

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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"	94.3	100.0	100.0	98.0	2.0	2.0
1"	39.3	100.0	100.0	78.8	19.2	21.2
3/4"	8.8	98.5	100.0	67.8	11.0	32.2
1/2"	3.3	83.2	100.0	61.9	5.9	38.1
3/8"	2.5	63.7	100.0	56.6	5.4	43.4
#4	2.1	17.3	96.5	43.0	13.6	57.0
#8	2.0	4.5	81.8	33.8	9.1	66.2
#16	1.9	2.7	67.1	27.6	6.2	72.4
#30	1.9	2.3	51.6	21.4	6.2	78.6
#50	1.8	2.1	27.7	12.0	9.4	88.0
#100	1.7	1.9	7.5	4.0	8.0	96.0
LBW	1.4	1.7	1.0	1.3	2.7	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

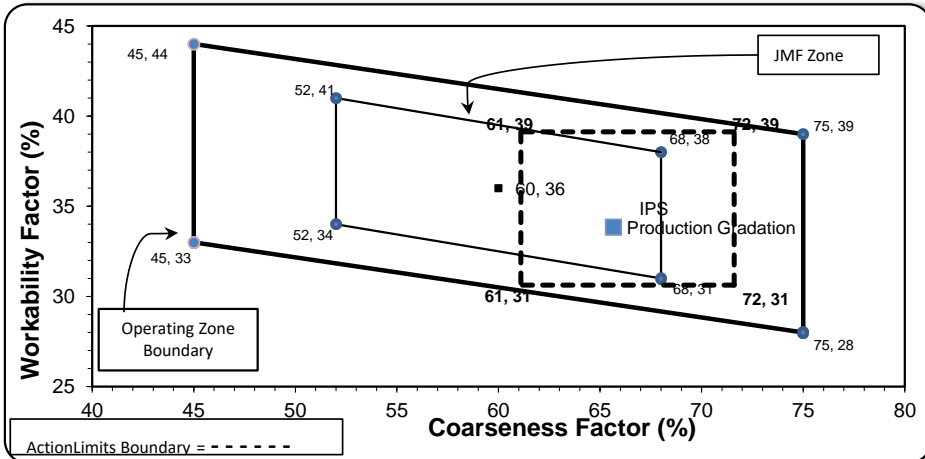
Coarseness Factor:	66	Workability Factor:	34
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Initial Production Sample (IPS)

Coarseness Factor:	66
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Workability Factor:	35
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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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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%



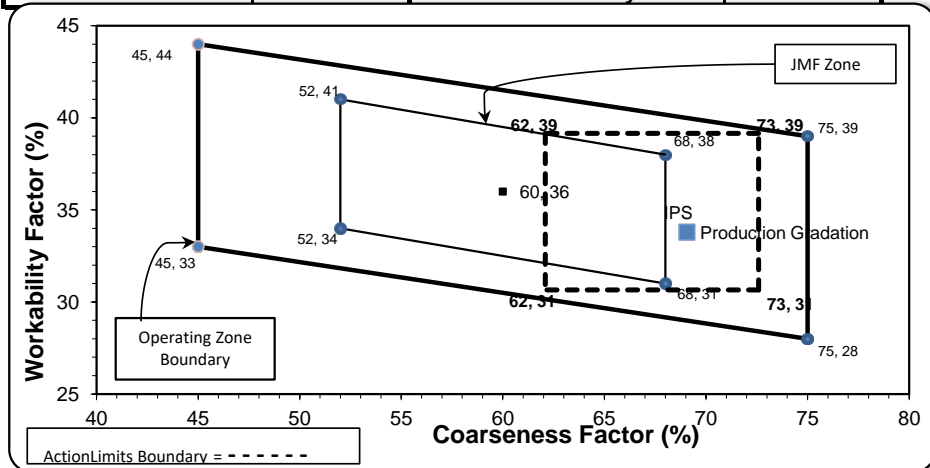
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	64.2	100.0	100.0	84.3	15.7	15.7
3/4"	40.0	100.0	100.0	73.7	10.6	26.3
1/2"	16.1	91.2	100.0	61.6	12.0	38.4
3/8"	7.6	70.8	100.0	54.3	7.3	45.7
#4	2.6	16.4	98.5	41.9	12.4	58.1
#8	1.3	5.6	83.8	33.8	8.1	66.2
#16	1.0	3.2	66.2	26.5	7.3	73.5
#30	1.0	2.3	46.5	18.7	7.7	81.3
#50	1.0	2.1	22.7	9.5	9.2	90.5
#100	0.9	2.0	6.0	3.1	6.5	96.9
LBW	0.8	1.7	1.0	1.0	2.0	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

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 #: **P-103**

Sample Date: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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%



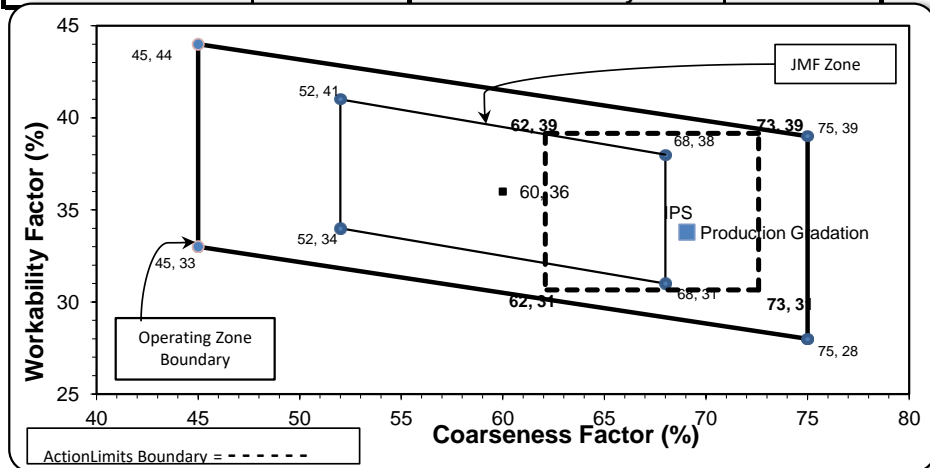
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	64.2	100.0	100.0	84.3	15.7	15.7
3/4"	40.0	100.0	100.0	73.7	10.6	26.3
1/2"	16.1	91.2	100.0	61.6	12.0	38.4
3/8"	7.6	70.8	100.0	54.3	7.3	45.7
#4	2.6	16.4	98.5	41.9	12.4	58.1
#8	1.3	5.6	83.8	33.8	8.1	66.2
#16	1.0	3.2	66.2	26.5	7.3	73.5
#30	1.0	2.3	46.5	18.7	7.7	81.3
#50	1.0	2.1	22.7	9.5	9.2	90.5
#100	0.9	2.0	6.0	3.1	6.5	96.9
LBW	0.8	1.7	1.0	1.0	2.0	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

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:
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Aggregate Optimization Chart

PLANT #: 14

Sample Date: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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	19-04	Schlegel	1200	7.20	2.67	38.5
Total Wt			3120	18.64		100.0

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



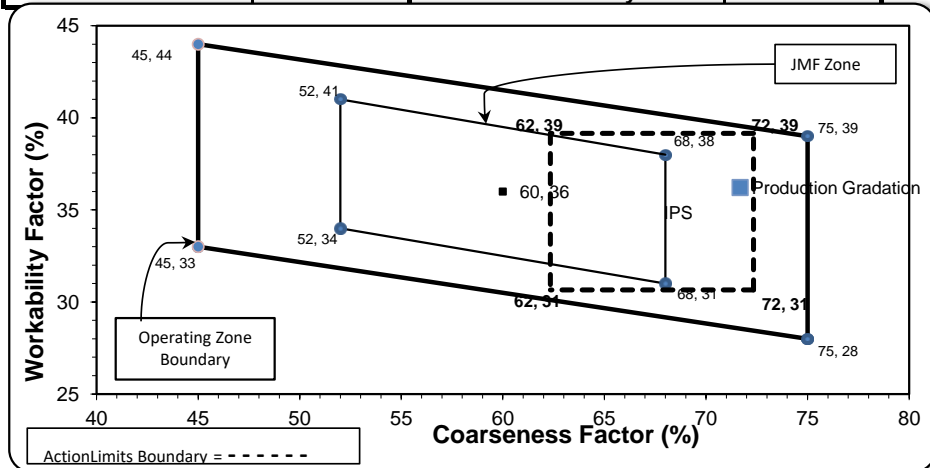
Builders Redi-Mix
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	64.2	100.0	100.0	84.3	15.7	15.7
3/4"	40.0	100.0	100.0	73.7	10.6	26.3
1/2"	16.1	91.2	100.0	61.6	12.0	38.4
3/8"	7.6	70.8	100.0	54.3	7.3	45.7
#4	2.6	16.4	99.9	42.5	11.8	57.5
#8	1.3	5.6	90.1	36.2	6.2	63.8
#16	1.0	3.2	69.4	27.7	8.5	72.3
#30	1.0	2.3	44.5	18.0	9.7	82.0
#50	1.0	2.1	14.3	6.3	11.7	93.7
#100	0.9	2.0	2.7	1.8	4.5	98.2
LBW	0.8	1.7	0.2	0.7	1.1	99.3

*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

Coarseness Factor:	72	Workability Factor:	36
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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: 6/26/23

Dates Test Represents: 6/27/2023 through 7/3/2023

Concrete Grade: **P1M, 3500HP**

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	750	4.59	2.62	24.4
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



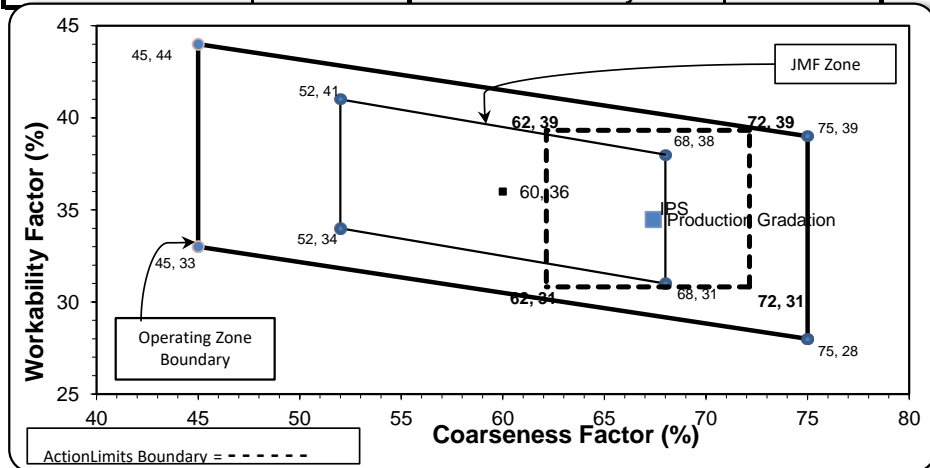
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.2	100.0	100.0	99.0	1.0	1.0
1"	39.5	100.0	100.0	78.9	20.1	21.1
3/4"	14.1	98.7	100.0	69.7	9.2	30.3
1/2"	4.0	78.5	100.0	61.3	8.5	38.7
3/8"	3.0	57.6	100.0	55.8	5.5	44.2
#4	2.4	12.9	96.5	43.3	12.6	56.7
#8	2.2	4.0	80.4	34.5	8.8	65.5
#16	2.1	2.8	65.1	27.9	6.6	72.1
#30	2.0	2.6	49.5	21.5	6.4	78.5
#50	2.0	2.5	25.6	11.7	9.8	88.3
#100	1.9	2.3	4.8	3.2	8.6	96.8
LBW	1.4	2.0	0.7	1.3	1.9	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:	67	Workability Factor:	34
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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 #: 20

Sample Date: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



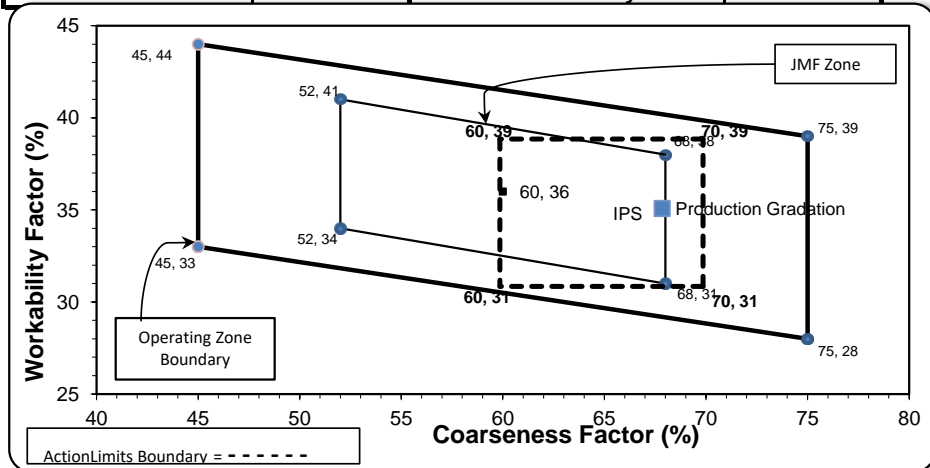
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	37.6	100.0	100.0	80.3	18.7	19.7
3/4"	11.1	98.8	100.0	71.6	8.7	28.4
1/2"	3.9	76.7	100.0	62.8	8.8	37.2
3/8"	2.9	54.4	100.0	56.0	6.9	44.0
#4	2.1	13.4	97.2	42.6	13.4	57.4
#8	1.9	4.8	84.6	35.1	7.5	64.9
#16	1.9	3.1	71.0	29.3	5.8	70.7
#30	1.8	2.7	52.0	21.7	7.6	78.3
#50	1.7	2.5	19.8	9.0	12.7	91.0
#100	1.7	2.4	3.5	2.6	6.4	97.4
LBW	1.3	2.0	0.6	1.2	1.4	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:	68	Workability Factor:	35
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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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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	750	4.59	2.62	24.4
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



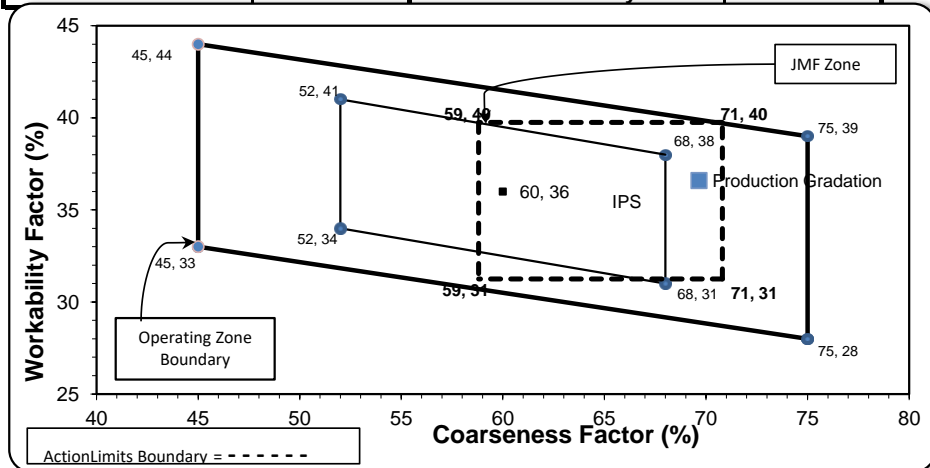
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.2	100.0	100.0	99.0	1.0	1.0
1"	39.5	100.0	100.0	78.9	20.1	21.1
3/4"	14.1	98.7	100.0	69.7	9.2	30.3
1/2"	4.0	78.5	100.0	61.3	8.5	38.7
3/8"	3.0	57.6	100.0	55.8	5.5	44.2
#4	2.4	12.9	96.4	43.2	12.6	56.8
#8	2.2	4.0	85.6	36.6	6.6	63.4
#16	2.1	2.8	71.2	30.4	6.2	69.6
#30	2.0	2.6	51.0	22.1	8.3	77.9
#50	2.0	2.5	25.4	11.6	10.4	88.4
#100	1.9	2.3	7.6	4.3	7.3	95.7
LBW	1.4	2.0	1.4	1.5	2.8	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: **37**



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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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	750	4.59	2.62	24.4
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



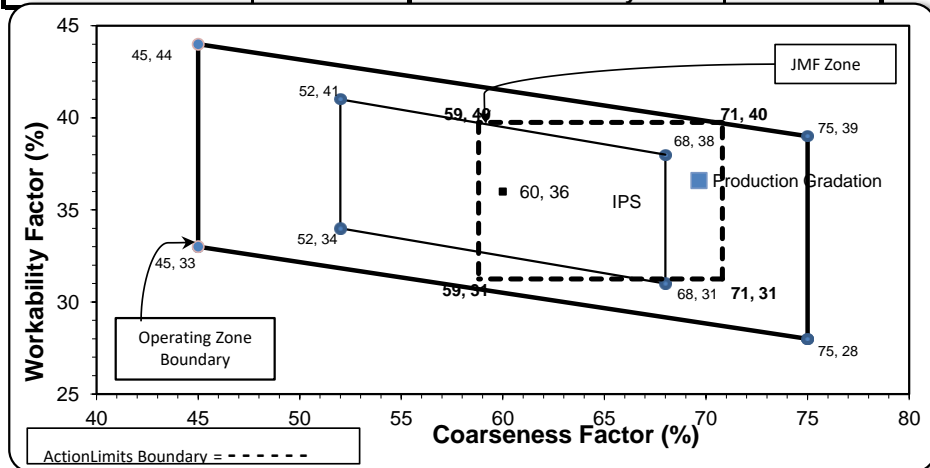
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.2	100.0	100.0	99.0	1.0	1.0
1"	39.5	100.0	100.0	78.9	20.1	21.1
3/4"	14.1	98.7	100.0	69.7	9.2	30.3
1/2"	4.0	78.5	100.0	61.3	8.5	38.7
3/8"	3.0	57.6	100.0	55.8	5.5	44.2
#4	2.4	12.9	96.4	43.2	12.6	56.8
#8	2.2	4.0	85.6	36.6	6.6	63.4
#16	2.1	2.8	71.2	30.4	6.2	69.6
#30	2.0	2.6	51.0	22.1	8.3	77.9
#50	2.0	2.5	25.4	11.6	10.4	88.4
#100	1.9	2.3	7.6	4.3	7.3	95.7
LBW	1.4	2.0	1.4	1.5	2.8	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: **37**



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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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%



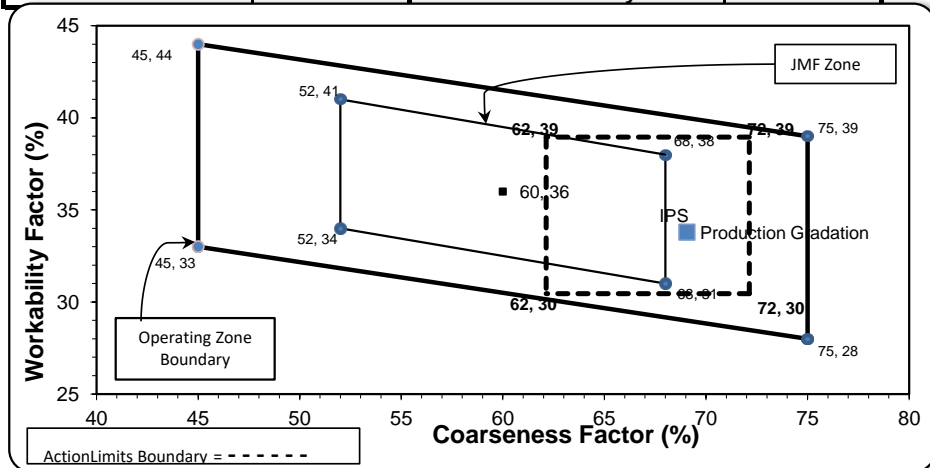
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 Farmington Hills, MI 48336

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"	64.2	100.0	100.0	84.3	15.7	15.7
3/4"	40.0	100.0	100.0	73.7	10.6	26.3
1/2"	16.1	91.2	100.0	61.6	12.0	38.4
3/8"	7.6	70.8	100.0	54.3	7.3	45.7
#4	2.6	16.4	98.5	41.9	12.4	58.1
#8	1.3	5.6	83.8	33.8	8.1	66.2
#16	1.0	3.2	66.2	26.5	7.3	73.5
#30	1.0	2.3	46.5	18.7	7.7	81.3
#50	1.0	2.1	22.7	9.5	9.2	90.5
#100	0.9	2.0	6.0	3.1	6.5	96.9
LBW	0.8	1.7	1.0	1.0	2.0	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

Coarseness Factor:	69	Workability Factor:	34
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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"	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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

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	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



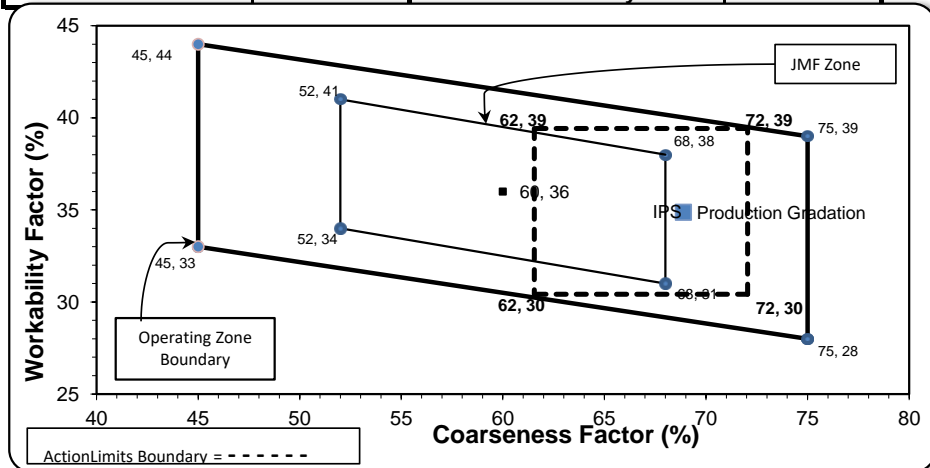
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.2	100.0	100.0	99.0	1.0	1.0
1"	39.5	100.0	100.0	78.9	20.1	21.1
3/4"	14.1	98.7	100.0	69.7	9.2	30.3
1/2"	4.0	78.5	100.0	60.9	8.8	39.1
3/8"	3.0	57.6	100.0	55.1	5.8	44.9
#4	2.4	12.9	97.2	42.2	13.0	57.8
#8	2.2	4.0	84.6	34.9	7.3	65.1
#16	2.1	2.8	71.0	29.2	5.7	70.8
#30	2.0	2.6	52.0	21.7	7.5	78.3
#50	2.0	2.5	19.8	9.1	12.6	90.9
#100	1.9	2.3	3.5	2.6	6.5	97.4
LBW	1.4	2.0	0.6	1.2	1.4	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:	69	Workability Factor:	35
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Intial 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"	85.0	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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Contractor: _____

Dates Test Represents: 6/27/2023 through 7/3/2023

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	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%



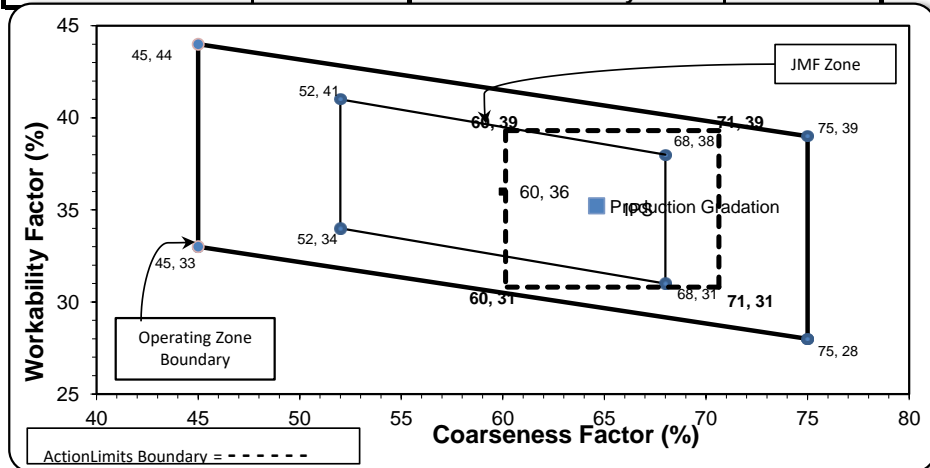
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.3	100.0	100.0	98.1	1.9	1.9
1"	39.3	100.0	100.0	79.8	18.3	20.2
3/4"	8.8	98.5	100.0	69.3	10.5	30.7
1/2"	3.3	83.2	100.0	63.5	5.8	36.5
3/8"	2.5	63.7	100.0	58.1	5.3	41.9
#4	2.1	17.3	95.8	44.2	13.9	55.8
#8	2.0	4.5	82.0	35.2	9.0	64.8
#16	1.9	2.7	67.7	28.9	6.3	71.1
#30	1.9	2.3	50.6	21.8	7.1	78.2
#50	1.8	2.1	22.8	10.4	11.4	89.6
#100	1.7	1.9	5.4	3.3	7.2	96.7
LBW	1.4	1.7	1.0	1.3	1.9	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:** **35**



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: 6/26/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 6/27/2023 through 7/3/2023

Contractor: _____

MDOT No.: _____



Superior Materials, LLC
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 Farmington Hills, MI 48336

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	750	4.59	2.62	24.4
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

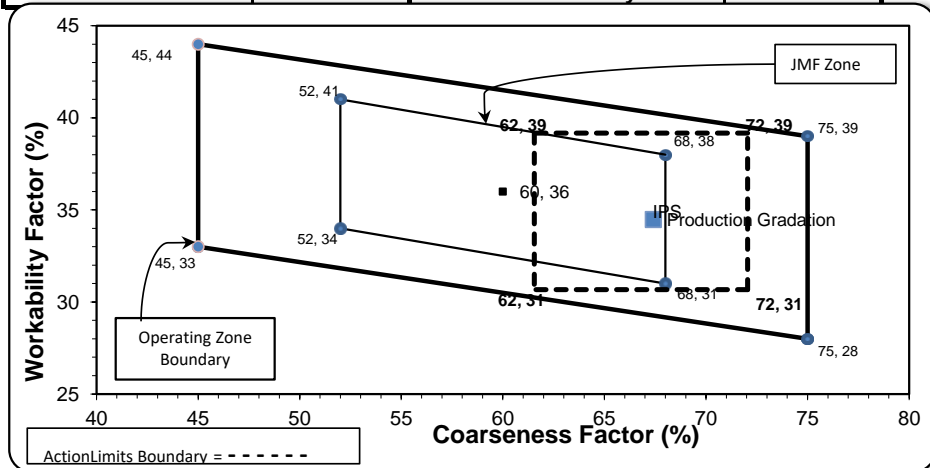
<----- Verify this number is 100%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.2	100.0	100.0	99.0	1.0	1.0
1"	39.5	100.0	100.0	78.9	20.1	21.1
3/4"	14.1	98.7	100.0	69.7	9.2	30.3
1/2"	4.0	78.5	100.0	61.3	8.5	38.7
3/8"	3.0	57.6	100.0	55.8	5.5	44.2
#4	2.4	12.9	96.5	43.3	12.6	56.7
#8	2.2	4.0	80.4	34.5	8.8	65.5
#16	2.1	2.8	65.1	27.9	6.6	72.1
#30	2.0	2.6	49.5	21.5	6.4	78.5
#50	2.0	2.5	25.6	11.7	9.8	88.3
#100	1.9	2.3	4.8	3.2	8.6	96.8
LBW	1.4	2.0	0.7	1.3	1.9	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:	67	Workability Factor:	34
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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: