

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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	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"	99.2	100.0	100.0	99.8	0.2	0.2
1"	42.0	100.0	100.0	82.6	17.1	17.4
3/4"	18.3	99.0	100.0	75.2	7.4	24.8
1/2"	6.0	81.2	100.0	66.0	9.2	34.0
3/8"	1.7	59.1	100.0	57.9	8.1	42.1
#4	1.4	16.6	98.2	43.9	13.9	56.1
#8	1.2	5.9	82.4	34.4	9.5	65.6
#16	1.0	3.2	67.1	27.5	6.9	72.5
#30	0.9	2.9	51.9	21.5	6.1	78.5
#50	0.9	2.6	27.2	11.7	9.7	88.3
#100	0.8	2.4	4.7	2.8	8.9	97.2
LBW	0.7	1.8	0.7	1.0	1.8	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

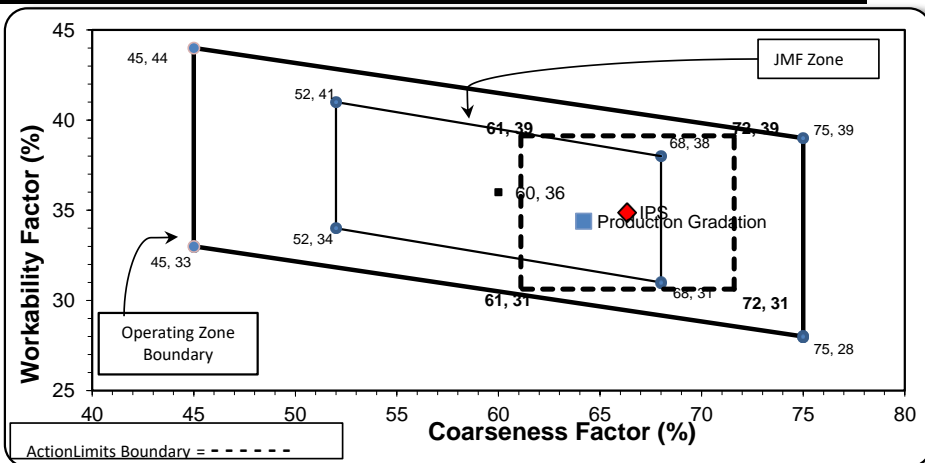
Coarseness Factor:	64	Workability Factor:	34
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Initial Production Sample (IPS)

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: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1420	8.46	2.69	45.5
IA	58-003	Stoneco	500	2.98	2.69	16.0
2NS	63-114	Highland	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

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



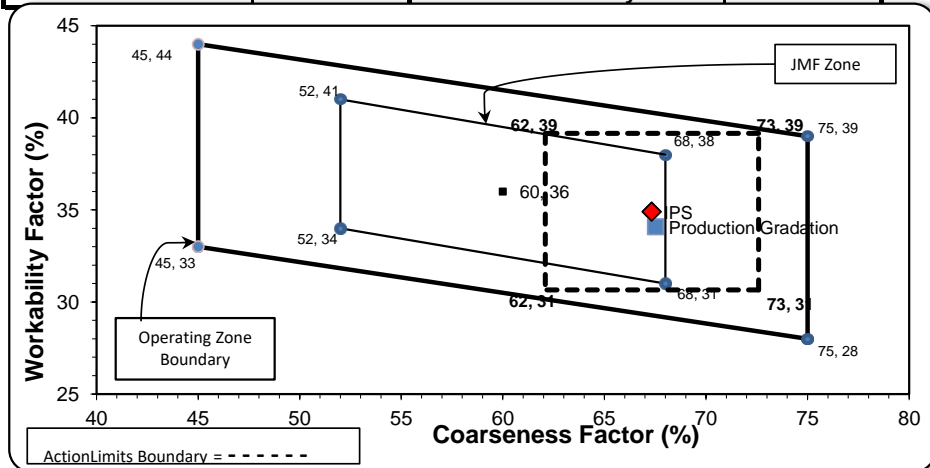
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 Suite 500
 Farmington Hills, MI 48336

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"	63.7	100.0	100.0	83.5	16.5	16.5
3/4"	47.7	100.0	100.0	76.2	7.3	23.8
1/2"	17.4	94.8	100.0	61.6	14.6	38.4
3/8"	8.2	83.0	100.0	55.5	6.1	44.5
#4	2.6	25.4	99.1	43.4	12.1	56.6
#8	2.0	6.1	83.7	34.1	9.3	65.9
#16	1.8	2.3	65.7	26.5	7.6	73.5
#30	1.6	1.6	46.5	18.9	7.6	81.1
#50	1.5	1.4	18.2	7.9	11.0	92.1
#100	1.4	1.2	3.9	2.3	5.6	97.7
LBW	1.3	1.0	0.4	0.9	1.4	99.1

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	68	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"	85.5	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-12**

Sample Date: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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	900	5.50	2.62	29.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



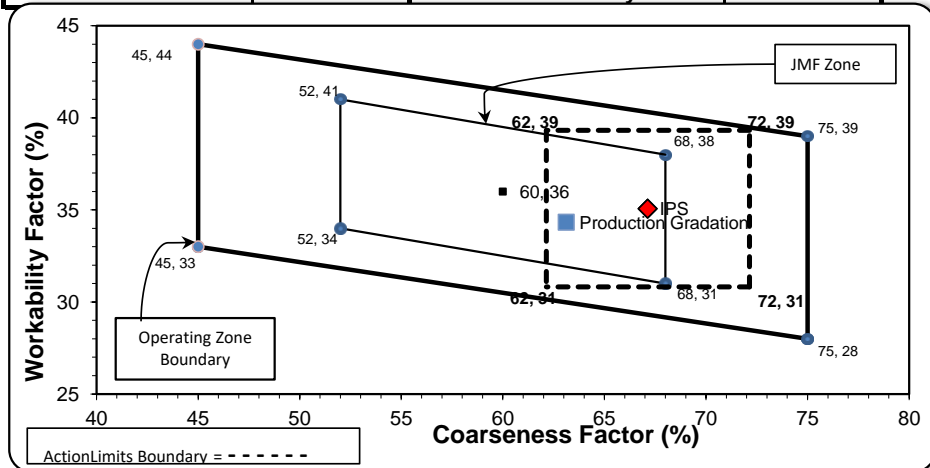
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	99.2	100.0	100.0	99.8	0.2	0.2
1"	42.0	100.0	100.0	82.6	17.1	17.4
3/4"	18.3	99.0	100.0	75.2	7.4	24.8
1/2"	6.0	81.2	100.0	66.3	8.9	33.7
3/8"	1.7	59.1	100.0	58.6	7.8	41.4
#4	1.4	16.6	97.7	45.1	13.5	54.9
#8	1.2	5.9	79.2	34.3	10.7	65.7
#16	1.0	3.2	61.7	26.4	8.0	73.6
#30	0.9	2.9	45.3	19.6	6.8	80.4
#50	0.9	2.6	20.0	9.2	10.4	90.8
#100	0.8	2.4	3.5	2.4	6.8	97.6
LBW	0.7	1.8	0.7	1.0	1.3	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:	63	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 #: **P-20**

Sample Date: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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

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



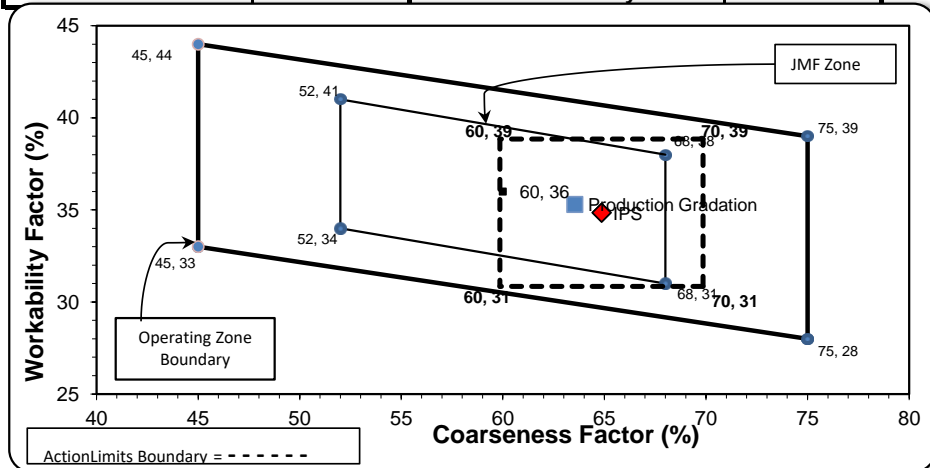
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.0	100.0	100.0	99.1	0.9	0.9
1"	41.8	100.0	100.0	82.0	17.1	18.0
3/4"	11.7	98.9	100.0	72.3	9.6	27.7
1/2"	3.4	82.5	100.0	64.9	7.5	35.1
3/8"	2.0	64.0	100.0	58.9	6.0	41.1
#4	1.5	17.2	97.5	43.7	15.2	56.3
#8	1.1	5.0	85.6	35.3	8.4	64.7
#16	1.0	3.0	70.8	28.9	6.4	71.1
#30	1.0	2.7	48.6	20.1	8.8	79.9
#50	0.9	2.5	17.4	7.8	12.3	92.2
#100	0.9	2.4	2.1	1.8	6.0	98.2
LBW	0.8	2.2	0.4	1.1	0.8	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:	64	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 #: **P-32**

Sample Date: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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%



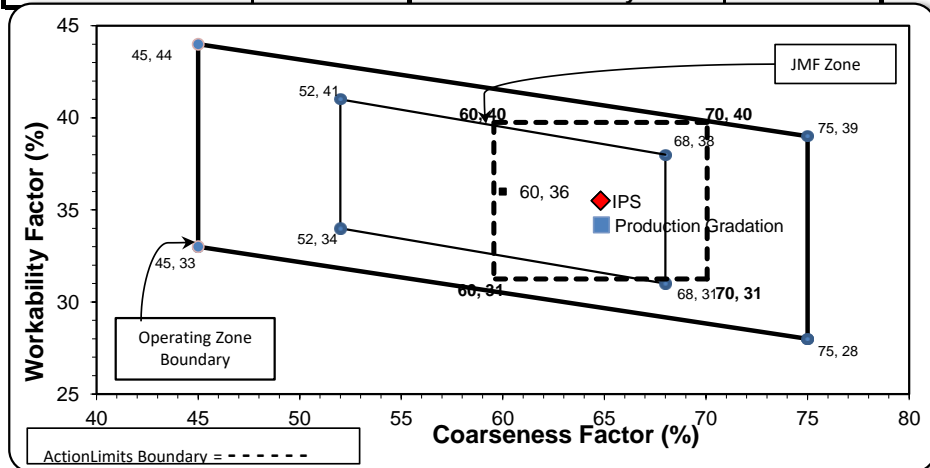
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	99.2	100.0	100.0	99.8	0.2	0.2
1"	42.0	100.0	100.0	82.1	17.7	17.9
3/4"	18.3	99.0	100.0	74.4	7.6	25.6
1/2"	6.0	81.2	100.0	65.3	9.1	34.7
3/8"	1.7	59.1	100.0	57.3	8.0	42.7
#4	1.4	16.6	95.0	42.5	14.8	57.5
#8	1.2	5.9	82.0	34.2	8.3	65.8
#16	1.0	3.2	64.5	26.5	7.7	73.5
#30	0.9	2.9	44.6	18.6	7.9	81.4
#50	0.9	2.6	20.2	9.0	9.6	91.0
#100	0.8	2.4	9.4	4.6	4.3	95.4
LBW	0.7	1.8	1.4	1.3	3.3	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)

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-36**

Sample Date: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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%



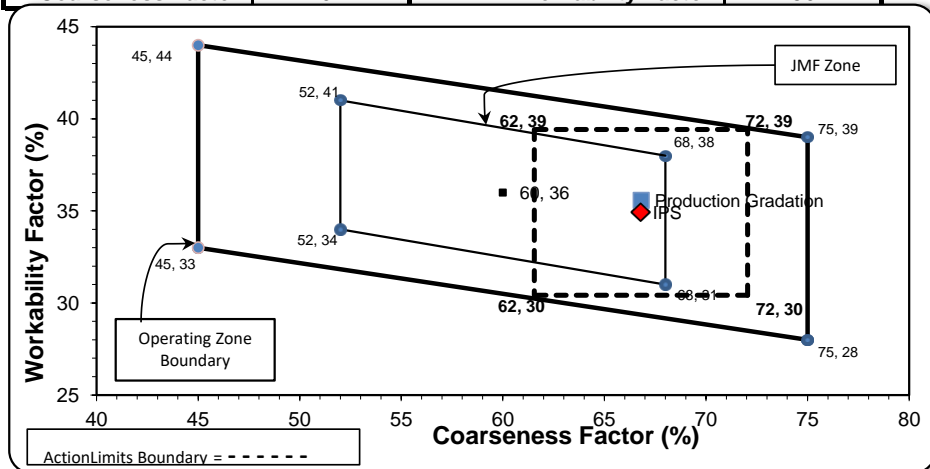
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	99.2	100.0	100.0	99.7	0.3	0.3
1"	42.0	100.0	100.0	81.7	18.1	18.3
3/4"	18.3	99.0	100.0	73.9	7.8	26.1
1/2"	6.0	81.2	100.0	64.8	9.1	35.2
3/8"	1.7	59.1	100.0	57.0	7.8	43.0
#4	1.4	16.6	97.5	43.4	13.5	56.6
#8	1.2	5.9	85.6	35.6	7.9	64.4
#16	1.0	3.2	70.8	28.9	6.6	71.1
#30	0.9	2.9	48.6	20.1	8.8	79.9
#50	0.9	2.6	17.4	7.8	12.3	92.2
#100	0.8	2.4	2.1	1.8	6.1	98.2
LBW	0.7	1.8	0.4	0.9	0.9	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:	67	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"	85.0	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: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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	44-051	Krake Willis Rd	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



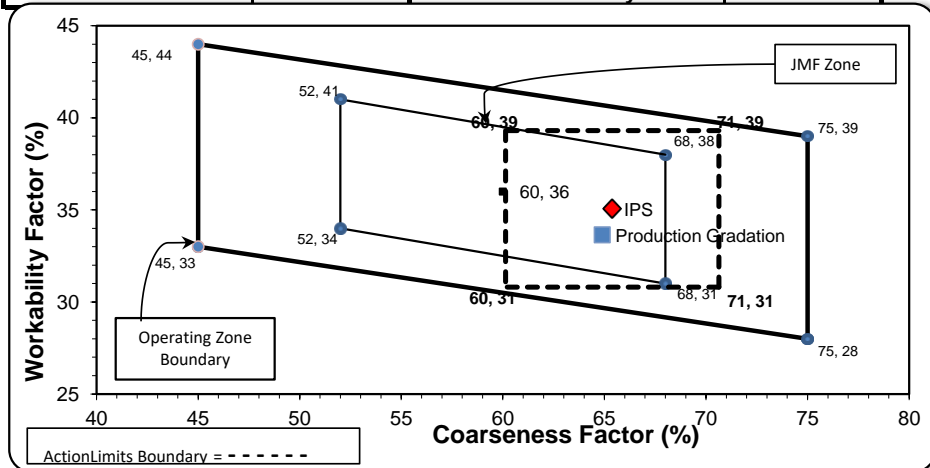
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	99.2	100.0	100.0	99.7	0.3	0.3
1"	42.0	100.0	100.0	81.7	18.1	18.3
3/4"	18.3	99.0	100.0	73.9	7.8	26.1
1/2"	6.0	81.2	100.0	64.8	9.1	35.2
3/8"	1.7	59.1	100.0	57.0	7.8	43.0
#4	1.4	16.6	95.8	42.8	14.2	57.2
#8	1.2	5.9	80.7	33.7	9.1	66.3
#16	1.0	3.2	64.9	26.6	7.0	73.4
#30	0.9	2.9	50.0	20.7	5.9	79.3
#50	0.9	2.6	24.9	10.8	9.9	89.2
#100	0.8	2.4	6.7	3.6	7.2	96.4
LBW	0.7	1.8	0.8	1.1	2.5	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: **65** **Workability Factor:** **34**



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: 10/12/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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	900	5.50	2.62	29.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



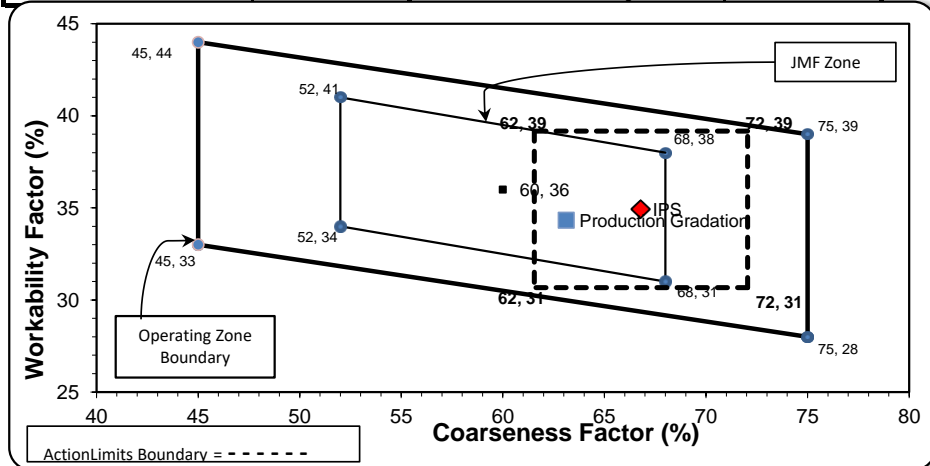
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	99.2	100.0	100.0	99.8	0.2	0.2
1"	42.0	100.0	100.0	82.6	17.1	17.4
3/4"	18.3	99.0	100.0	75.2	7.4	24.8
1/2"	6.0	81.2	100.0	66.3	8.9	33.7
3/8"	1.7	59.1	100.0	58.6	7.8	41.4
#4	1.4	16.6	97.7	45.1	13.5	54.9
#8	1.2	5.9	79.2	34.3	10.7	65.7
#16	1.0	3.2	61.7	26.4	8.0	73.6
#30	0.9	2.9	45.3	19.6	6.8	80.4
#50	0.9	2.6	20.0	9.2	10.4	90.8
#100	0.8	2.4	3.5	2.4	6.8	97.6
LBW	0.7	1.8	0.7	1.0	1.3	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: **63** **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"	72.3	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: