

# Aggregate Optimization Chart

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

Sample Date: 10/28/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/29/2024 through 11/4/2024

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1470	8.76	2.69	47.1
IA	58-003	Stoneco	450	2.68	2.69	14.4
2NS	63-114	Highland	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%



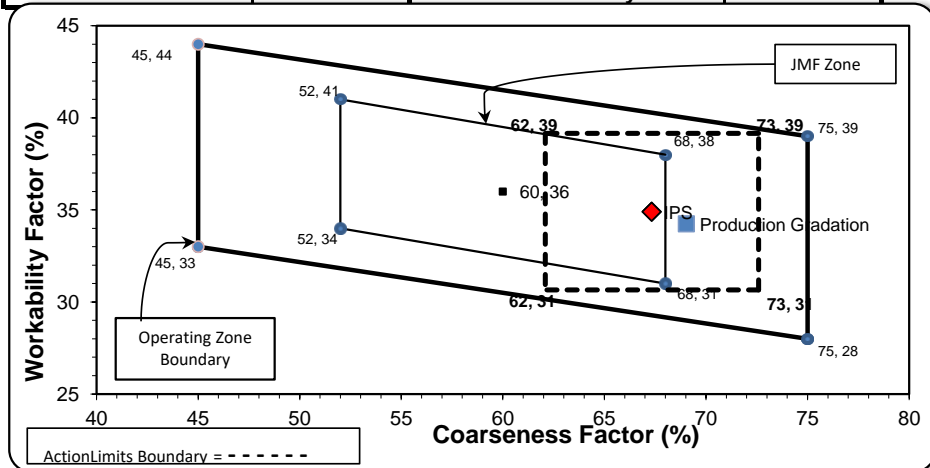
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

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"	62.3	100.0	100.0	82.2	17.8	17.8
3/4"	31.8	100.0	100.0	67.9	14.4	32.1
1/2"	19.1	91.8	100.0	60.7	7.2	39.3
3/8"	11.9	73.1	100.0	54.6	6.1	45.4
#4	2.9	20.8	99.1	42.5	12.1	57.5
#8	2.0	5.6	84.5	34.3	8.2	65.8
#16	1.6	2.3	65.4	26.2	8.0	73.8
#30	1.5	1.7	43.8	17.8	8.4	82.2
#50	1.4	1.4	18.0	7.8	10.0	92.2
#100	1.3	1.3	3.8	2.3	5.5	97.7
LBW	1.1	1.1	0.6	0.9	1.4	99.1

\*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>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: 10/28/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/29/2024 through 11/4/2024

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1470	8.76	2.69	47.1
IA	58-003	Stoneco	450	2.68	2.69	14.4
2NS	63-114	Highland	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%



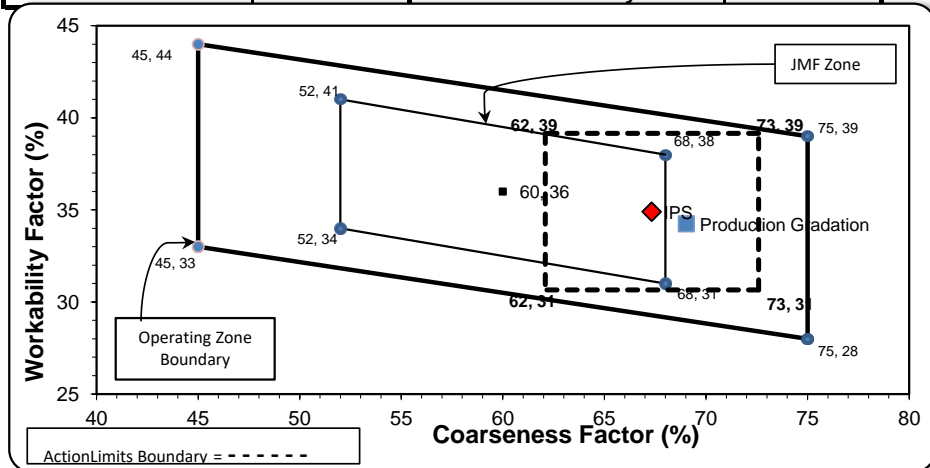
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 Farmington Hills, MI 48336

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"	62.3	100.0	100.0	82.2	17.8	17.8
3/4"	31.8	100.0	100.0	67.9	14.4	32.1
1/2"	19.1	91.8	100.0	60.7	7.2	39.3
3/8"	11.9	73.1	100.0	54.6	6.1	45.4
#4	2.9	20.8	99.1	42.5	12.1	57.5
#8	2.0	5.6	84.5	34.3	8.2	65.8
#16	1.6	2.3	65.4	26.2	8.0	73.8
#30	1.5	1.7	43.8	17.8	8.4	82.2
#50	1.4	1.4	18.0	7.8	10.0	92.2
#100	1.3	1.3	3.8	2.3	5.5	97.7
LBW	1.1	1.1	0.6	0.9	1.4	99.1

\*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:** 69      **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 #:** 12

Sample Date: 10/28/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/29/2024 through 11/4/2024

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
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%



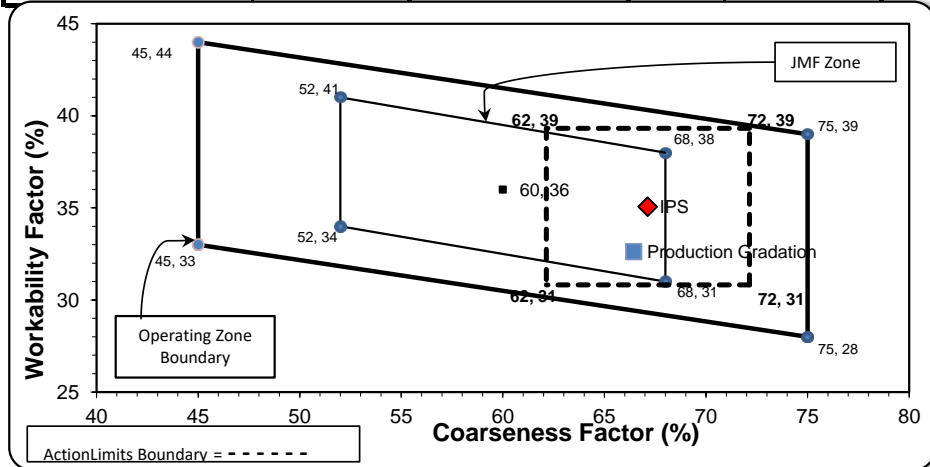
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	42.6	100.0	100.0	83.7	16.3	16.3
3/4"	12.9	98.7	100.0	74.9	8.8	25.1
1/2"	5.4	78.4	100.0	66.2	8.7	33.8
3/8"	4.0	46.1	100.0	55.2	10.9	44.8
#4	2.4	4.9	96.9	40.2	15.1	59.8
#8	2.1	2.1	80.2	32.6	7.5	67.4
#16	2.0	1.7	64.1	26.2	6.5	73.8
#30	1.9	1.6	49.1	20.3	5.9	79.7
#50	1.8	1.6	26.1	11.2	9.0	88.8
#100	1.7	1.5	6.6	3.6	7.7	96.4
LBW	1.3	1.3	1.0	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 #:** **P11**

Sample Date: 10/28/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/29/2024 through 11/4/2024

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
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%



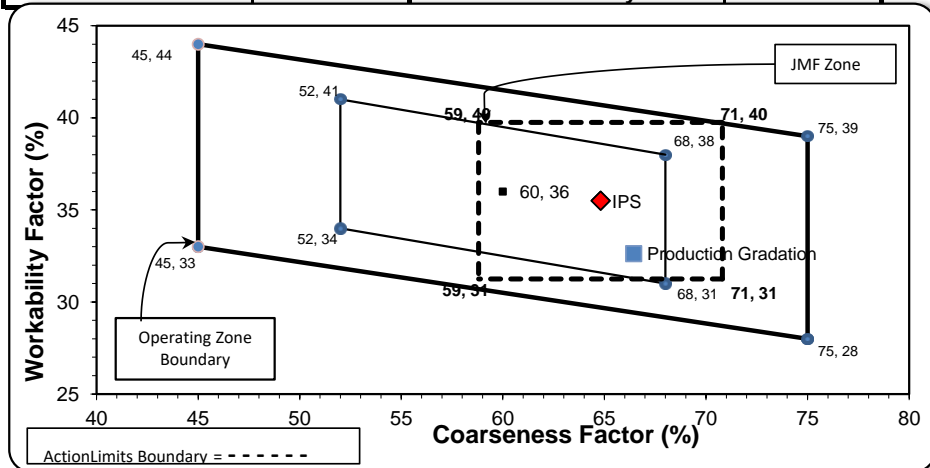
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 Farmington Hills, MI 48336

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"	42.6	100.0	100.0	83.7	16.3	16.3
3/4"	12.9	98.7	100.0	74.9	8.8	25.1
1/2"	5.4	78.4	100.0	66.2	8.7	33.8
3/8"	4.0	46.1	100.0	55.2	10.9	44.8
#4	2.4	4.9	96.9	40.2	15.1	59.8
#8	2.1	2.1	80.2	32.6	7.5	67.4
#16	2.0	1.7	64.1	26.2	6.5	73.8
#30	1.9	1.6	49.1	20.3	5.9	79.7
#50	1.8	1.6	26.1	11.2	9.0	88.8
#100	1.7	1.5	6.6	3.6	7.7	96.4
LBW	1.3	1.3	1.0	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**



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-O2**

Sample Date: 10/28/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/29/2024 through 11/4/2024

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
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%



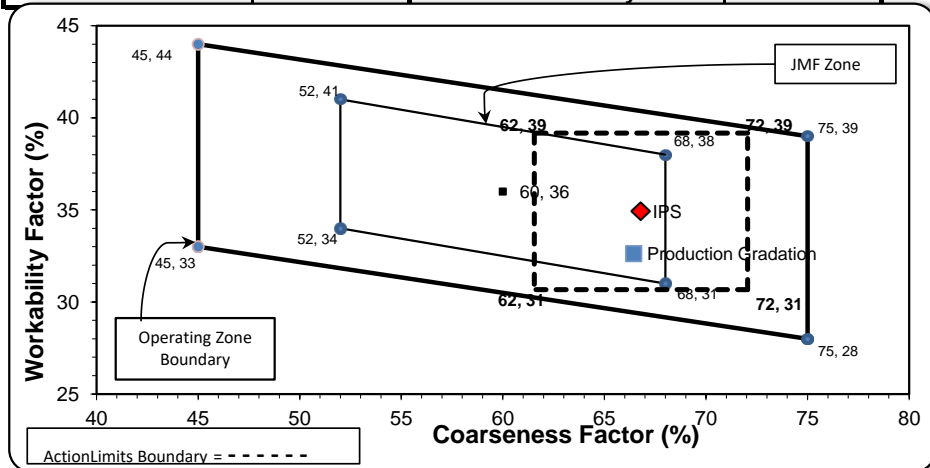
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	42.6	100.0	100.0	83.7	16.3	16.3
3/4"	12.9	98.7	100.0	74.9	8.8	25.1
1/2"	5.4	78.4	100.0	66.2	8.7	33.8
3/8"	4.0	46.1	100.0	55.2	10.9	44.8
#4	2.4	4.9	96.9	40.2	15.1	59.8
#8	2.1	2.1	80.2	32.6	7.5	67.4
#16	2.0	1.7	64.1	26.2	6.5	73.8
#30	1.9	1.6	49.1	20.3	5.9	79.7
#50	1.8	1.6	26.1	11.2	9.0	88.8
#100	1.7	1.5	6.6	3.6	7.7	96.4
LBW	1.3	1.3	1.0	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**



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"	72.3	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: