

# Aggregate Optimization Chart

**PLANT #:** **P-101**

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

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

Dates Test Represents: 7/25/2023 through 7/31/2023

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	75-051	Mid Michigan	1200	7.23	2.66	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.67</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	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	97.9	2.1	2.1
1"	34.6	100.0	100.0	77.2	20.7	22.8
3/4"	8.8	98.5	100.0	67.8	9.4	32.2
1/2"	3.2	83.2	100.0	61.9	5.9	38.1
3/8"	3.0	63.7	100.0	56.7	5.2	43.3
#4	2.5	17.3	96.9	43.3	13.5	56.7
#8	2.4	4.5	82.8	34.4	8.9	65.6
#16	2.4	2.7	68.6	28.4	6.0	71.6
#30	2.3	2.3	52.3	21.8	6.5	78.2
#50	2.2	2.1	25.3	11.2	10.6	88.8
#100	2.0	1.9	6.3	3.7	7.5	96.3
LBW	1.6	1.7	1.1	1.4	2.2	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 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

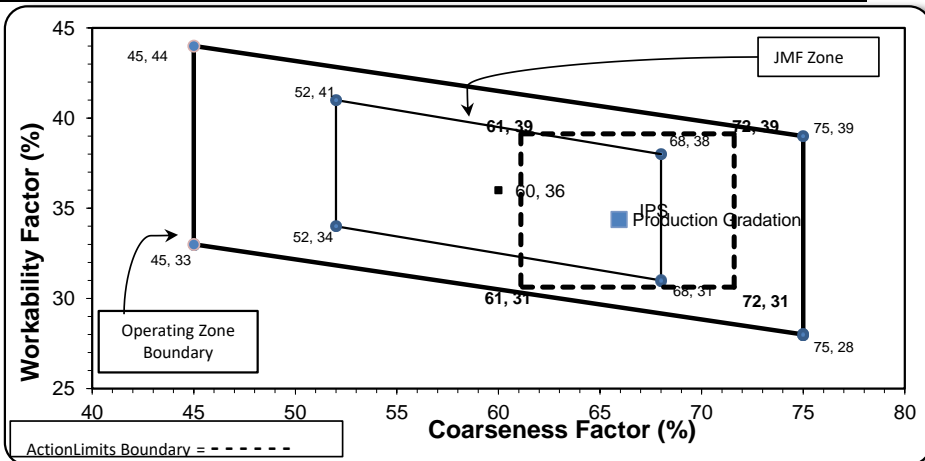
**Coarseness Factor:** **66**      **Workability Factor:** **34**

Initial Production Sample (IPS)

**Coarseness Factor:** **66**

**Workability Factor:** **35**

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	84.3	15.3	15.7
3/4"	74.8	9.6	25.2
1/2"	64.3	10.4	35.7
3/8"	56.8	7.5	43.2
#4	43.0	13.8	57.0
#8	34.9	8.1	65.1
#16	26.4	8.5	73.6
#30	19.9	6.5	80.1
#50	10.4	9.5	89.6
#100	3.4	7.0	96.6
LBW	1.2	2.2	98.8



PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

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

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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



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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.5
<b>Total Wt</b>			<b>3120</b>	<b>18.70</b>		<b>100.0</b>

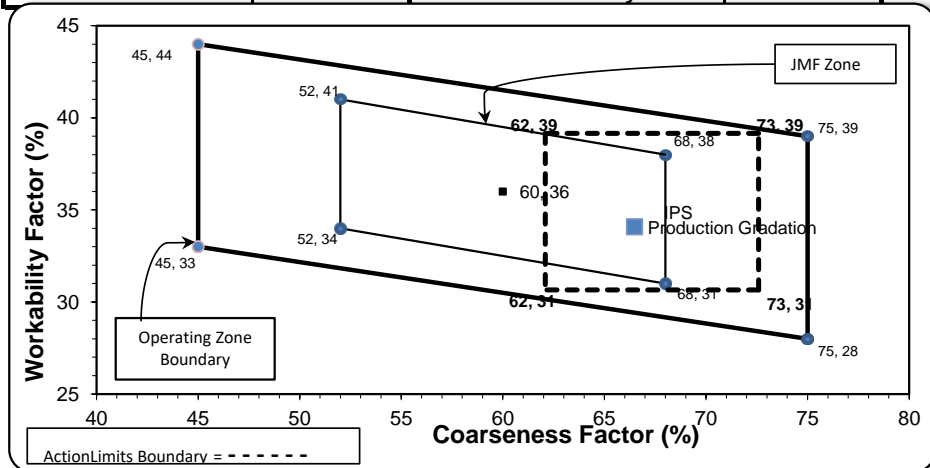
<----- Verify this number is 100%

Sieve	CA	IA	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"	64.6	100.0	100.0	84.5	15.5	15.5
3/4"	39.1	100.0	100.0	73.3	11.2	26.7
1/2"	17.2	92.6	100.0	62.3	10.9	37.7
3/8"	9.6	76.6	100.0	56.2	6.2	43.8
#4	2.6	21.9	98.2	42.8	13.4	57.2
#8	1.6	6.3	83.9	34.1	8.7	65.9
#16	1.4	3.2	67.4	27.1	7.0	72.9
#30	1.3	2.1	49.1	19.8	7.3	80.2
#50	1.2	1.8	25.3	10.6	9.3	89.4
#100	1.1	1.7	7.3	3.6	7.0	96.4
LBW	1.0	1.4	1.5	1.3	2.3	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 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>66</b>	<b>Workability Factor:</b>	<b>34</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>67</b>
<b>Workability Factor:</b>	<b>35</b>

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	85.5	14.5	14.5
3/4"	73.4	12.1	26.6
1/2"	61.0	12.4	39.0
3/8"	56.2	4.8	43.8
#4	43.1	13.1	56.9
#8	34.9	8.2	65.1
#16	29.4	5.5	70.6
#30	21.6	7.8	78.4
#50	8.1	13.4	91.9
#100	2.2	5.9	97.8
LBW	1.4	0.8	98.6

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** **P-103**

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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



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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.5
<b>Total Wt</b>			<b>3120</b>	<b>18.70</b>		<b>100.0</b>

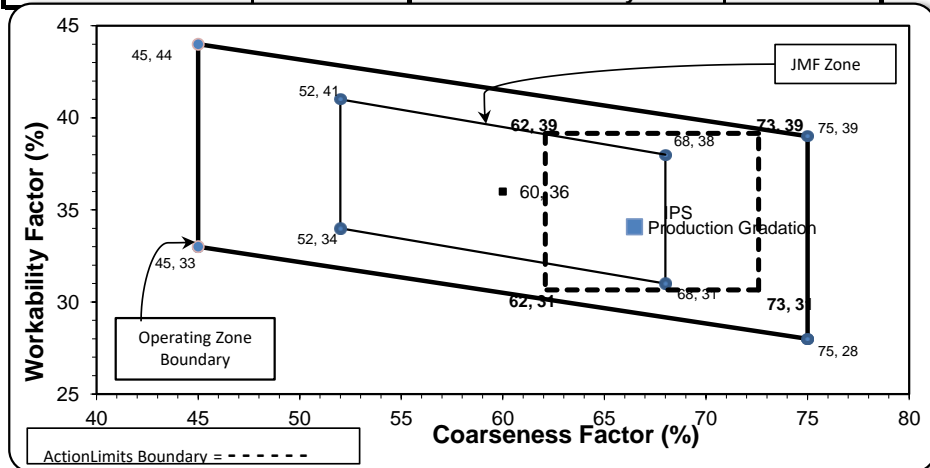
<----- Verify this number is 100%

Sieve	CA	IA	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"	64.6	100.0	100.0	84.5	15.5	15.5
3/4"	39.1	100.0	100.0	73.3	11.2	26.7
1/2"	17.2	92.6	100.0	62.3	10.9	37.7
3/8"	9.6	76.6	100.0	56.2	6.2	43.8
#4	2.6	21.9	98.2	42.8	13.4	57.2
#8	1.6	6.3	83.9	34.1	8.7	65.9
#16	1.4	3.2	67.4	27.1	7.0	72.9
#30	1.3	2.1	49.1	19.8	7.3	80.2
#50	1.2	1.8	25.3	10.6	9.3	89.4
#100	1.1	1.7	7.3	3.6	7.0	96.4
LBW	1.0	1.4	1.5	1.3	2.3	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 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>66</b>	<b>Workability Factor:</b>	<b>34</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>67</b>
<b>Workability Factor:</b>	<b>35</b>

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	85.5	14.5	14.5
3/4"	73.4	12.1	26.6
1/2"	61.0	12.4	39.0
3/8"	56.2	4.8	43.8
#4	43.1	13.1	56.9
#8	34.9	8.2	65.1
#16	29.4	5.5	70.6
#30	21.6	7.8	78.4
#50	8.1	13.4	91.9
#100	2.2	5.9	97.8
LBW	1.4	0.8	98.6

PREPARED BY:  
 SM, LLC Technical Service

Approved BY:

# Aggregate Optimization Chart

**PLANT #:** 14

Sample Date: 7/24/23

Dates Test Represents: 7/25/2023 through 7/31/2023

Concrete Grade: **P1M, 3500HP**

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
2NS	19-04	Schlegel	1200	7.20	2.67	38.5
<b>Total Wt</b>			<b>3120</b>	<b>18.64</b>		<b>100.0</b>

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

Sieve	CA	IA	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"	64.6	100.0	100.0	84.5	15.5	15.5
3/4"	39.1	100.0	100.0	73.3	11.2	26.7
1/2"	17.2	92.6	100.0	62.3	10.9	37.7
3/8"	9.6	76.6	100.0	56.2	6.2	43.8
#4	2.6	21.9	99.9	43.4	12.8	56.6
#8	1.6	6.3	90.1	36.5	7.0	63.5
#16	1.4	3.2	69.4	27.9	8.6	72.1
#30	1.3	2.1	44.5	18.1	9.8	81.9
#50	1.2	1.8	14.3	6.3	11.7	93.7
#100	1.1	1.7	2.7	1.8	4.5	98.2
LBW	1.0	1.4	0.2	0.8	1.1	99.2

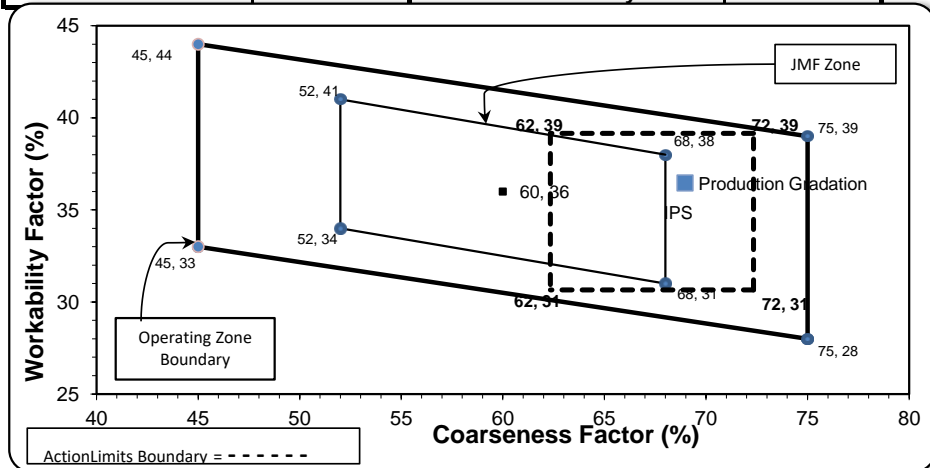


**Builders Redi-Mix**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

\*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 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>69</b>	<b>Workability Factor:</b>	<b>36</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>67</b>
<b>Workability Factor:</b>	<b>35</b>

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	85.5	14.5	14.5
3/4"	73.4	12.1	26.6
1/2"	61.0	12.4	39.0
3/8"	56.2	4.8	43.8
#4	43.1	13.1	56.9
#8	34.9	8.2	65.1
#16	29.4	5.5	70.6
#30	21.6	7.8	78.4
#50	8.1	13.4	91.9
#100	2.2	5.9	97.8
LBW	1.4	0.8	98.6

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** 12

Sample Date: 7/24/23

Dates Test Represents: 7/25/2023 through 7/31/2023

Concrete Grade: **P1M, 3500HP**

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	63-115	Ray Rd	1200	7.26	2.65	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

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



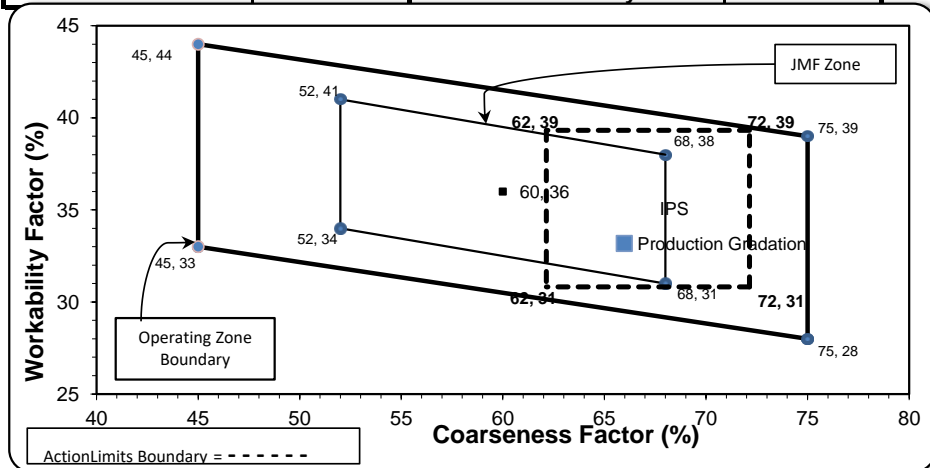
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.7	100.0	100.0	99.2	0.8	0.8
1"	48.5	100.0	100.0	82.9	16.3	17.1
3/4"	13.9	99.0	100.0	71.1	11.8	28.9
1/2"	3.6	81.4	100.0	62.8	8.3	37.2
3/8"	2.4	57.9	100.0	55.9	6.9	44.1
#4	1.9	13.0	96.2	41.8	14.1	58.2
#8	1.9	4.2	80.3	33.2	8.7	66.8
#16	1.9	3.1	65.1	26.9	6.2	73.1
#30	1.8	2.8	49.5	20.7	6.2	79.3
#50	1.8	2.6	26.5	11.7	9.0	88.3
#100	1.7	2.4	6.3	3.7	8.0	96.3
LBW	1.3	1.8	0.8	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:** 66      **Workability Factor:** 33



Intial Production Sample (IPS)

**Coarseness Factor:** 67  
**Workability Factor:** 35

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.0	9.8	26.0
1/2"	63.7	10.3	36.3
3/8"	56.4	7.3	43.6
#4	43.0	13.4	57.0
#8	35.1	7.9	64.9
#16	29.0	6.1	71.0
#30	20.9	8.0	79.1
#50	8.1	12.8	91.9
#100	1.6	6.5	98.4
LBW	0.9	0.8	99.1

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** 20

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

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



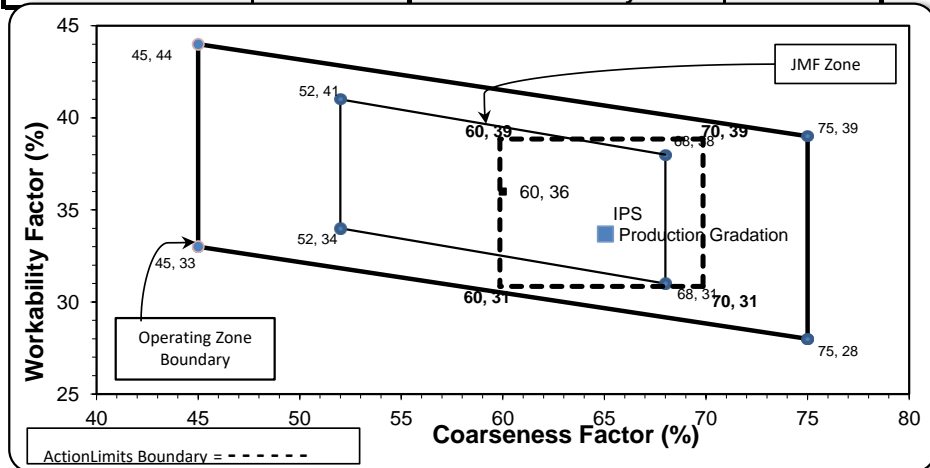
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.9	100.0	100.0	98.3	1.7	1.7
1"	48.5	100.0	100.0	82.9	15.4	17.1
3/4"	18.1	98.2	100.0	72.3	10.6	27.7
1/2"	5.1	81.4	100.0	63.3	9.0	36.7
3/8"	3.5	60.0	100.0	56.9	6.5	43.1
#4	2.7	11.8	96.0	41.7	15.2	58.3
#8	2.5	3.6	81.5	33.7	8.0	66.3
#16	2.4	2.7	66.6	27.6	6.1	72.4
#30	2.2	2.5	47.4	20.0	7.6	80.0
#50	2.1	2.4	20.8	9.5	10.5	90.5
#100	1.9	2.3	3.6	2.7	6.8	97.3
LBW	1.6	2.0	0.6	1.3	1.4	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 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:** 65      **Workability Factor:** 34



Initial Production Sample (IPS)

**Coarseness Factor:** 65  
**Workability Factor:** 35

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.1	0.9	0.9
1"	80.8	18.2	19.2
3/4"	71.3	9.6	28.7
1/2"	64.0	7.3	36.0
3/8"	57.7	6.2	42.3
#4	42.8	15.0	57.2
#8	34.8	7.9	65.2
#16	28.4	6.4	71.6
#30	20.2	8.2	79.8
#50	7.6	12.6	92.4
#100	1.6	6.0	98.4
LBW	1.0	0.6	99.0

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** P11

Sample Date: 7/24/23

Dates Test Represents: 7/25/2023 through 7/31/2023

Concrete Grade: **P1M, 3500HP**

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	95-013	Smelter Bay	1200	7.26	2.65	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

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



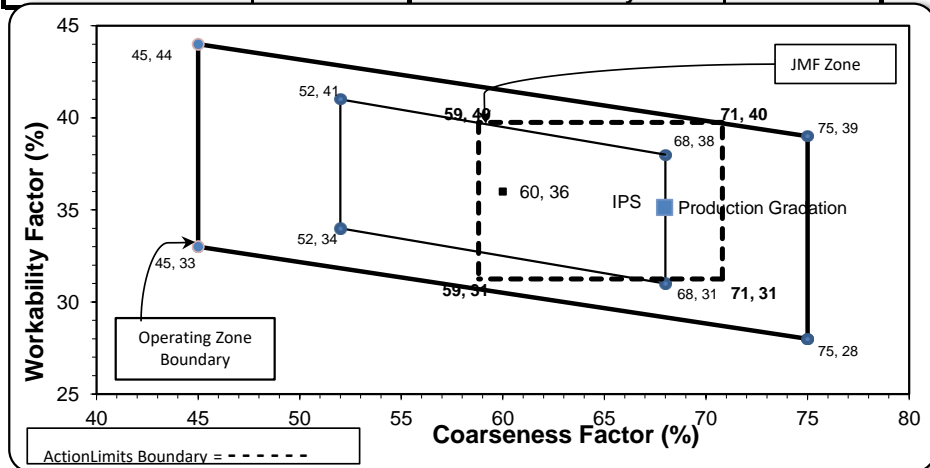
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.7	100.0	100.0	99.2	0.8	0.8
1"	48.5	100.0	100.0	82.9	16.3	17.1
3/4"	13.9	99.0	100.0	71.1	11.8	28.9
1/2"	3.6	81.4	100.0	62.8	8.3	37.2
3/8"	2.4	57.9	100.0	55.9	6.9	44.1
#4	1.9	13.0	96.1	41.8	14.1	58.2
#8	1.9	4.2	85.3	35.1	6.7	64.9
#16	1.9	3.1	70.5	29.0	6.1	71.0
#30	1.8	2.8	51.0	21.3	7.7	78.7
#50	1.8	2.6	24.7	11.0	10.3	89.0
#100	1.7	2.4	7.6	4.2	6.8	95.8
LBW	1.3	1.8	1.3	1.4	2.8	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 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:** 35



Initial Production Sample (IPS)

**Coarseness Factor:** 65  
**Workability Factor:** 36

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.0	0.6	0.6
1"	84.0	15.3	16.0
3/4"	73.5	10.5	26.5
1/2"	65.2	8.2	34.8
3/8"	58.2	7.1	41.8
#4	44.1	14.1	55.9
#8	35.5	8.6	64.5
#16	29.1	6.4	70.9
#30	21.9	7.3	78.1
#50	9.6	12.2	90.4
#100	2.6	7.1	97.4
LBW	1.0	1.6	99.0

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

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

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	95-013	Smelter Bay	1200	7.26	2.65	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

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



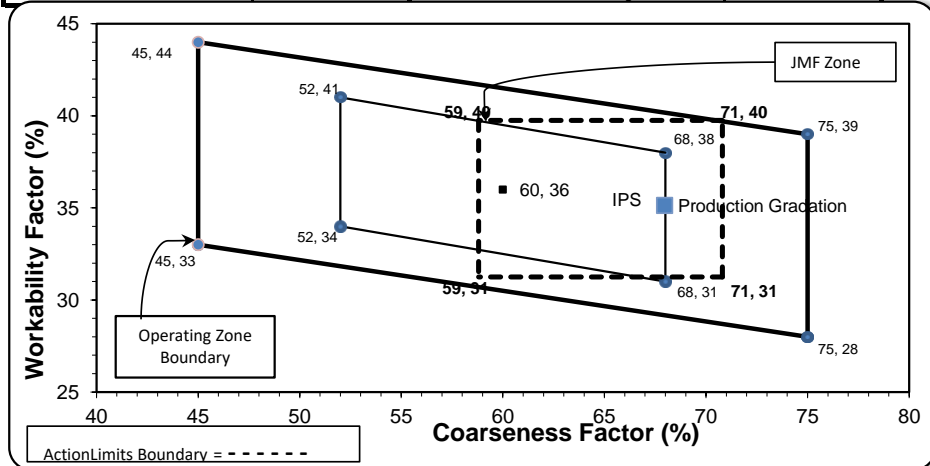
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.7	100.0	100.0	99.2	0.8	0.8
1"	48.5	100.0	100.0	82.9	16.3	17.1
3/4"	13.9	99.0	100.0	71.1	11.8	28.9
1/2"	3.6	81.4	100.0	62.8	8.3	37.2
3/8"	2.4	57.9	100.0	55.9	6.9	44.1
#4	1.9	13.0	96.1	41.8	14.1	58.2
#8	1.9	4.2	85.3	35.1	6.7	64.9
#16	1.9	3.1	70.5	29.0	6.1	71.0
#30	1.8	2.8	51.0	21.3	7.7	78.7
#50	1.8	2.6	24.7	11.0	10.3	89.0
#100	1.7	2.4	7.6	4.2	6.8	95.8
LBW	1.3	1.8	1.3	1.4	2.8	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 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:** **35**



Initial Production Sample (IPS)

**Coarseness Factor:** **65**  
**Workability Factor:** **36**

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.0	0.6	0.6
1"	84.0	15.3	16.0
3/4"	73.5	10.5	26.5
1/2"	65.2	8.2	34.8
3/8"	58.2	7.1	41.8
#4	44.1	14.1	55.9
#8	35.5	8.6	64.5
#16	29.1	6.4	70.9
#30	21.9	7.3	78.1
#50	9.6	12.2	90.4
#100	2.6	7.1	97.4
LBW	1.0	1.6	99.0

PREPARED BY:  
 SM, LLC Technical Service

Approved By:



# Aggregate Optimization Chart

**PLANT #:** **P-35**

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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



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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.5
<b>Total Wt</b>			<b>3120</b>	<b>18.70</b>		<b>100.0</b>

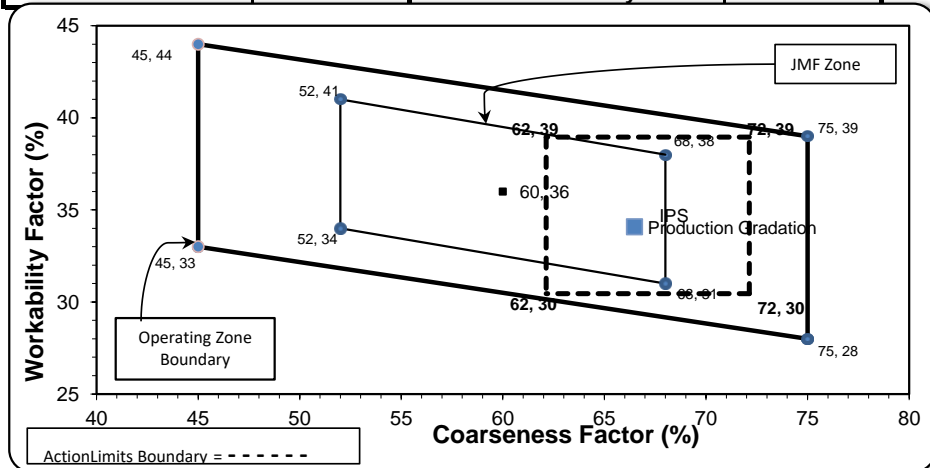
<----- Verify this number is 100%

Sieve	CA	IA	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"	64.6	100.0	100.0	84.5	15.5	15.5
3/4"	39.1	100.0	100.0	73.3	11.2	26.7
1/2"	17.2	92.6	100.0	62.3	10.9	37.7
3/8"	9.6	76.6	100.0	56.2	6.2	43.8
#4	2.6	21.9	98.2	42.8	13.4	57.2
#8	1.6	6.3	83.9	34.1	8.7	65.9
#16	1.4	3.2	67.4	27.1	7.0	72.9
#30	1.3	2.1	49.1	19.8	7.3	80.2
#50	1.2	1.8	25.3	10.6	9.3	89.4
#100	1.1	1.7	7.3	3.6	7.0	96.4
LBW	1.0	1.4	1.5	1.3	2.3	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 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>66</b>	<b>Workability Factor:</b>	<b>34</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>67</b>
<b>Workability Factor:</b>	<b>35</b>

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	86.9	13.1	13.1
3/4"	76.1	10.8	23.9
1/2"	63.7	12.4	36.3
3/8"	56.2	7.5	43.8
#4	43.2	13.0	56.8
#8	34.7	8.5	65.3
#16	27.5	7.2	72.5
#30	20.6	7.0	79.4
#50	9.0	11.6	91.0
#100	2.1	6.9	97.9
LBW	1.0	1.1	99.0

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** **P-36**

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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



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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

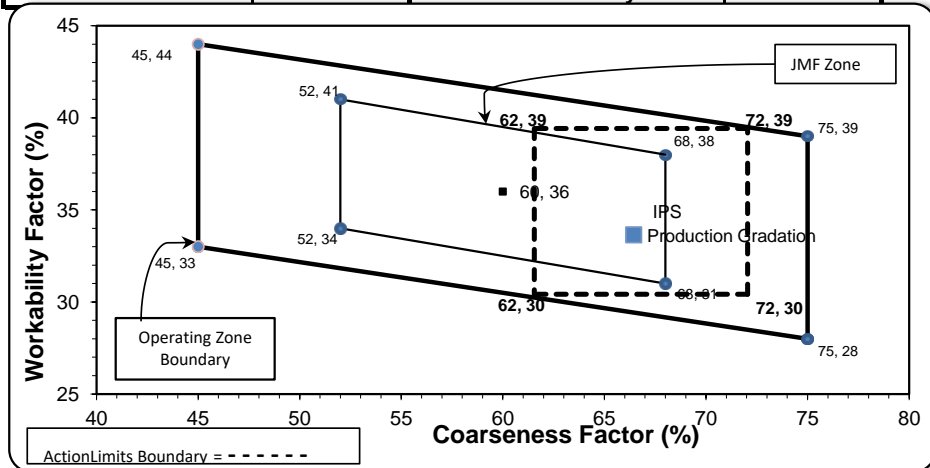
<----- Verify this number is 100%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.7	100.0	100.0	99.2	0.8	0.8
1"	48.5	100.0	100.0	82.9	16.3	17.1
3/4"	13.9	99.0	100.0	71.1	11.8	28.9
1/2"	3.6	81.4	100.0	62.8	8.3	37.2
3/8"	2.4	57.9	100.0	55.9	6.9	44.1
#4	1.9	13.0	96.0	41.8	14.2	58.2
#8	1.9	4.2	81.5	33.7	8.1	66.3
#16	1.9	3.1	66.6	27.5	6.1	72.5
#30	1.8	2.8	47.4	19.9	7.6	80.1
#50	1.8	2.6	20.8	9.4	10.5	90.6
#100	1.7	2.4	3.6	2.6	6.8	97.4
LBW	1.3	1.8	0.6	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.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **66**      **Workability Factor:** **34**



Initial Production Sample (IPS)

**Coarseness Factor:** **67**  
**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"	85.0	15.0	15.0
3/4"	72.1	12.9	27.9
1/2"	64.5	7.6	35.5
3/8"	56.5	8.0	43.5
#4	42.7	13.8	57.3
#8	34.9	7.8	65.1
#16	29.0	5.9	71.0
#30	21.0	8.0	79.0
#50	8.2	12.8	91.8
#100	1.6	6.5	98.4
LBW	0.7	0.9	99.3

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** **P-39**

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	44-051	Krake Willis Rd	1250	7.56	2.65	40.7
<b>Total Wt</b>			<b>3070</b>	<b>18.69</b>		<b>100.0</b>

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



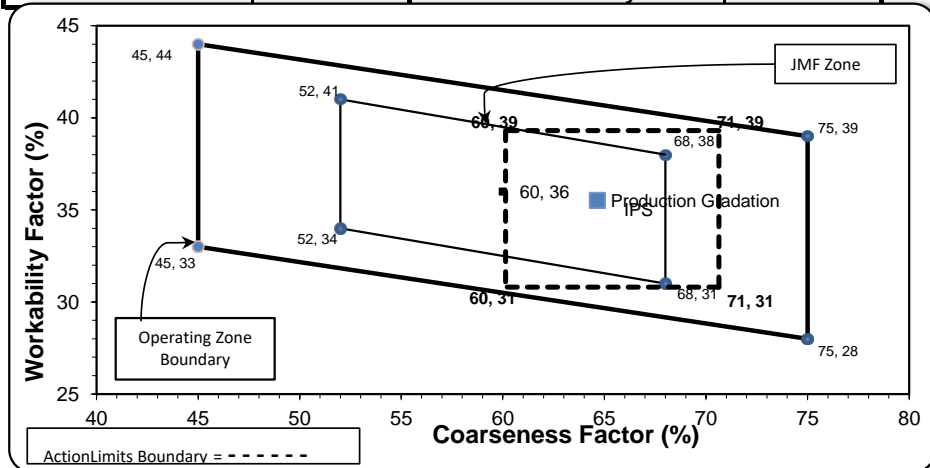
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	98.0	2.0	2.0
1"	34.6	100.0	100.0	78.3	19.7	21.7
3/4"	8.8	98.5	100.0	69.3	9.0	30.7
1/2"	3.2	83.2	100.0	63.5	5.8	36.5
3/8"	3.0	63.7	100.0	58.3	5.1	41.7
#4	2.5	17.3	95.9	44.4	13.9	55.6
#8	2.4	4.5	82.4	35.5	8.9	64.5
#16	2.4	2.7	68.2	29.3	6.3	70.7
#30	2.3	2.3	51.0	22.1	7.1	77.9
#50	2.2	2.1	23.0	10.6	11.5	89.4
#100	2.0	1.9	5.6	3.4	7.2	96.6
LBW	1.6	1.7	1.1	1.4	2.0	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 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:** **65**      **Workability Factor:** **36**



Initial Production Sample (IPS)

**Coarseness Factor:** **65**  
**Workability Factor:** **35**

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.1	9.8	25.9
1/2"	64.3	9.7	35.7
3/8"	57.5	6.8	42.5
#4	44.5	13.1	55.5
#8	35.1	9.4	64.9
#16	27.9	7.2	72.1
#30	21.7	6.2	78.3
#50	12.6	9.1	87.4
#100	3.5	9.1	96.5
LBW	1.2	2.4	98.8

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** **P-02**

Sample Date: 7/24/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/25/2023 through 7/31/2023

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	63-115	Ray Rd	1200	7.26	2.65	39.1
<b>Total Wt</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

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



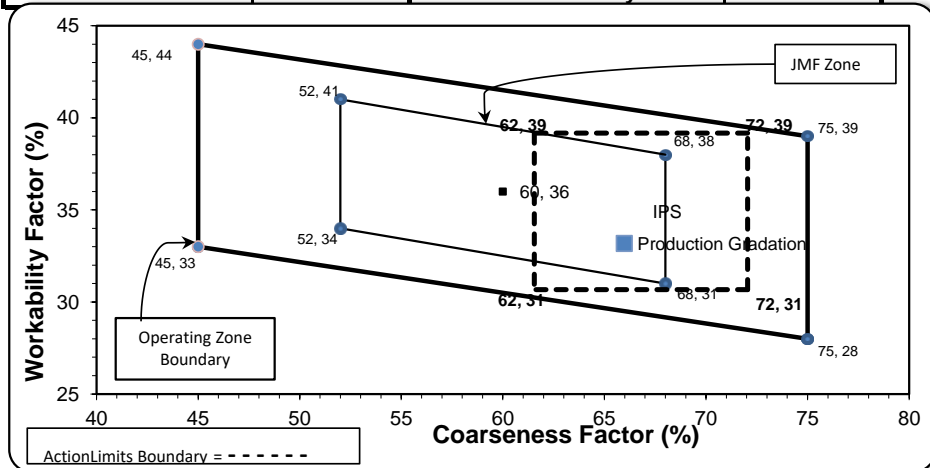
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.7	100.0	100.0	99.2	0.8	0.8
1"	48.5	100.0	100.0	82.9	16.3	17.1
3/4"	13.9	99.0	100.0	71.1	11.8	28.9
1/2"	3.6	81.4	100.0	62.8	8.3	37.2
3/8"	2.4	57.9	100.0	55.9	6.9	44.1
#4	1.9	13.0	96.2	41.8	14.1	58.2
#8	1.9	4.2	80.3	33.2	8.7	66.8
#16	1.9	3.1	65.1	26.9	6.2	73.1
#30	1.8	2.8	49.5	20.7	6.2	79.3
#50	1.8	2.6	26.5	11.7	9.0	88.3
#100	1.7	2.4	6.3	3.7	8.0	96.3
LBW	1.3	1.8	0.8	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:** **66**      **Workability Factor:** **33**



Intial Production Sample (IPS)

**Coarseness Factor:** **67**  
**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"	85.0	15.0	15.0
3/4"	72.3	12.7	27.7
1/2"	64.5	7.8	35.5
3/8"	56.5	8.0	43.5
#4	42.7	13.8	57.3
#8	34.9	7.8	65.1
#16	29.0	5.9	71.0
#30	21.0	8.0	79.0
#50	8.2	12.8	91.8
#100	1.6	6.5	98.4
LBW	0.7	0.9	99.3

PREPARED BY:  
 SM, LLC Technical Service

Approved By: