

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 7/31/23

Concrete Grade: **P1M, 3500HP**

Contractor: _____

Dates Test Represents: 8/1/2023 through 8/7/2023

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"	98.2	100.0	100.0	99.4	0.6	0.6
1"	36.5	100.0	100.0	77.9	21.5	22.1
3/4"	10.8	98.5	100.0	68.5	9.3	31.5
1/2"	3.4	83.2	100.0	62.0	6.6	38.0
3/8"	2.6	63.7	100.0	56.6	5.4	43.4
#4	2.3	17.3	96.8	43.1	13.4	56.9
#8	2.3	4.5	82.9	34.4	8.8	65.6
#16	2.2	2.7	68.5	28.2	6.1	71.8
#30	2.1	2.3	52.0	21.7	6.6	78.3
#50	2.0	2.1	24.2	10.7	11.0	89.3
#100	1.9	1.9	5.9	3.5	7.2	96.5
LBW	1.5	1.7	1.3	1.5	2.0	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.

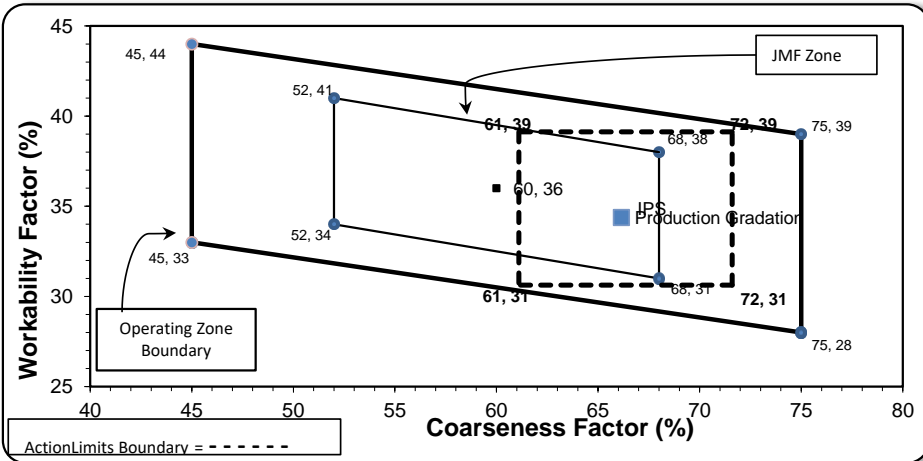
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	66	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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

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%



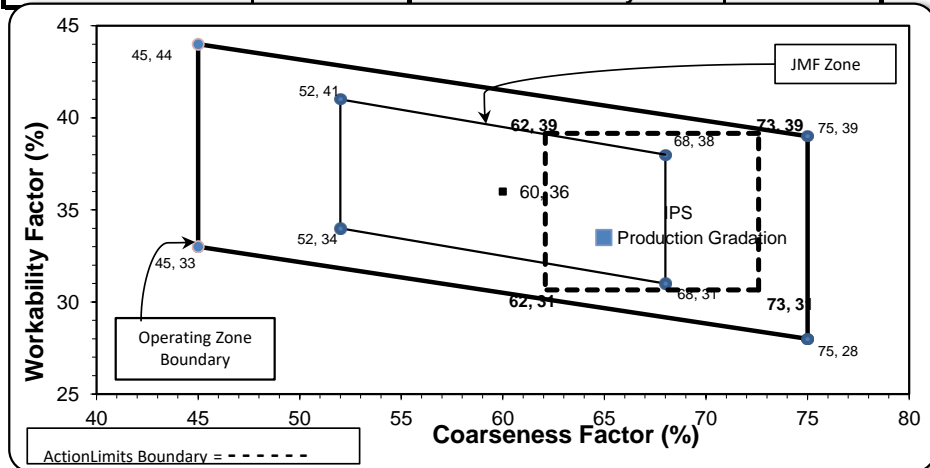
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	64.7	100.0	100.0	84.5	15.5	15.5
3/4"	30.1	100.0	100.0	69.3	15.2	30.7
1/2"	15.5	94.8	100.0	62.0	7.3	38.0
3/8"	9.3	80.8	100.0	56.8	5.2	43.2
#4	3.3	20.4	98.1	42.8	14.0	57.2
#8	2.4	6.0	81.6	33.5	9.3	66.5
#16	2.1	3.0	63.6	25.9	7.6	74.1
#30	2.0	2.4	44.7	18.5	7.4	81.5
#50	1.8	2.2	22.9	10.0	8.5	90.0
#100	1.7	2.0	6.1	3.4	6.5	96.6
LBW	1.4	2.0	1.3	1.5	2.0	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: **65** **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"	85.5	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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

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%



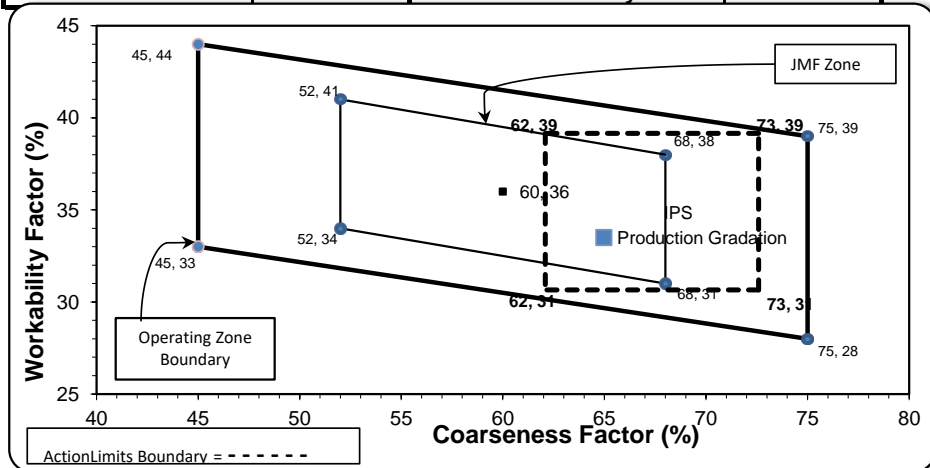
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	64.7	100.0	100.0	84.5	15.5	15.5
3/4"	30.1	100.0	100.0	69.3	15.2	30.7
1/2"	15.5	94.8	100.0	62.0	7.3	38.0
3/8"	9.3	80.8	100.0	56.8	5.2	43.2
#4	3.3	20.4	98.1	42.8	14.0	57.2
#8	2.4	6.0	81.6	33.5	9.3	66.5
#16	2.1	3.0	63.6	25.9	7.6	74.1
#30	2.0	2.4	44.7	18.5	7.4	81.5
#50	1.8	2.2	22.9	10.0	8.5	90.0
#100	1.7	2.0	6.1	3.4	6.5	96.6
LBW	1.4	2.0	1.3	1.5	2.0	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: **65** **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"	85.5	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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Contractor: _____

Dates Test Represents: 8/1/2023 through 8/7/2023

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%



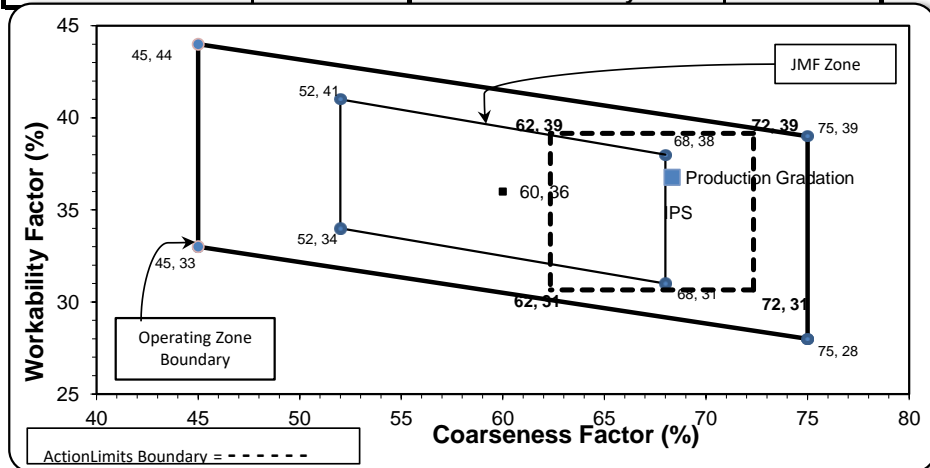
Builders Redi-Mix
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	64.7	100.0	100.0	84.5	15.5	15.5
3/4"	30.1	100.0	100.0	69.3	15.2	30.7
1/2"	15.5	94.8	100.0	62.0	7.3	38.0
3/8"	9.3	80.8	100.0	56.8	5.2	43.2
#4	3.3	20.4	99.9	43.5	13.3	56.5
#8	2.4	6.0	90.1	36.8	6.7	63.2
#16	2.1	3.0	69.4	28.1	8.6	71.9
#30	2.0	2.4	44.5	18.4	9.7	81.6
#50	1.8	2.2	14.3	6.7	11.7	93.3
#100	1.7	2.0	2.7	2.1	4.5	97.9
LBW	1.4	2.0	0.2	1.0	1.1	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:	68	Workability Factor:	37
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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

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Aggregate Optimization Chart

PLANT #: 12

Sample Date: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

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%



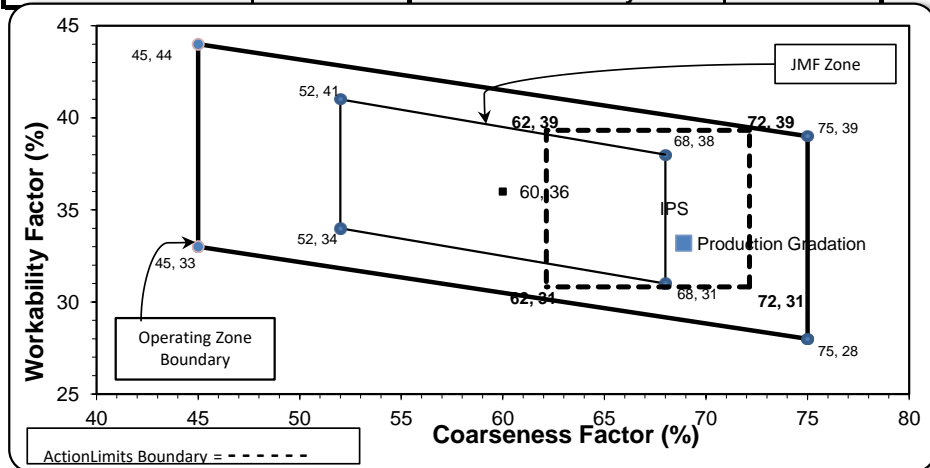
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	98.0	2.0	2.0
1"	46.4	100.0	100.0	82.2	15.8	17.8
3/4"	17.6	99.1	100.0	72.4	9.8	27.6
1/2"	4.3	75.7	100.0	61.5	10.9	38.5
3/8"	2.7	50.5	100.0	54.0	7.5	46.0
#4	2.1	9.4	96.4	41.0	13.0	59.0
#8	2.0	2.7	81.3	33.2	7.8	66.8
#16	1.9	1.7	66.5	27.1	6.1	72.9
#30	1.8	1.5	50.8	20.9	6.2	79.1
#50	1.8	1.4	26.3	11.3	9.6	88.7
#100	1.7	1.2	5.6	3.1	8.2	96.9
LBW	1.3	0.8	0.9	1.0	2.1	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:	33
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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: 7/31/23

Dates Test Represents: 8/1/2023 through 8/7/2023

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	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%



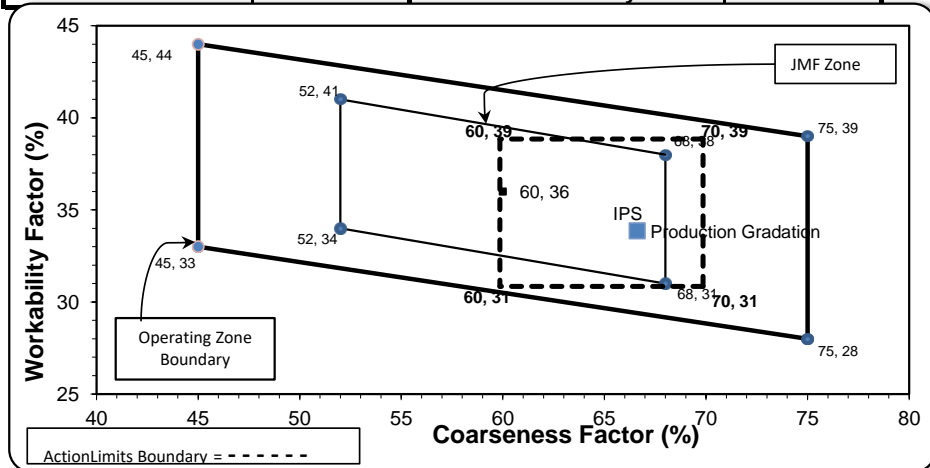
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.9	100.0	100.0	98.2	1.8	1.8
1"	48.5	100.0	100.0	82.1	16.2	17.9
3/4"	18.1	98.2	100.0	71.0	11.1	29.0
1/2"	5.1	81.4	100.0	62.1	8.9	37.9
3/8"	3.5	60.0	100.0	55.9	6.1	44.1
#4	2.7	11.8	94.9	41.1	14.8	58.9
#8	2.5	3.6	82.0	33.9	7.2	66.1
#16	2.4	2.7	68.6	28.4	5.5	71.6
#30	2.2	2.5	51.2	21.4	6.9	78.6
#50	2.1	2.4	22.9	10.3	11.1	89.7
#100	1.9	2.3	3.2	2.5	7.8	97.5
LBW	1.6	2.0	0.3	1.2	1.3	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:	67	Workability Factor:	34
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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: 7/31/23

Concrete Grade: P1M, 3500HP

Dates Test Represents: 8/1/2023 through 8/7/2023

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	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



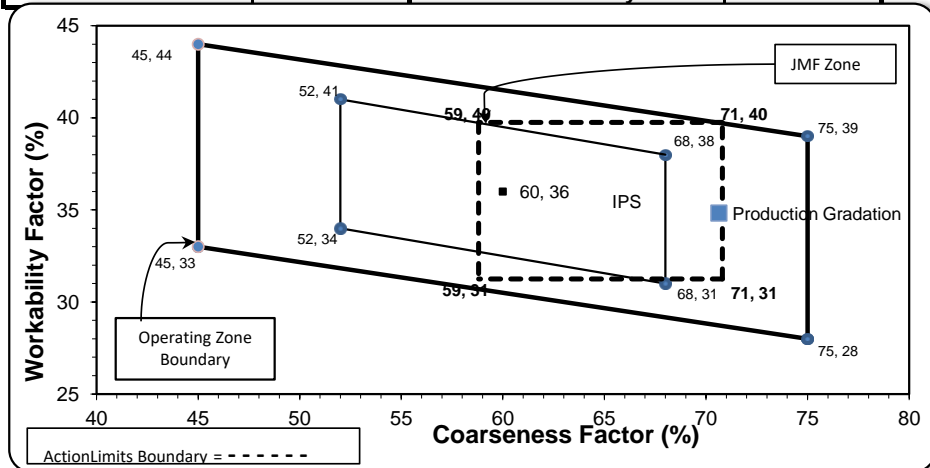
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	98.0	2.0	2.0
1"	46.4	100.0	100.0	82.2	15.8	17.8
3/4"	17.6	99.1	100.0	72.4	9.8	27.6
1/2"	4.3	75.7	100.0	61.5	10.9	38.5
3/8"	2.7	50.5	100.0	54.0	7.5	46.0
#4	2.1	9.4	96.3	40.9	13.0	59.1
#8	2.0	2.7	85.5	34.8	6.1	65.2
#16	1.9	1.7	70.5	28.7	6.2	71.3
#30	1.8	1.5	50.3	20.7	8.0	79.3
#50	1.8	1.4	23.9	10.3	10.3	89.7
#100	1.7	1.2	7.0	3.6	6.7	96.4
LBW	1.3	0.8	0.7	0.9	2.7	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: 71 **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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

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	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



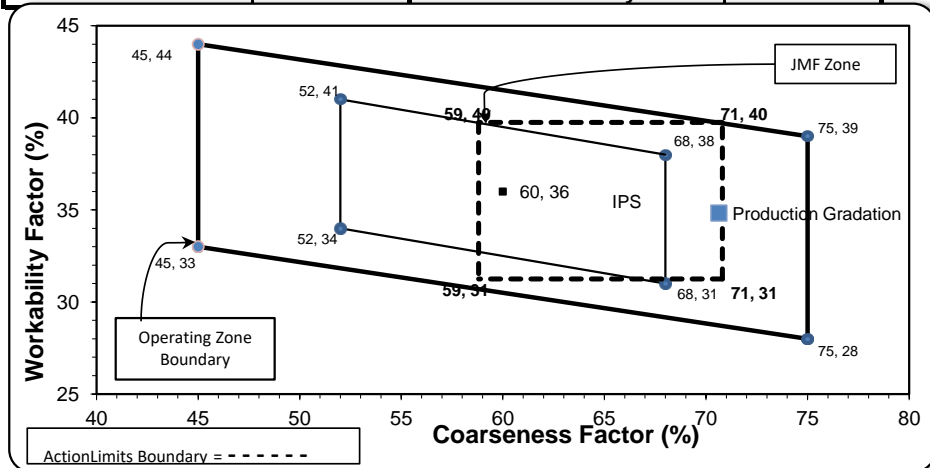
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	98.0	2.0	2.0
1"	46.4	100.0	100.0	82.2	15.8	17.8
3/4"	17.6	99.1	100.0	72.4	9.8	27.6
1/2"	4.3	75.7	100.0	61.5	10.9	38.5
3/8"	2.7	50.5	100.0	54.0	7.5	46.0
#4	2.1	9.4	96.3	40.9	13.0	59.1
#8	2.0	2.7	85.5	34.8	6.1	65.2
#16	1.9	1.7	70.5	28.7	6.2	71.3
#30	1.8	1.5	50.3	20.7	8.0	79.3
#50	1.8	1.4	23.9	10.3	10.3	89.7
#100	1.7	1.2	7.0	3.6	6.7	96.4
LBW	1.3	0.8	0.7	0.9	2.7	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: **71** **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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Contractor: _____

Dates Test Represents: 8/1/2023 through 8/7/2023

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%



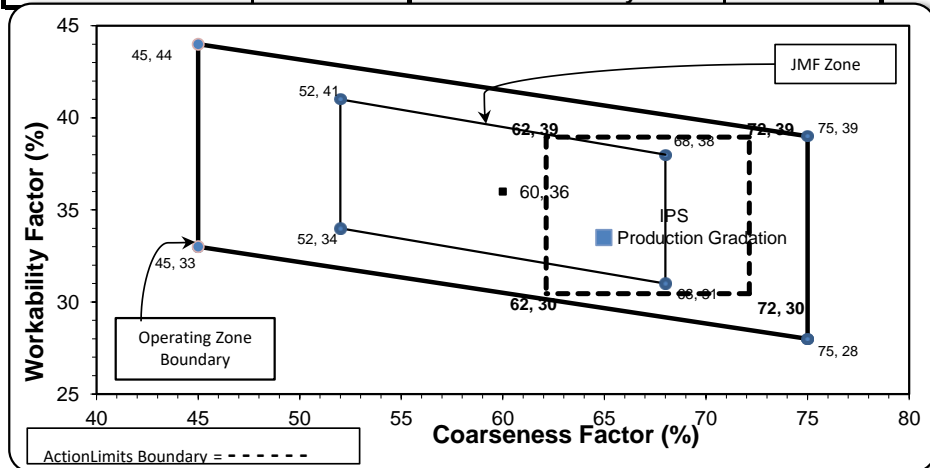
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 Suite 500
 Farmington Hills, MI 48336

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"	64.7	100.0	100.0	84.5	15.5	15.5
3/4"	30.1	100.0	100.0	69.3	15.2	30.7
1/2"	15.5	94.8	100.0	62.0	7.3	38.0
3/8"	9.3	80.8	100.0	56.8	5.2	43.2
#4	3.3	20.4	98.1	42.8	14.0	57.2
#8	2.4	6.0	81.6	33.5	9.3	66.5
#16	2.1	3.0	63.6	25.9	7.6	74.1
#30	2.0	2.4	44.7	18.5	7.4	81.5
#50	1.8	2.2	22.9	10.0	8.5	90.0
#100	1.7	2.0	6.1	3.4	6.5	96.6
LBW	1.4	2.0	1.3	1.5	2.0	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:	65	Workability Factor:	33
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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"	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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

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

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



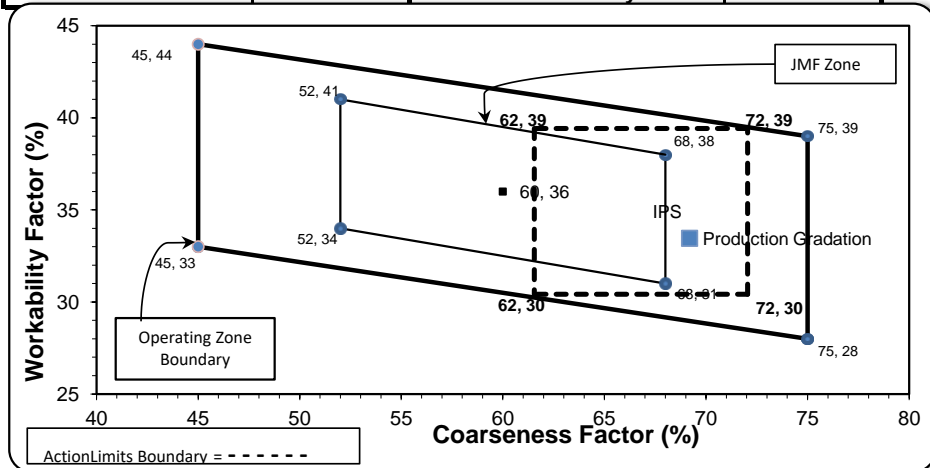
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	98.0	2.0	2.0
1"	46.4	100.0	100.0	82.2	15.8	17.8
3/4"	17.6	99.1	100.0	72.4	9.8	27.6
1/2"	4.3	75.7	100.0	61.5	10.9	38.5
3/8"	2.7	50.5	100.0	54.0	7.5	46.0
#4	2.1	9.4	94.9	40.4	13.6	59.6
#8	2.0	2.7	82.0	33.5	6.9	66.5
#16	1.9	1.7	68.6	27.9	5.5	72.1
#30	1.8	1.5	51.2	21.0	6.9	79.0
#50	1.8	1.4	22.9	9.9	11.1	90.1
#100	1.7	1.2	3.2	2.1	7.8	97.9
LBW	1.3	0.8	0.3	0.8	1.4	99.2

*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:** **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"	72.1	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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

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%



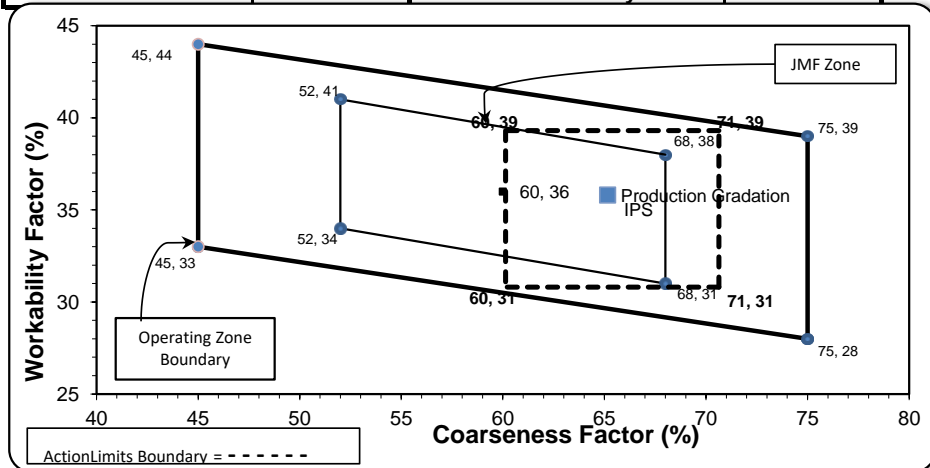
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.4	0.6	0.6
1"	36.5	100.0	100.0	78.9	20.5	21.1
3/4"	10.8	98.5	100.0	70.0	8.9	30.0
1/2"	3.4	83.2	100.0	63.5	6.4	36.5
3/8"	2.6	63.7	100.0	58.2	5.3	41.8
#4	2.3	17.3	97.7	45.1	13.1	54.9
#8	2.3	4.5	83.2	35.8	9.2	64.2
#16	2.2	2.7	67.2	28.8	7.0	71.2
#30	2.1	2.3	49.3	21.4	7.4	78.6
#50	2.0	2.1	22.5	10.4	11.0	89.6
#100	1.9	1.9	6.3	3.7	6.7	96.3
LBW	1.5	1.7	1.3	1.5	2.2	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: **65** **Workability Factor:** **36**



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: 7/31/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 8/1/2023 through 8/7/2023

Contractor: _____

MDOT No.: _____



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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

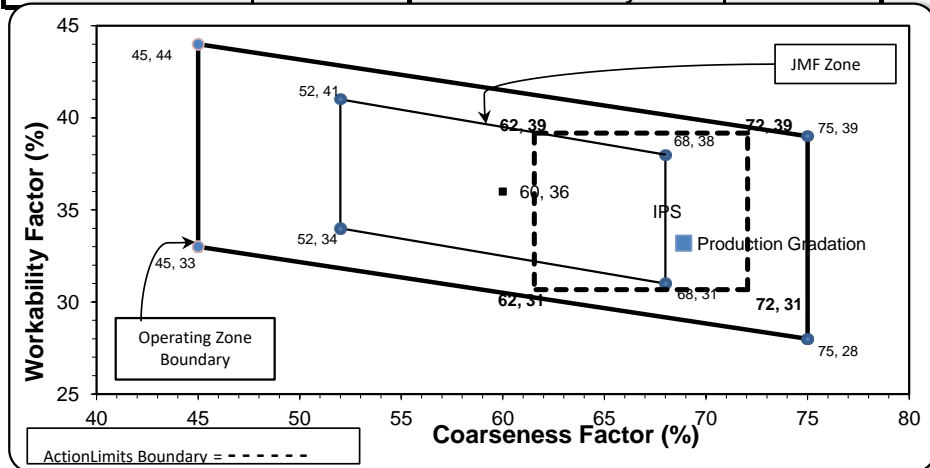
<----- Verify this number is 100%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.0	100.0	100.0	98.0	2.0	2.0
1"	46.4	100.0	100.0	82.2	15.8	17.8
3/4"	17.6	99.1	100.0	72.4	9.8	27.6
1/2"	4.3	75.7	100.0	61.5	10.9	38.5
3/8"	2.7	50.5	100.0	54.0	7.5	46.0
#4	2.1	9.4	96.4	41.0	13.0	59.0
#8	2.0	2.7	81.3	33.2	7.8	66.8
#16	1.9	1.7	66.5	27.1	6.1	72.9
#30	1.8	1.5	50.8	20.9	6.2	79.1
#50	1.8	1.4	26.3	11.3	9.6	88.7
#100	1.7	1.2	5.6	3.1	8.2	96.9
LBW	1.3	0.8	0.9	1.0	2.1	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:	33
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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: