

# Aggregate Optimization Chart

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

Sample Date: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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

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"	98.7	100.0	100.0	99.5	0.5	0.5
1"	47.5	100.0	100.0	81.7	17.8	18.3
3/4"	12.4	98.5	100.0	69.1	12.6	30.9
1/2"	3.0	83.2	100.0	61.8	7.3	38.2
3/8"	2.0	63.7	100.0	56.4	5.4	43.6
#4	1.6	17.3	99.1	43.8	12.6	56.2
#8	1.4	4.5	86.7	35.5	8.3	64.5
#16	1.4	2.7	71.8	29.3	6.3	70.7
#30	1.3	2.3	53.6	22.0	7.3	78.0
#50	1.2	2.1	22.9	9.9	12.1	90.1
#100	1.1	1.9	5.2	2.9	7.0	97.1
LBW	0.9	1.7	1.0	1.1	1.8	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.

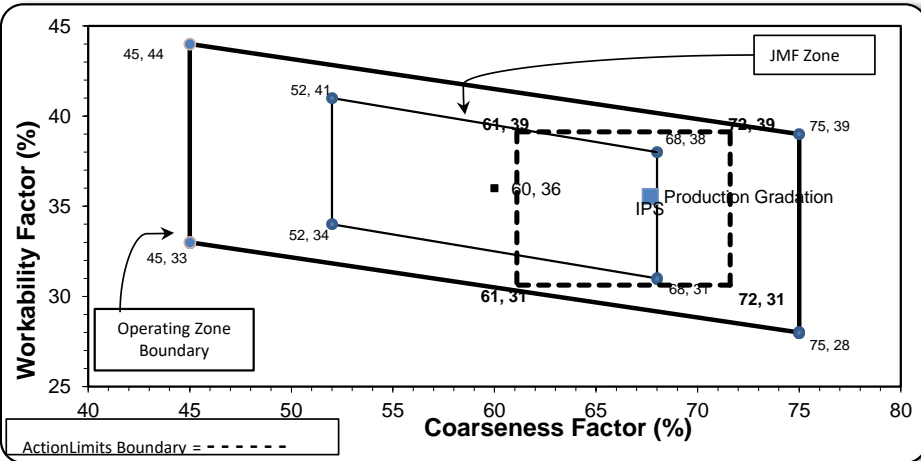
Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor: 68**      **Workability Factor: 36**

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: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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	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%



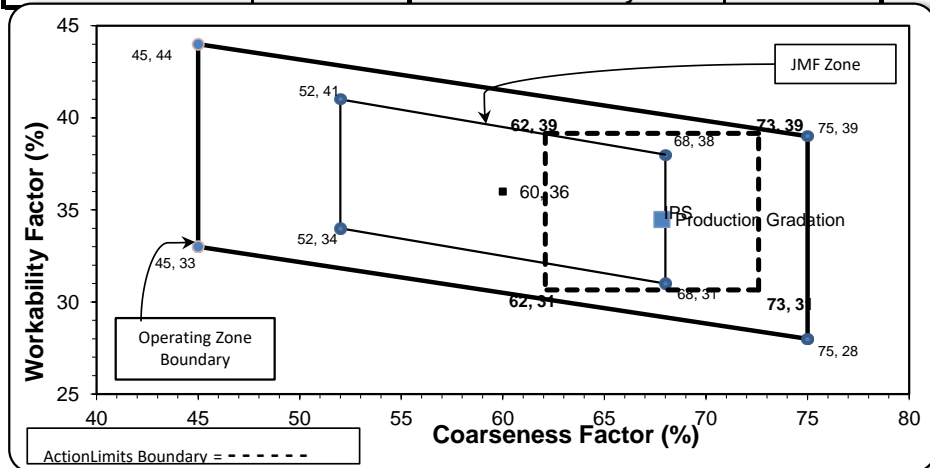
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	66.0	100.0	100.0	85.1	14.9	14.9
3/4"	39.1	100.0	100.0	73.3	11.8	26.7
1/2"	14.1	95.3	100.0	61.5	11.8	38.5
3/8"	6.3	81.3	100.0	55.6	5.9	44.4
#4	2.3	26.2	99.1	43.7	11.8	56.3
#8	1.8	7.4	84.2	34.5	9.3	65.5
#16	1.6	3.5	66.5	26.9	7.6	73.1
#30	1.5	2.4	46.6	19.0	7.9	81.0
#50	1.4	2.2	22.0	9.5	9.5	90.5
#100	1.4	2.1	8.6	4.3	5.2	95.7
LBW	1.2	1.9	1.1	1.3	3.0	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>68</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: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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	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%



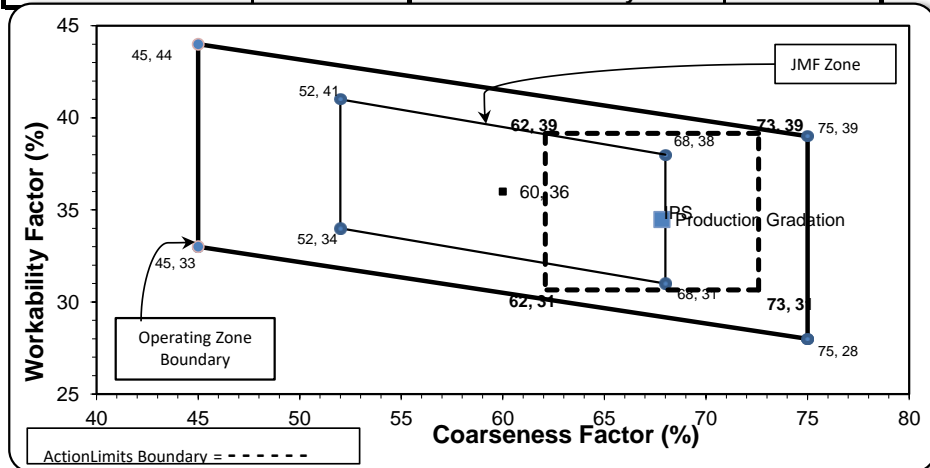
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	66.0	100.0	100.0	85.1	14.9	14.9
3/4"	39.1	100.0	100.0	73.3	11.8	26.7
1/2"	14.1	95.3	100.0	61.5	11.8	38.5
3/8"	6.3	81.3	100.0	55.6	5.9	44.4
#4	2.3	26.2	99.1	43.7	11.8	56.3
#8	1.8	7.4	84.2	34.5	9.3	65.5
#16	1.6	3.5	66.5	26.9	7.6	73.1
#30	1.5	2.4	46.6	19.0	7.9	81.0
#50	1.4	2.2	22.0	9.5	9.5	90.5
#100	1.4	2.1	8.6	4.3	5.2	95.7
LBW	1.2	1.9	1.1	1.3	3.0	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:** **68**      **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"	85.5	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-14**

Sample Date: 9/19/22

Concrete Grade: **P1M, 3500HP**

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

Dates Test Represents: 9/20/2022 through 9/26/2022

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	19-55	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%



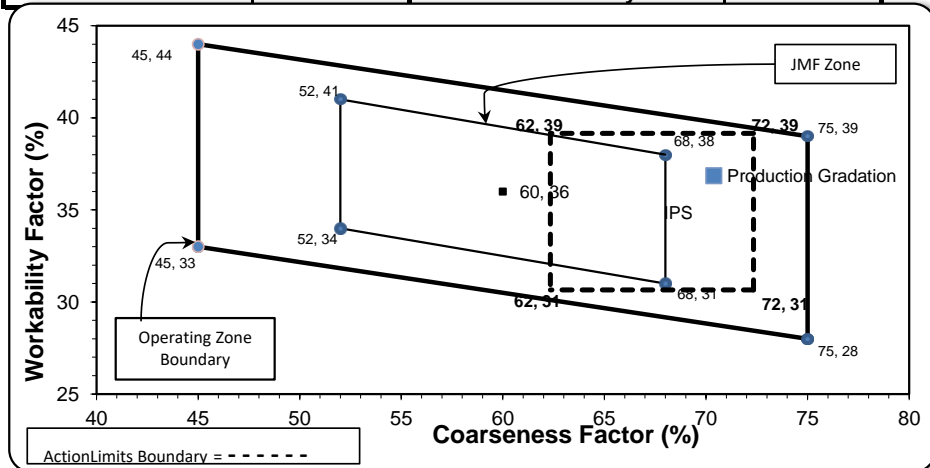
**Builders Redi-Mix**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	66.0	100.0	100.0	85.1	14.9	14.9
3/4"	39.1	100.0	100.0	73.3	11.8	26.7
1/2"	14.1	95.3	100.0	61.5	11.8	38.5
3/8"	6.3	81.3	100.0	55.6	5.9	44.4
#4	2.3	26.2	100.0	44.1	11.5	55.9
#8	1.8	7.4	90.4	36.9	7.2	63.1
#16	1.6	3.5	68.8	27.8	9.1	72.2
#30	1.5	2.4	44.3	18.1	9.7	81.9
#50	1.4	2.2	14.4	6.5	11.6	93.5
#100	1.4	2.1	2.7	2.0	4.5	98.0
LBW	1.2	1.9	0.3	1.0	1.0	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

<b>Coarseness Factor:</b>	<b>70</b>	<b>Workability Factor:</b>	<b>37</b>
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Initial Production Sample (IPS)

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-12**

Sample Date: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	63-115	Ray 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%



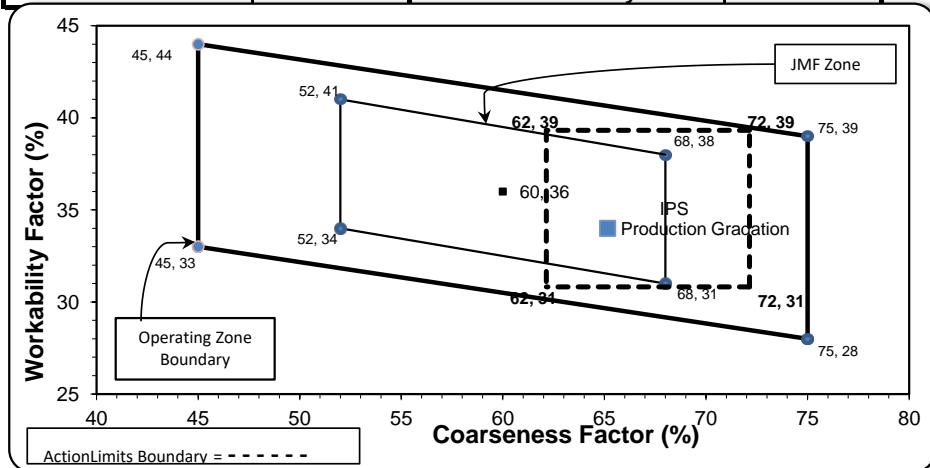
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.4	100.0	100.0	98.5	1.5	1.5
1"	36.1	100.0	100.0	79.8	18.7	20.2
3/4"	12.5	99.8	100.0	72.3	7.5	27.7
1/2"	4.0	81.0	100.0	64.4	7.9	35.6
3/8"	3.0	55.4	100.0	57.0	7.4	43.0
#4	2.6	9.6	97.0	43.0	14.0	57.0
#8	2.5	2.9	79.6	34.0	9.0	66.0
#16	2.4	2.1	62.7	26.9	7.1	73.1
#30	2.3	2.0	45.6	19.8	7.0	80.2
#50	2.2	1.8	23.5	10.8	9.1	89.2
#100	2.1	1.8	5.7	3.5	7.3	96.5
LBW	1.6	1.4	1.2	1.4	2.1	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:** **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"	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 #:** **P-32**

Sample Date: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	95-013	Smelter Bay	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%



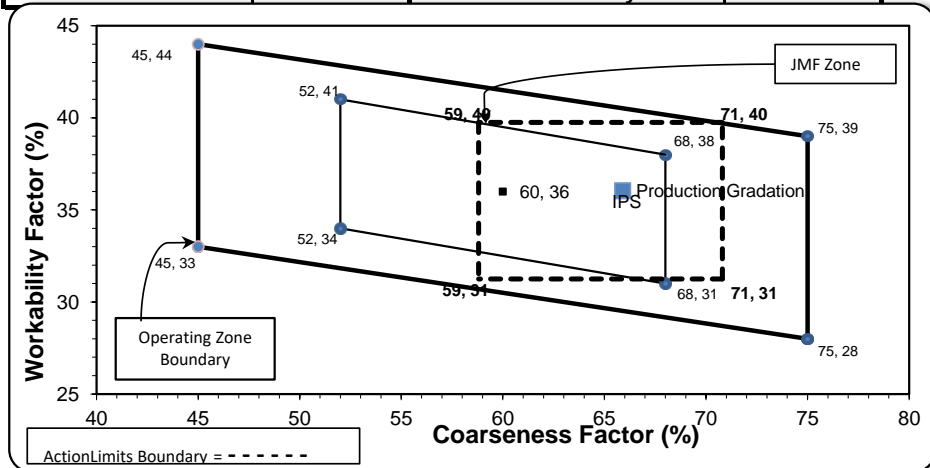
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.4	100.0	100.0	98.6	1.4	1.4
1"	36.1	100.0	100.0	80.9	17.8	19.1
3/4"	12.5	99.8	100.0	73.7	7.1	26.3
1/2"	4.0	81.0	100.0	65.7	8.1	34.3
3/8"	3.0	55.4	100.0	57.9	7.8	42.1
#4	2.6	9.6	96.5	42.9	15.0	57.1
#8	2.5	2.9	84.6	36.0	6.8	64.0
#16	2.4	2.1	69.7	29.7	6.3	70.3
#30	2.3	2.0	50.5	21.8	7.9	78.2
#50	2.2	1.8	23.8	10.9	11.0	89.1
#100	2.1	1.8	6.7	3.9	7.0	96.1
LBW	1.6	1.4	1.1	1.3	2.5	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: 66**      **Workability Factor: 36**



Intial 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: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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	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%



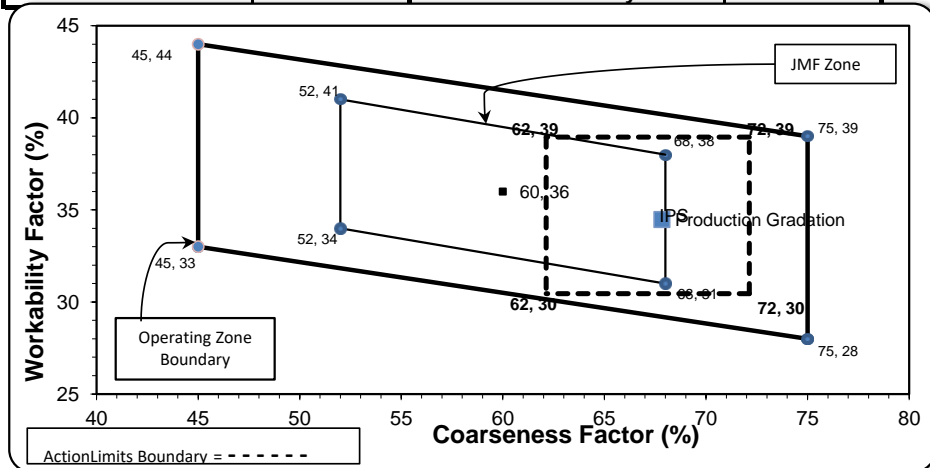
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	66.0	100.0	100.0	85.1	14.9	14.9
3/4"	39.1	100.0	100.0	73.3	11.8	26.7
1/2"	14.1	95.3	100.0	61.5	11.8	38.5
3/8"	6.3	81.3	100.0	55.6	5.9	44.4
#4	2.3	26.2	99.1	43.7	11.8	56.3
#8	1.8	7.4	84.2	34.5	9.3	65.5
#16	1.6	3.5	66.5	26.9	7.6	73.1
#30	1.5	2.4	46.6	19.0	7.9	81.0
#50	1.4	2.2	22.0	9.5	9.5	90.5
#100	1.4	2.1	8.6	4.3	5.2	95.7
LBW	1.2	1.9	1.1	1.3	3.0	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:** **68**      **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"	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: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
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%



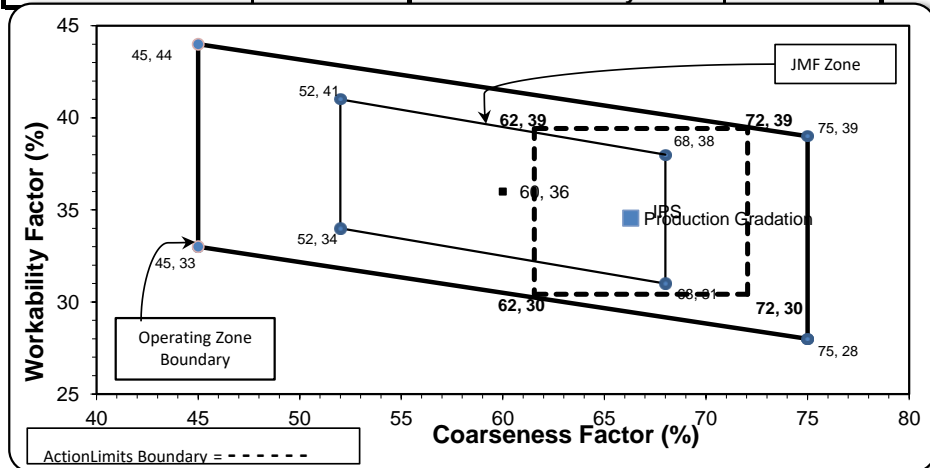
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.4	100.0	100.0	98.6	1.4	1.4
1"	36.1	100.0	100.0	80.2	18.4	19.8
3/4"	12.5	99.8	100.0	72.9	7.4	27.1
1/2"	4.0	81.0	100.0	64.6	8.3	35.4
3/8"	3.0	55.4	100.0	56.6	8.0	43.4
#4	2.6	9.6	97.6	41.8	14.8	58.2
#8	2.5	2.9	84.2	34.6	7.3	65.4
#16	2.4	2.1	70.8	29.0	5.5	71.0
#30	2.3	2.0	52.7	21.9	7.1	78.1
#50	2.2	1.8	22.8	10.1	11.8	89.9
#100	2.1	1.8	5.1	3.2	6.9	96.8
LBW	1.6	1.4	2.0	1.7	1.5	98.3

\*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 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>35</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"	85.0	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: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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%



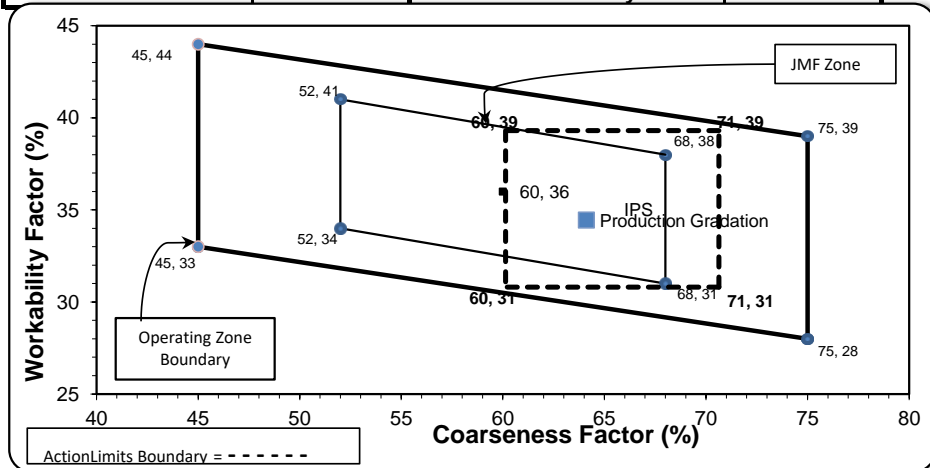
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.7	100.0	100.0	99.6	0.4	0.4
1"	47.5	100.0	100.0	82.6	17.0	17.4
3/4"	12.4	98.5	100.0	70.5	12.1	29.5
1/2"	3.0	83.2	100.0	63.4	7.1	36.6
3/8"	2.0	63.7	100.0	58.0	5.4	42.0
#4	1.6	17.3	96.2	44.2	13.8	55.8
#8	1.4	4.5	80.6	34.5	9.8	65.5
#16	1.4	2.7	65.9	28.0	6.5	72.0
#30	1.3	2.3	50.9	21.8	6.2	78.2
#50	1.2	2.1	27.6	12.2	9.6	87.8
#100	1.1	1.9	8.4	4.3	7.9	95.7
LBW	0.9	1.7	1.6	1.4	2.9	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:** **64**      **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"	99.6	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: 9/19/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 9/20/2022 through 9/26/2022

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	63-115	Ray 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%



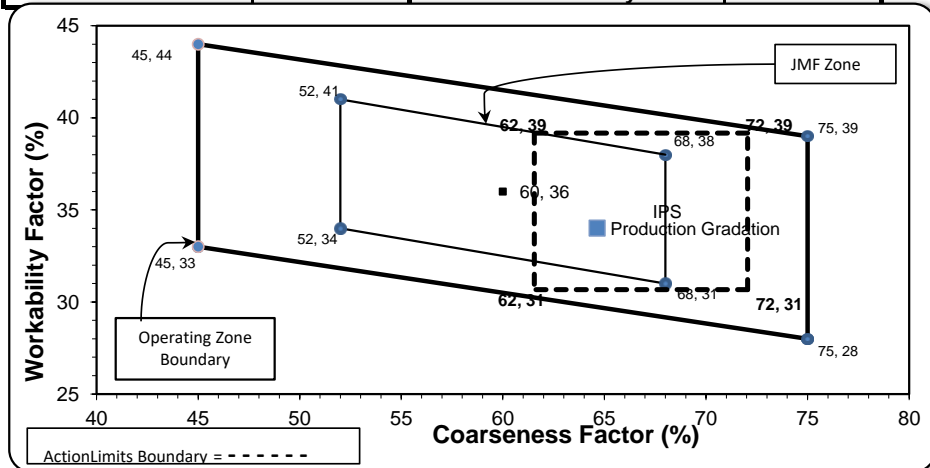
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.4	100.0	100.0	98.6	1.4	1.4
1"	36.1	100.0	100.0	80.2	18.4	19.8
3/4"	12.5	99.8	100.0	72.9	7.4	27.1
1/2"	4.0	81.0	100.0	64.9	8.0	35.1
3/8"	3.0	55.4	100.0	57.3	7.6	42.7
#4	2.6	9.6	97.0	43.0	14.3	57.0
#8	2.5	2.9	79.6	34.0	9.0	66.0
#16	2.4	2.1	62.7	26.9	7.1	73.1
#30	2.3	2.0	45.6	19.8	7.0	80.2
#50	2.2	1.8	23.5	10.8	9.1	89.2
#100	2.1	1.8	5.7	3.5	7.3	96.5
LBW	1.6	1.4	1.2	1.4	2.1	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:** **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"	72.3	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: