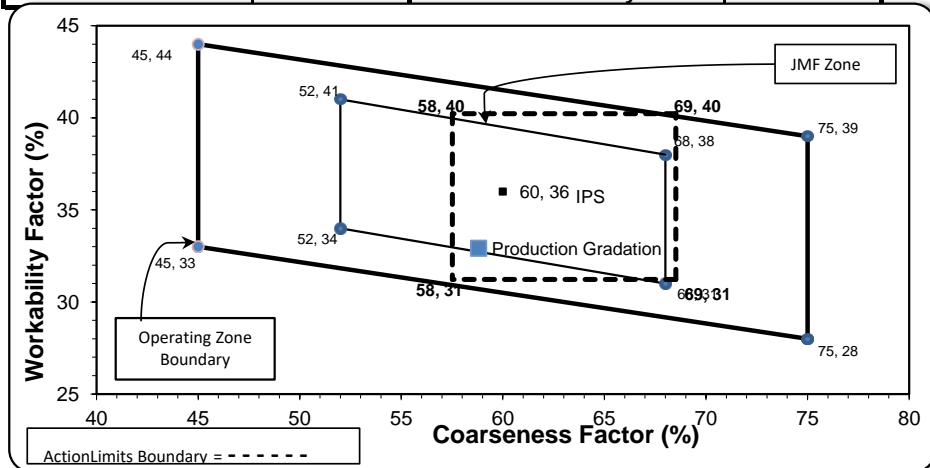
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

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"	88.1	100.0	100.0	94.0	6.0	6.0
1/2"	46.8	100.0	100.0	73.1	20.9	26.9
3/8"	24.3	89.6	100.0	60.6	12.5	39.4
#4	3.0	12.4	96.8	40.3	20.2	59.7
#8	1.3	3.4	82.4	32.9	7.4	67.1
#16	0.7	2.2	66.4	26.3	6.6	73.7
#30	0.6	1.8	48.8	19.4	6.9	80.6
#50	0.6	1.7	23.5	9.6	9.8	90.4
#100	0.6	1.6	6.5	3.0	6.6	97.0
LBW	0.8	1.4	1.3	1.1	1.9	98.9

\*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

<b>Coarseness Factor:</b>	<b>59</b>	<b>Workability Factor:</b>	<b>33</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>63</b>
<b>Workability Factor:</b>	<b>36</b>

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

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** 12

Sample Date: 4/3/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/4/2023 through 4/10/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1520	9.30	2.62	49.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
2NS	63-115	Ray Rd	1230	7.44	2.65	40.3
<b>Total Wt</b>			<b>3050</b>	<b>18.57</b>		<b>100.0</b>

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



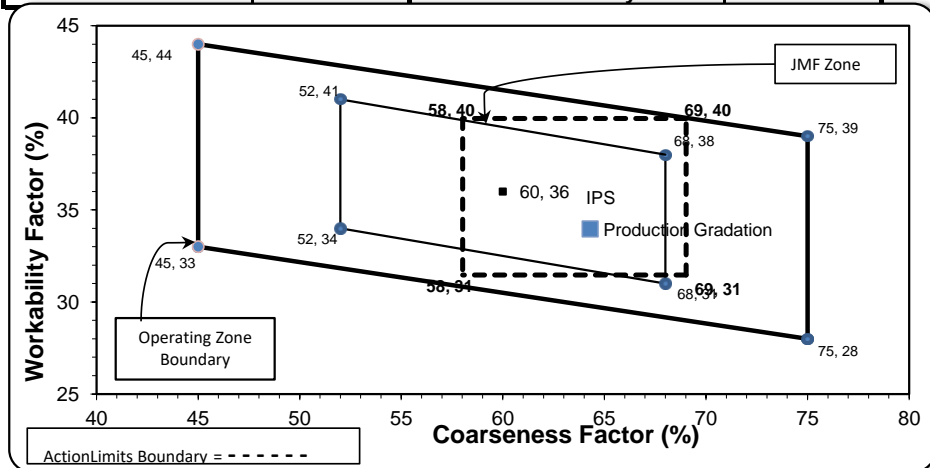
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.9	100.0	100.0	99.0	1.0	1.0
3/4"	72.2	100.0	100.0	86.1	12.8	13.9
1/2"	32.1	95.3	100.0	65.7	20.4	34.3
3/8"	17.9	84.4	100.0	57.6	8.1	42.4
#4	2.6	17.3	97.1	42.2	15.4	57.8
#8	1.7	4.7	81.0	34.0	8.2	66.0
#16	1.5	2.4	65.8	27.5	6.5	72.5
#30	1.5	1.9	50.4	21.3	6.3	78.7
#50	1.4	1.8	26.0	11.4	9.9	88.6
#100	1.3	1.7	5.0	2.8	8.5	97.2
LBW	1.2	1.5	0.6	1.0	1.8	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 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:** 64      **Workability Factor:** 34



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

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Approved By:

# Aggregate Optimization Chart

**PLANT #:** **P-32**

Sample Date: 4/3/23

Concrete Grade: **S2M, 3500HP**

Contractor: \_\_\_\_\_

Dates Test Represents: 4/4/2023 through 4/10/2023

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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
<b>Total Wt</b>			<b>3050</b>	<b>18.57</b>		<b>100.0</b>

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



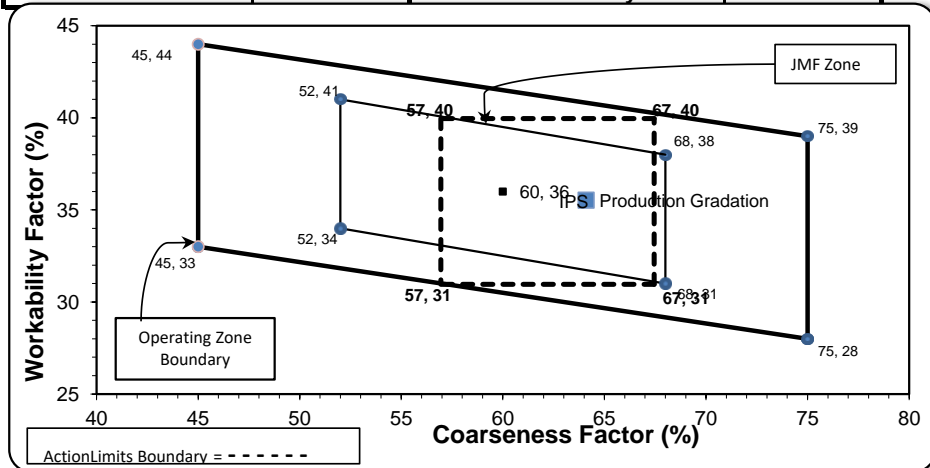
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	96.9	100.0	100.0	98.5	1.5	1.5
3/4"	72.4	100.0	100.0	86.4	12.0	13.6
1/2"	33.4	95.3	100.0	66.8	19.7	33.2
3/8"	19.3	84.4	100.0	58.7	8.1	41.3
#4	2.6	17.3	96.7	42.1	16.6	57.9
#8	1.7	4.7	84.8	35.5	6.6	64.5
#16	1.5	2.4	69.8	29.1	6.4	70.9
#30	1.5	1.9	50.8	21.4	7.7	78.6
#50	1.4	1.8	24.8	10.9	10.5	89.1
#100	1.3	1.7	6.8	3.6	7.3	96.4
LBW	1.1	1.5	1.2	1.2	2.4	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.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **64**      **Workability Factor:** **36**



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"	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

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