

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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	96.4	43.2	13.6	56.8
#8	2.8	4.5	81.2	33.9	9.3	66.1
#16	2.7	2.7	66.2	27.5	6.4	72.5
#30	2.6	2.3	51.8	21.8	5.8	78.2
#50	2.5	2.1	26.8	11.9	9.9	88.1
#100	2.2	1.9	6.6	3.8	8.1	96.2
LBW	1.8	1.7	0.7	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.

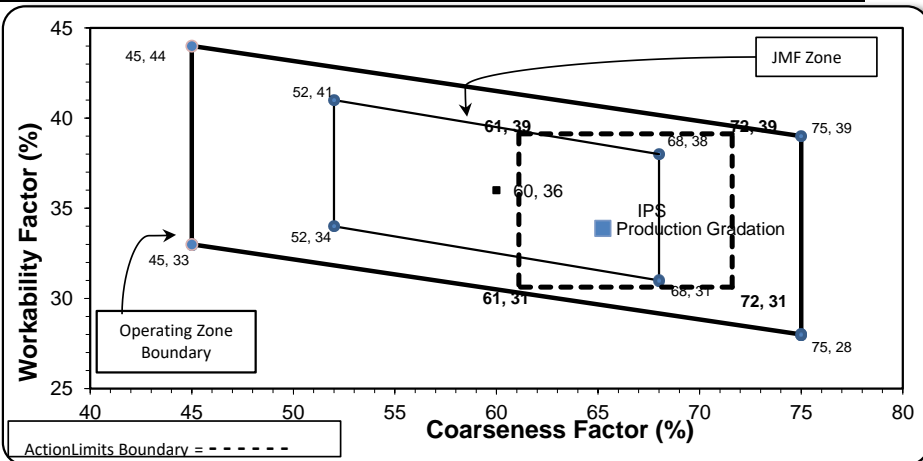
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	65	Workability Factor:	34
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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: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



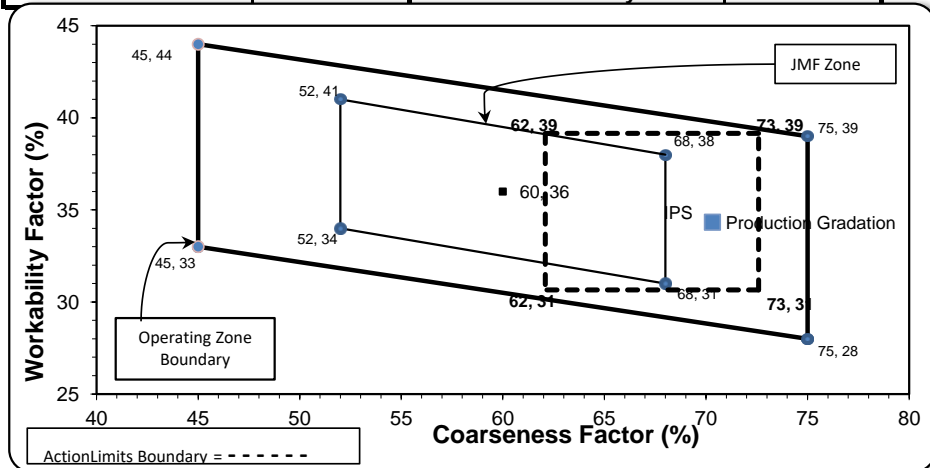
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 Suite 500
 Farmington Hills, MI 48336

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"	61.1	100.0	100.0	82.9	17.1	17.1
3/4"	36.0	100.0	100.0	71.9	11.0	28.1
1/2"	8.0	91.5	100.0	58.1	13.8	41.9
3/8"	5.0	74.7	100.0	53.8	4.3	46.2
#4	2.4	19.9	98.0	42.3	11.6	57.7
#8	2.2	5.8	84.1	34.3	7.9	65.7
#16	2.0	3.6	66.0	26.9	7.4	73.1
#30	1.9	2.9	45.1	18.7	8.2	81.3
#50	1.8	2.5	19.9	8.9	9.8	91.1
#100	1.7	2.4	3.3	2.4	6.4	97.6
LBW	1.4	2.1	0.4	1.1	1.3	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:** 34



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"	85.5	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: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



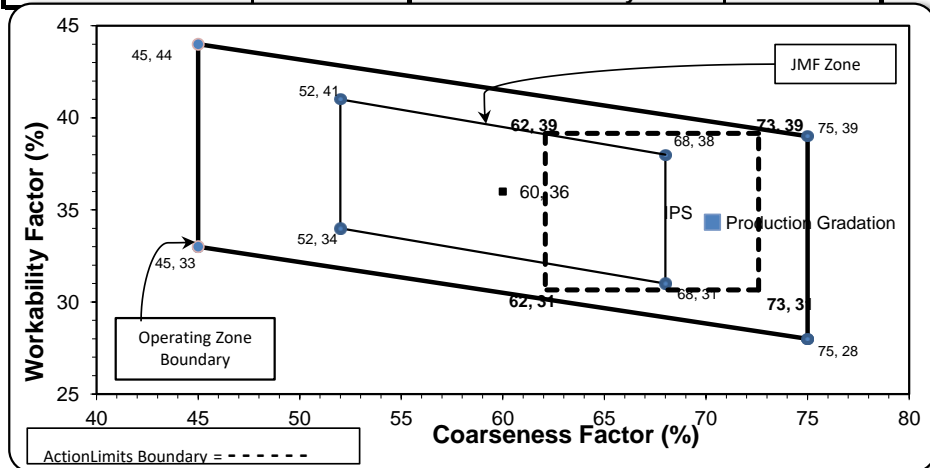
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 Farmington Hills, MI 48336

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"	61.1	100.0	100.0	82.9	17.1	17.1
3/4"	36.0	100.0	100.0	71.9	11.0	28.1
1/2"	8.0	91.5	100.0	58.1	13.8	41.9
3/8"	5.0	74.7	100.0	53.8	4.3	46.2
#4	2.4	19.9	98.0	42.3	11.6	57.7
#8	2.2	5.8	84.1	34.3	7.9	65.7
#16	2.0	3.6	66.0	26.9	7.4	73.1
#30	1.9	2.9	45.1	18.7	8.2	81.3
#50	1.8	2.5	19.9	8.9	9.8	91.1
#100	1.7	2.4	3.3	2.4	6.4	97.6
LBW	1.4	2.1	0.4	1.1	1.3	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: **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:
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Aggregate Optimization Chart

PLANT #: 12

Sample Date: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



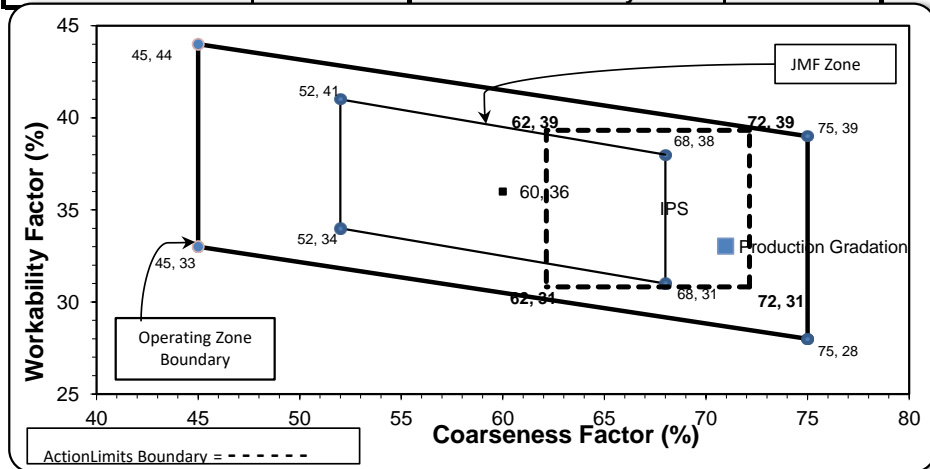
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.4	0.6	0.6
1"	62.9	100.0	100.0	87.7	11.7	12.3
3/4"	25.3	97.4	100.0	74.5	13.2	25.5
1/2"	8.0	68.4	100.0	60.7	13.8	39.3
3/8"	5.4	41.9	100.0	52.5	8.2	47.5
#4	3.5	6.5	96.7	40.8	11.7	59.2
#8	2.9	2.2	80.5	33.0	7.7	67.0
#16	2.7	1.8	64.2	26.5	6.5	73.5
#30	2.7	1.7	48.8	20.4	6.0	79.6
#50	2.6	1.6	25.9	11.4	9.0	88.6
#100	2.4	1.6	5.2	3.3	8.2	96.7
LBW	2.0	1.3	0.6	1.3	2.0	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: 71 **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"	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:
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Aggregate Optimization Chart

PLANT #: P11

Sample Date: 10/30/23

Concrete Grade: P1M, 3500HP

Dates Test Represents: 10/31/2023 through 11/6/2023

Contractor: _____

MDOT No.: _____

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

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



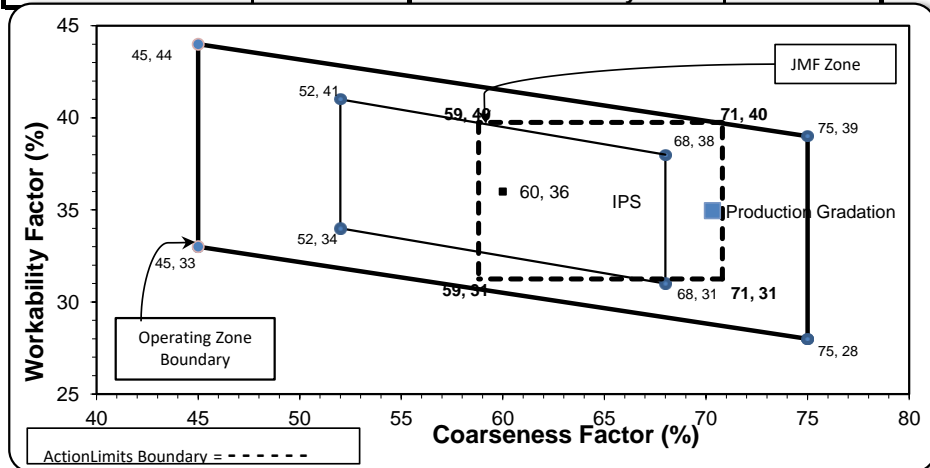
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.5	0.5	0.5
1"	62.9	100.0	100.0	89.5	10.0	10.5
3/4"	25.3	97.4	100.0	78.0	11.5	22.0
1/2"	8.0	68.4	100.0	63.6	14.3	36.4
3/8"	5.4	41.9	100.0	54.3	9.4	45.7
#4	3.5	6.5	96.5	40.8	13.4	59.2
#8	2.9	2.2	85.5	35.0	5.9	65.0
#16	2.7	1.8	70.7	29.0	6.0	71.0
#30	2.7	1.7	50.9	21.2	7.8	78.8
#50	2.6	1.6	25.1	11.1	10.1	88.9
#100	2.4	1.6	7.3	4.1	7.0	95.9
LBW	2.0	1.3	1.3	1.5	2.6	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: **70** 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: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

Contractor: _____

MDOT No.: _____

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

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



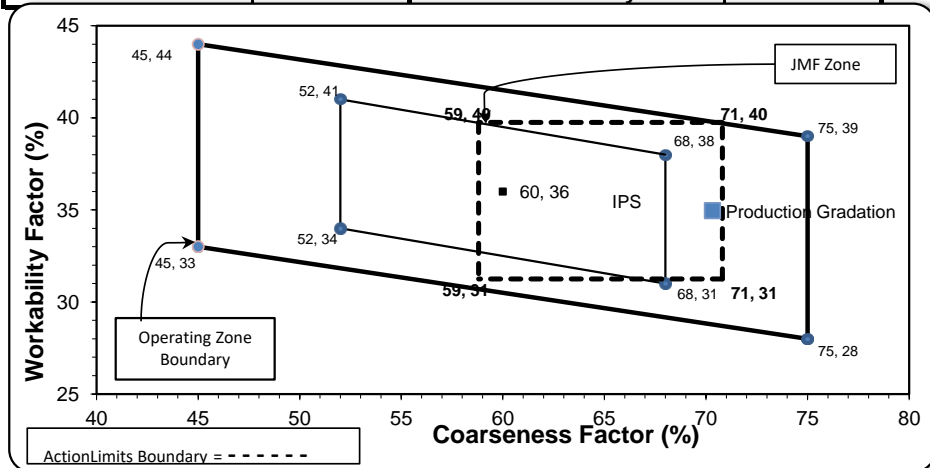
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.5	0.5	0.5
1"	62.9	100.0	100.0	89.5	10.0	10.5
3/4"	25.3	97.4	100.0	78.0	11.5	22.0
1/2"	8.0	68.4	100.0	63.6	14.3	36.4
3/8"	5.4	41.9	100.0	54.3	9.4	45.7
#4	3.5	6.5	96.5	40.8	13.4	59.2
#8	2.9	2.2	85.5	35.0	5.9	65.0
#16	2.7	1.8	70.7	29.0	6.0	71.0
#30	2.7	1.7	50.9	21.2	7.8	78.8
#50	2.6	1.6	25.1	11.1	10.1	88.9
#100	2.4	1.6	7.3	4.1	7.0	95.9
LBW	2.0	1.3	1.3	1.5	2.6	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: **70** 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: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



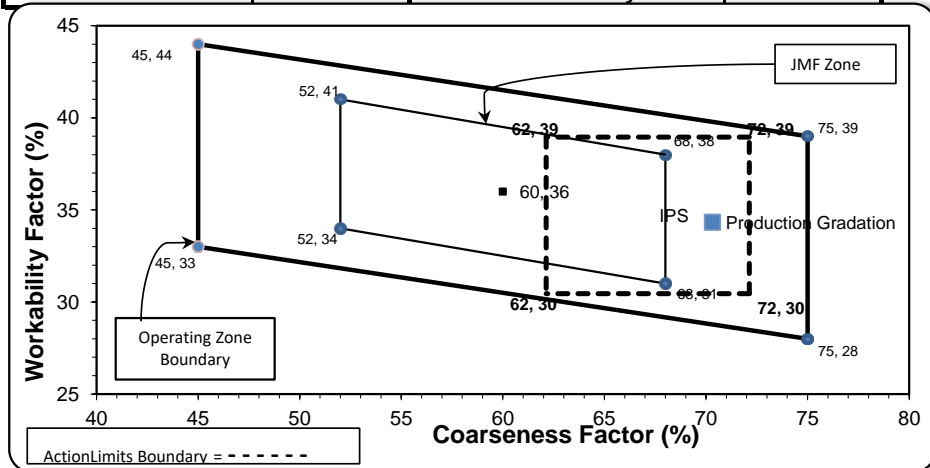
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	61.1	100.0	100.0	82.9	17.1	17.1
3/4"	36.0	100.0	100.0	71.9	11.0	28.1
1/2"	8.0	91.5	100.0	58.1	13.8	41.9
3/8"	5.0	74.7	100.0	53.8	4.3	46.2
#4	2.4	19.9	98.0	42.3	11.6	57.7
#8	2.2	5.8	84.1	34.3	7.9	65.7
#16	2.0	3.6	66.0	26.9	7.4	73.1
#30	1.9	2.9	45.1	18.7	8.2	81.3
#50	1.8	2.5	19.9	8.9	9.8	91.1
#100	1.7	2.4	3.3	2.4	6.4	97.6
LBW	1.4	2.1	0.4	1.1	1.3	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:** 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: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



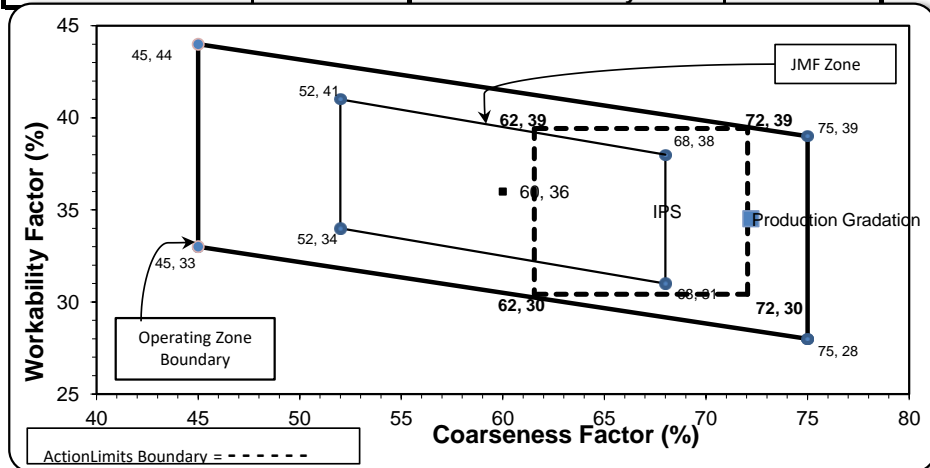
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.4	0.6	0.6
1"	62.9	100.0	100.0	87.9	11.5	12.1
3/4"	25.3	97.4	100.0	74.9	13.0	25.1
1/2"	8.0	68.4	100.0	61.1	13.9	38.9
3/8"	5.4	41.9	100.0	52.7	8.4	47.3
#4	3.5	6.5	97.3	41.0	11.7	59.0
#8	2.9	2.2	84.3	34.5	6.5	65.5
#16	2.7	1.8	69.2	28.4	6.1	71.6
#30	2.7	1.7	49.1	20.6	7.9	79.4
#50	2.6	1.6	19.9	9.1	11.5	90.9
#100	2.4	1.6	3.7	2.7	6.4	97.3
LBW	2.0	1.3	1.1	1.4	1.2	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: **72** **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"	85.0	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-38**

Sample Date: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1320	7.86	2.69	42.3
IA	58-003	Stoneco	550	3.28	2.69	17.6
2NS	81-019	Pleasant Lake	1250	7.56	2.65	40.1
Total Wt			3120	18.70		100.0

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



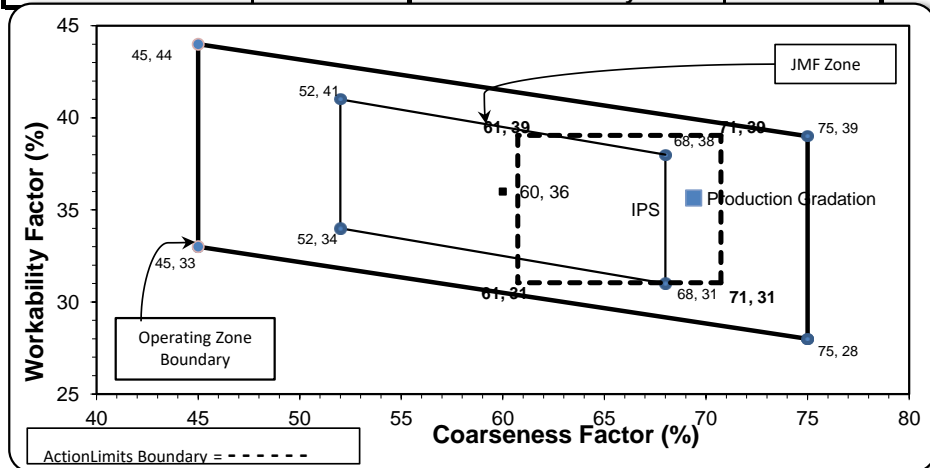
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	61.1	100.0	100.0	83.5	16.5	16.5
3/4"	36.0	100.0	100.0	72.9	10.6	27.1
1/2"	8.0	91.5	100.0	59.6	13.3	40.4
3/8"	5.0	74.7	100.0	55.3	4.2	44.7
#4	2.4	19.9	98.0	43.8	11.6	56.2
#8	2.2	5.8	84.1	35.6	8.1	64.4
#16	2.0	3.6	66.0	27.9	7.7	72.1
#30	1.9	2.9	45.1	19.4	8.5	80.6
#50	1.8	2.5	19.9	9.2	10.2	90.8
#100	1.7	2.4	3.3	2.5	6.7	97.5
LBW	1.4	2.1	0.4	1.1	1.3	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: 69 **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"	100.0	0.0	0.0
1"	84.2	15.8	15.8
3/4"	77.9	6.3	22.1
1/2"	60.9	17.0	39.1
3/8"	57.3	3.6	42.7
#4	43.9	13.4	56.1
#8	35.0	8.9	65.0
#16	27.6	7.4	72.4
#30	19.7	7.9	80.3
#50	9.1	10.6	90.9
#100	2.0	7.1	98.0
LBW	0.9	1.2	99.1

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



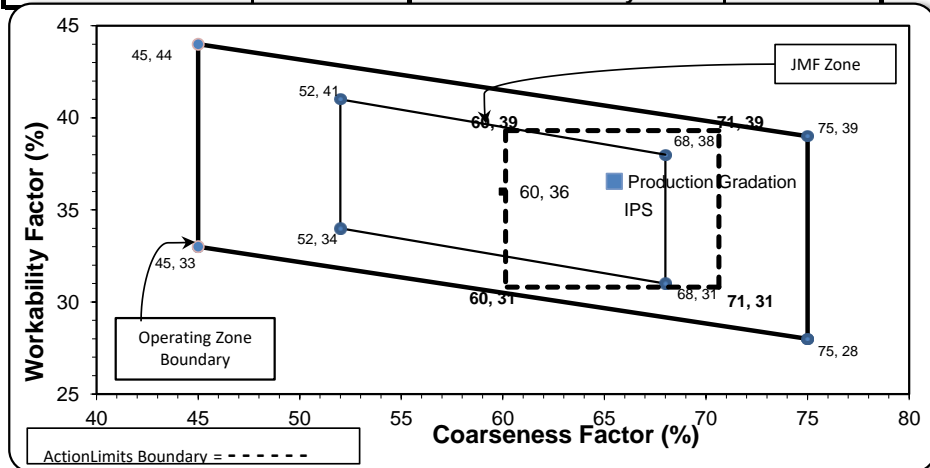
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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	98.3	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: 10/30/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 10/31/2023 through 11/6/2023

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%



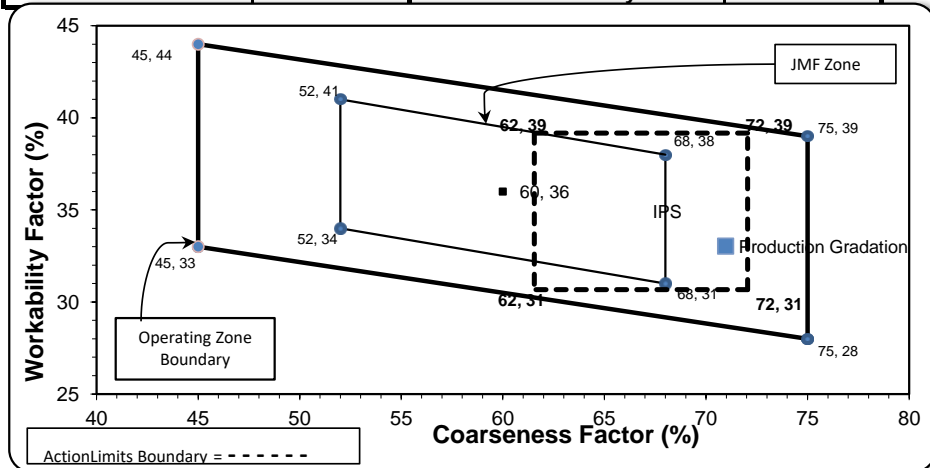
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.4	0.6	0.6
1"	62.9	100.0	100.0	87.7	11.7	12.3
3/4"	25.3	97.4	100.0	74.5	13.2	25.5
1/2"	8.0	68.4	100.0	60.7	13.8	39.3
3/8"	5.4	41.9	100.0	52.5	8.2	47.5
#4	3.5	6.5	96.7	40.8	11.7	59.2
#8	2.9	2.2	80.5	33.0	7.7	67.0
#16	2.7	1.8	64.2	26.5	6.5	73.5
#30	2.7	1.7	48.8	20.4	6.0	79.6
#50	2.6	1.6	25.9	11.4	9.0	88.6
#100	2.4	1.6	5.2	3.3	8.2	96.7
LBW	2.0	1.3	0.6	1.3	2.0	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: **71** **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: