

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3070	18.67		100.0

<---- 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"	94.8	100.0	100.0	98.2	1.8	1.8
1"	34.4	100.0	100.0	77.1	21.1	22.9
3/4"	10.8	98.5	100.0	68.5	8.6	31.5
1/2"	3.9	83.2	100.0	62.1	6.4	37.9
3/8"	3.4	63.7	100.0	56.9	5.3	43.1
#4	3.0	17.3	95.8	43.0	13.9	57.0
#8	2.8	4.5	79.4	33.2	9.8	66.8
#16	2.7	2.7	63.5	26.5	6.7	73.5
#30	2.6	2.3	48.1	20.3	6.2	79.7
#50	2.5	2.1	24.4	11.0	9.4	89.0
#100	2.2	1.9	6.5	3.8	7.2	96.2
LBW	1.8	1.7	0.8	1.4	2.4	98.6

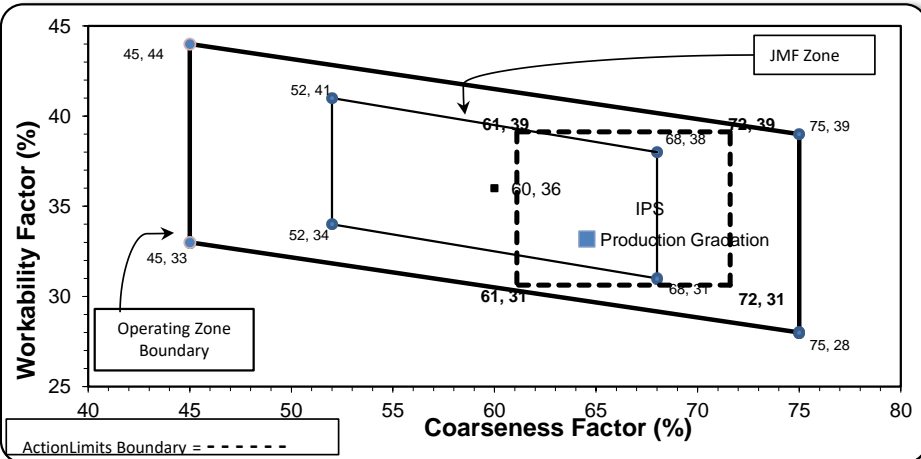
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	65	Workability Factor:	33
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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: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3120	18.70		100.0

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



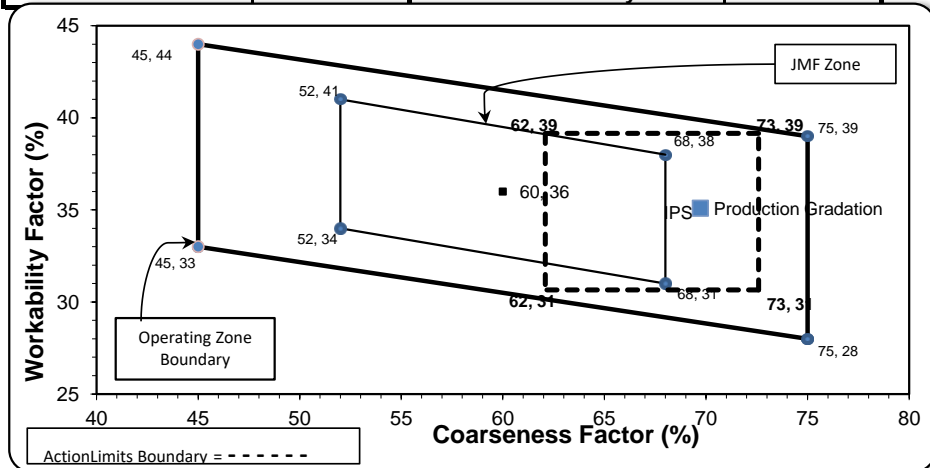
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 Suite 500
 Farmington Hills, MI 48336

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"	59.3	100.0	100.0	82.1	17.9	17.9
3/4"	32.1	100.0	100.0	70.2	11.9	29.8
1/2"	13.1	90.2	100.0	60.1	10.1	39.9
3/8"	7.3	74.2	100.0	54.7	5.4	45.3
#4	2.8	21.2	98.3	42.8	12.0	57.2
#8	1.9	7.6	85.6	35.1	7.7	64.9
#16	1.7	4.4	68.3	27.8	7.3	72.2
#30	1.5	3.4	48.1	19.8	8.0	80.2
#50	1.4	3.0	23.5	10.2	9.6	89.8
#100	1.3	2.8	4.9	2.9	7.2	97.1
LBW	1.1	2.5	0.5	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: **70** **Workability Factor:** **35**



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-103**

Sample Date: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3120	18.70		100.0

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



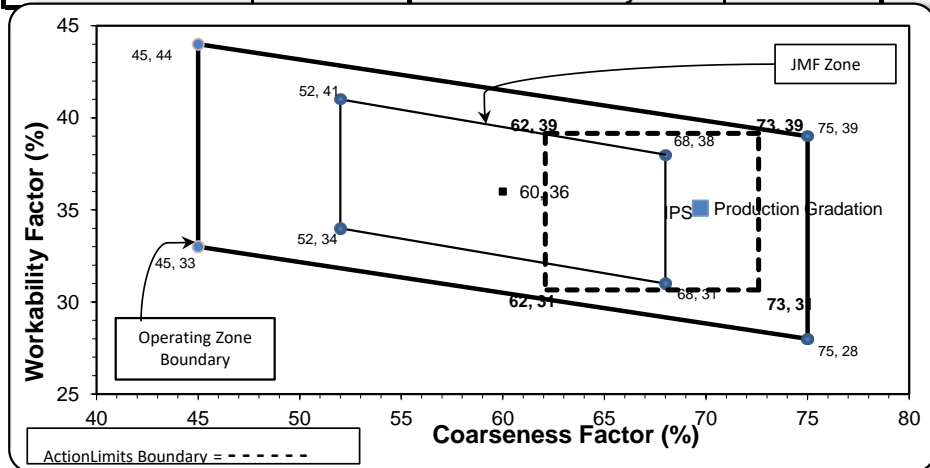
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 Suite 500
 Farmington Hills, MI 48336

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"	59.3	100.0	100.0	82.1	17.9	17.9
3/4"	32.1	100.0	100.0	70.2	11.9	29.8
1/2"	13.1	90.2	100.0	60.1	10.1	39.9
3/8"	7.3	74.2	100.0	54.7	5.4	45.3
#4	2.8	21.2	98.3	42.8	12.0	57.2
#8	1.9	7.6	85.6	35.1	7.7	64.9
#16	1.7	4.4	68.3	27.8	7.3	72.2
#30	1.5	3.4	48.1	19.8	8.0	80.2
#50	1.4	3.0	23.5	10.2	9.6	89.8
#100	1.3	2.8	4.9	2.9	7.2	97.1
LBW	1.1	2.5	0.5	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: **70** **Workability Factor:** **35**



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

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Aggregate Optimization Chart

PLANT #: 12

Sample Date: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3070	18.70		100.0

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



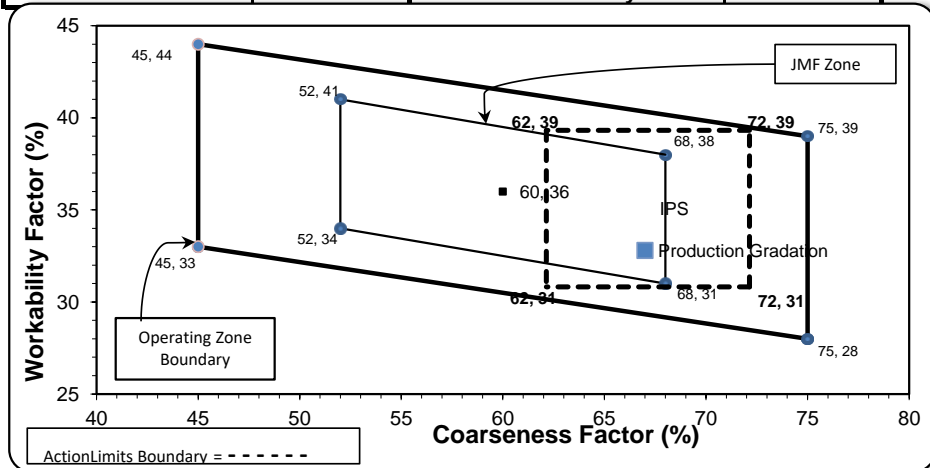
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.2	100.0	100.0	98.1	1.9	1.9
1"	33.5	100.0	100.0	77.9	20.2	22.1
3/4"	5.4	98.7	100.0	68.2	9.7	31.8
1/2"	2.5	77.4	100.0	61.3	6.9	38.7
3/8"	2.1	54.9	100.0	55.0	6.4	45.0
#4	1.8	10.3	96.4	41.1	13.9	58.9
#8	1.7	2.8	80.5	32.8	8.3	67.2
#16	1.6	2.1	64.4	26.3	6.5	73.7
#30	1.5	2.0	48.4	20.0	6.3	80.0
#50	1.4	1.8	24.1	10.4	9.6	89.6
#100	1.3	1.8	5.2	3.0	7.4	97.0
LBW	1.2	1.5	0.8	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: 67 **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

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Aggregate Optimization Chart

PLANT #: 20

Sample Date: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	950	5.81	2.62	30.9
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



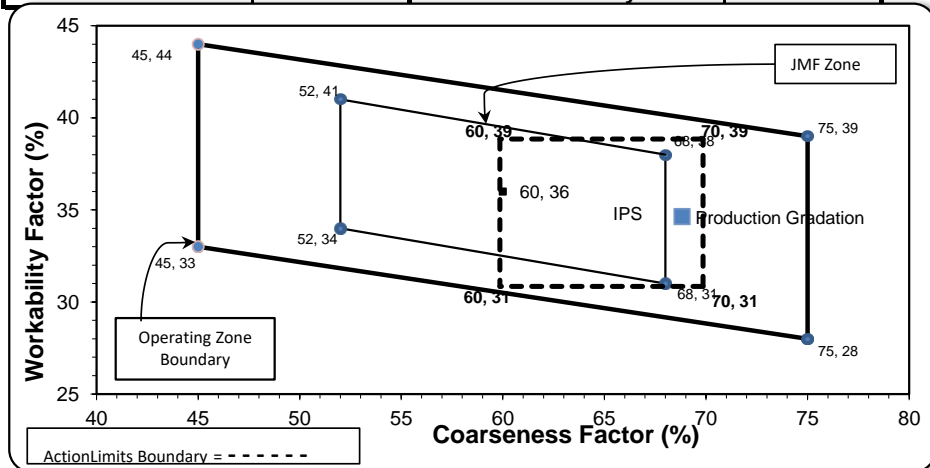
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 Suite 500
 Farmington Hills, MI 48336

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"	34.7	100.0	100.0	80.4	19.6	19.6
3/4"	12.6	97.8	100.0	73.1	7.3	26.9
1/2"	5.1	72.1	100.0	62.9	10.2	37.1
3/8"	4.0	47.6	100.0	55.0	7.9	45.0
#4	2.9	10.6	96.9	42.0	13.0	58.0
#8	2.6	3.8	83.6	34.6	7.4	65.4
#16	2.5	2.7	69.2	28.6	6.0	71.4
#30	2.4	2.5	48.4	20.4	8.2	79.6
#50	2.2	2.3	21.6	9.8	10.6	90.2
#100	2.0	2.2	4.0	2.8	7.0	97.2
LBW	1.6	1.8	1.2	1.5	1.3	98.5

*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:** 35



Initial Production Sample (IPS)

Coarseness Factor: <u>65</u>		Workability Factor: <u>35</u>	
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: 10/23/23

Concrete Grade: P1M, 3500HP

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



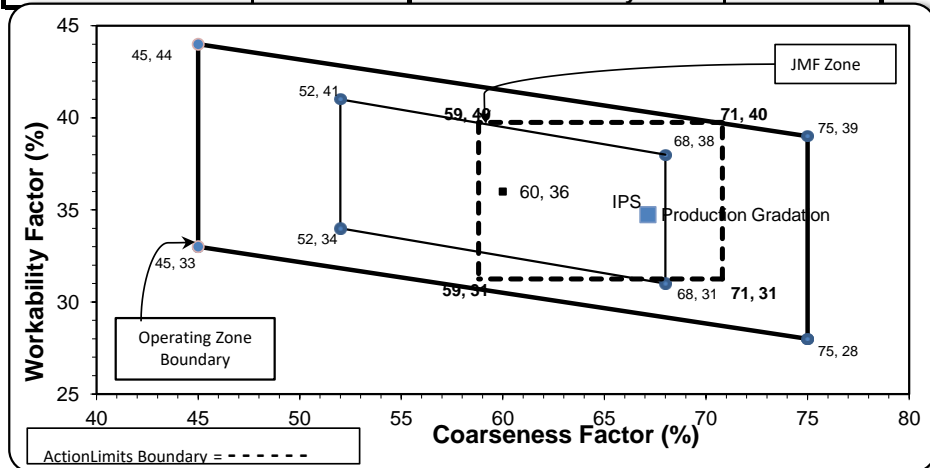
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.2	100.0	100.0	98.2	1.8	1.8
1"	33.5	100.0	100.0	79.4	18.8	20.6
3/4"	5.4	98.7	100.0	70.3	9.1	29.7
1/2"	2.5	77.4	100.0	63.1	7.3	36.9
3/8"	2.1	54.9	100.0	56.2	6.9	43.8
#4	1.8	10.3	96.7	41.4	14.7	58.6
#8	1.7	2.8	85.4	34.7	6.7	65.3
#16	1.6	2.1	70.6	28.7	6.0	71.3
#30	1.5	2.0	52.2	21.5	7.3	78.5
#50	1.4	1.8	24.8	10.7	10.8	89.3
#100	1.3	1.8	7.6	3.9	6.8	96.1
LBW	1.2	1.5	1.7	1.5	2.4	98.5

*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: 67 **Workability Factor:** 35



Initial Production Sample (IPS)

Coarseness Factor: <u>65</u>		Workability Factor: <u>36</u>	
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: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



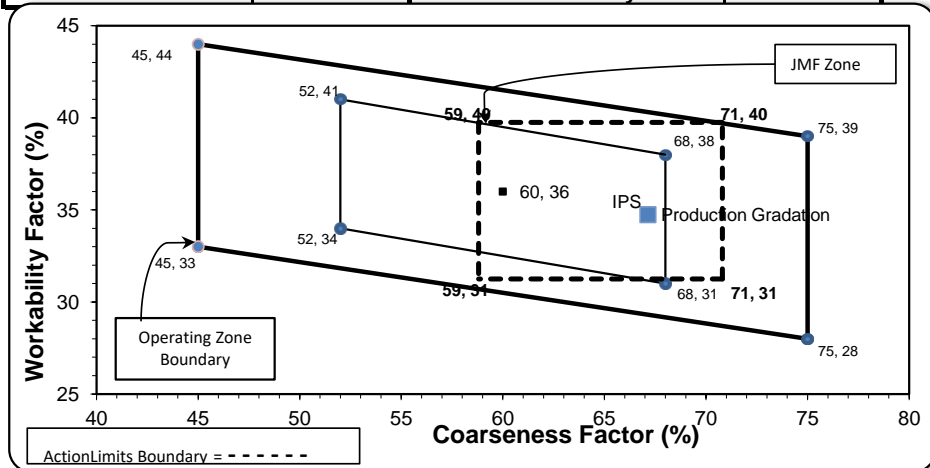
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.2	100.0	100.0	98.2	1.8	1.8
1"	33.5	100.0	100.0	79.4	18.8	20.6
3/4"	5.4	98.7	100.0	70.3	9.1	29.7
1/2"	2.5	77.4	100.0	63.1	7.3	36.9
3/8"	2.1	54.9	100.0	56.2	6.9	43.8
#4	1.8	10.3	96.7	41.4	14.7	58.6
#8	1.7	2.8	85.4	34.7	6.7	65.3
#16	1.6	2.1	70.6	28.7	6.0	71.3
#30	1.5	2.0	52.2	21.5	7.3	78.5
#50	1.4	1.8	24.8	10.7	10.8	89.3
#100	1.3	1.8	7.6	3.9	6.8	96.1
LBW	1.2	1.5	1.7	1.5	2.4	98.5

*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: **67** **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: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3120	18.70		100.0

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



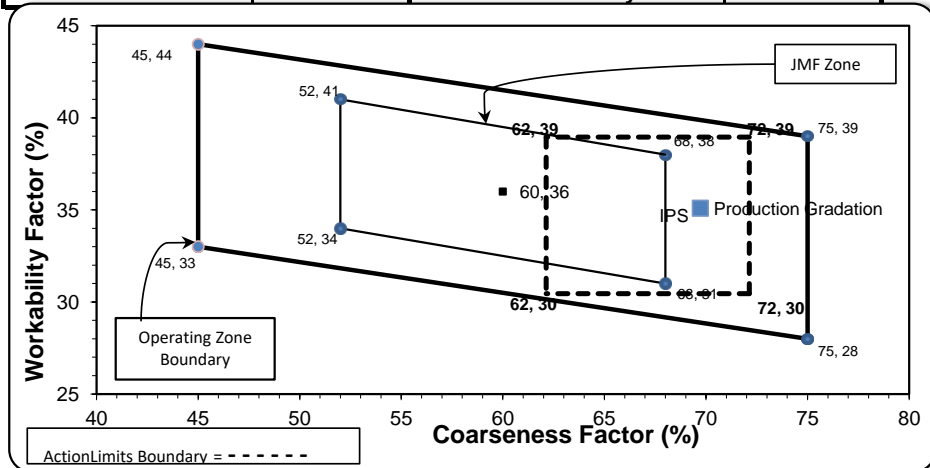
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	59.3	100.0	100.0	82.1	17.9	17.9
3/4"	32.1	100.0	100.0	70.2	11.9	29.8
1/2"	13.1	90.2	100.0	60.1	10.1	39.9
3/8"	7.3	74.2	100.0	54.7	5.4	45.3
#4	2.8	21.2	98.3	42.8	12.0	57.2
#8	1.9	7.6	85.6	35.1	7.7	64.9
#16	1.7	4.4	68.3	27.8	7.3	72.2
#30	1.5	3.4	48.1	19.8	8.0	80.2
#50	1.4	3.0	23.5	10.2	9.6	89.8
#100	1.3	2.8	4.9	2.9	7.2	97.1
LBW	1.1	2.5	0.5	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: **70** Workability Factor: **35**



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: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1000	6.12	2.62	32.6
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



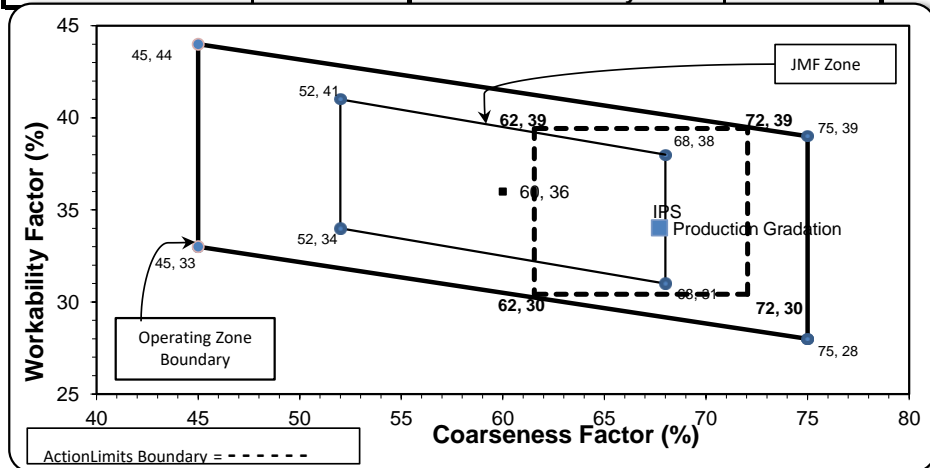
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.2	100.0	100.0	98.1	1.9	1.9
1"	33.5	100.0	100.0	78.3	19.8	21.7
3/4"	5.4	98.7	100.0	68.8	9.5	31.2
1/2"	2.5	77.4	100.0	61.8	7.0	38.2
3/8"	2.1	54.9	100.0	55.3	6.5	44.7
#4	1.8	10.3	96.9	41.4	13.9	58.6
#8	1.7	2.8	83.6	34.0	7.4	66.0
#16	1.6	2.1	69.2	28.2	5.9	71.8
#30	1.5	2.0	48.4	20.0	8.2	80.0
#50	1.4	1.8	21.6	9.4	10.6	90.6
#100	1.3	1.8	4.0	2.5	6.9	97.5
LBW	1.2	1.5	1.2	1.3	1.2	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"	85.0	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: 10/23/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/24/2023 through 10/30/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3070	18.69		100.0

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



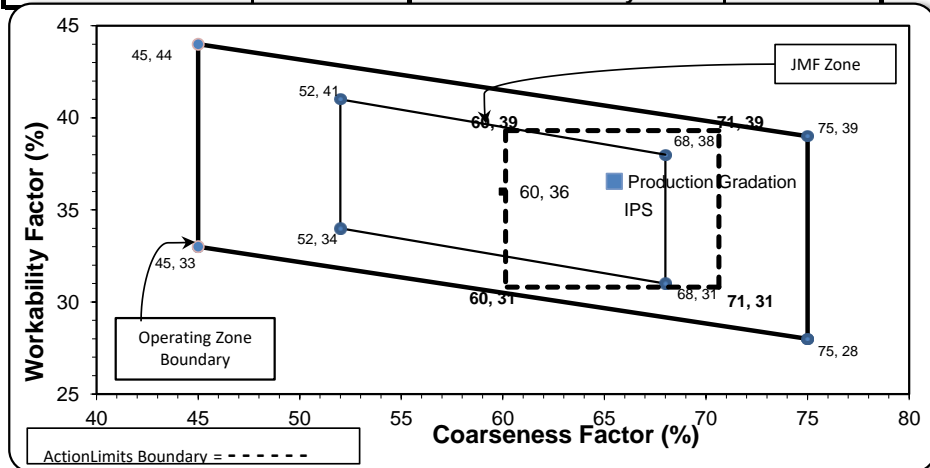
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.8	100.0	100.0	98.3	1.7	1.7
1"	34.4	100.0	100.0	78.2	20.1	21.8
3/4"	10.8	98.5	100.0	70.0	8.2	30.0
1/2"	3.9	83.2	100.0	63.7	6.3	36.3
3/8"	3.4	63.7	100.0	58.4	5.2	41.6
#4	3.0	17.3	98.8	45.7	12.7	54.3
#8	2.8	4.5	84.6	36.5	9.2	63.5
#16	2.7	2.7	68.9	29.7	6.9	70.3
#30	2.6	2.3	50.2	21.9	7.8	78.1
#50	2.5	2.1	21.6	10.2	11.7	89.8
#100	2.2	1.9	4.5	3.1	7.1	96.9
LBW	1.8	1.7	0.7	1.3	1.7	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:** 37



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: 10/23/23

Concrete Grade: **P1M, 3500HP**

Contractor: _____

Dates Test Represents: 10/24/2023 through 10/30/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3070	18.70		100.0

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



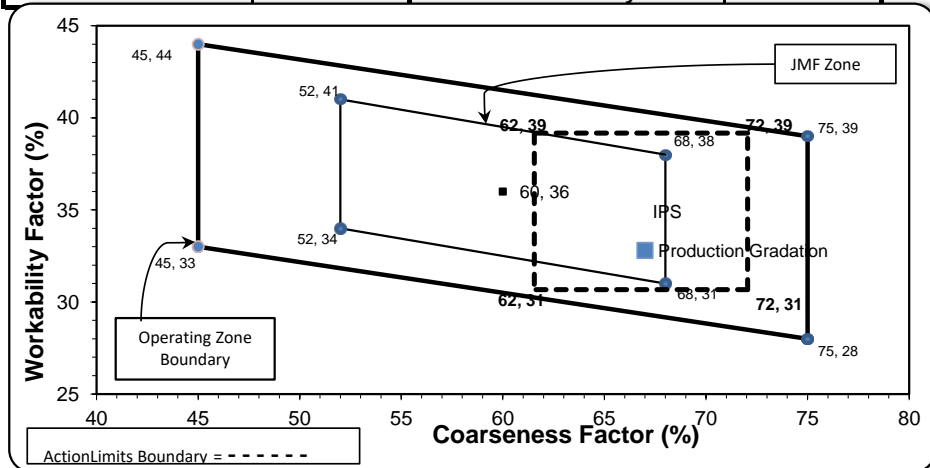
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 30701 W. 10 Mile Rd.
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.2	100.0	100.0	98.1	1.9	1.9
1"	33.5	100.0	100.0	77.9	20.2	22.1
3/4"	5.4	98.7	100.0	68.2	9.7	31.8
1/2"	2.5	77.4	100.0	61.3	6.9	38.7
3/8"	2.1	54.9	100.0	55.0	6.4	45.0
#4	1.8	10.3	96.4	41.1	13.9	58.9
#8	1.7	2.8	80.5	32.8	8.3	67.2
#16	1.6	2.1	64.4	26.3	6.5	73.7
#30	1.5	2.0	48.4	20.0	6.3	80.0
#50	1.4	1.8	24.1	10.4	9.6	89.6
#100	1.3	1.8	5.2	3.0	7.4	97.0
LBW	1.2	1.5	0.8	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: **67** **Workability Factor:** **33**



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: