

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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"	95.0	100.0	100.0	98.5	1.5	1.5
1"	28.0	100.0	100.0	78.4	20.1	21.6
3/4"	9.5	99.0	100.0	72.6	5.9	27.4
1/2"	5.9	79.8	100.0	65.5	7.0	34.5
3/8"	4.5	58.2	100.0	58.4	7.1	41.6
#4	2.7	16.6	98.1	44.3	14.2	55.7
#8	2.1	6.0	81.4	34.3	10.0	65.7
#16	2.0	3.6	64.9	27.1	7.2	72.9
#30	1.9	3.1	49.0	20.7	6.4	79.3
#50	1.8	2.9	25.1	11.2	9.4	88.8
#100	1.7	2.7	5.3	3.4	7.8	96.6
LBW	1.4	2.2	0.6	1.3	2.1	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.

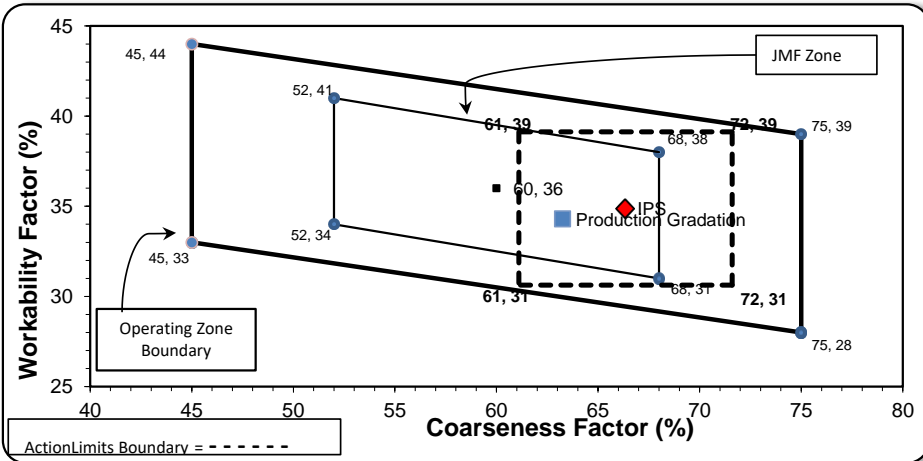
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	63	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: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



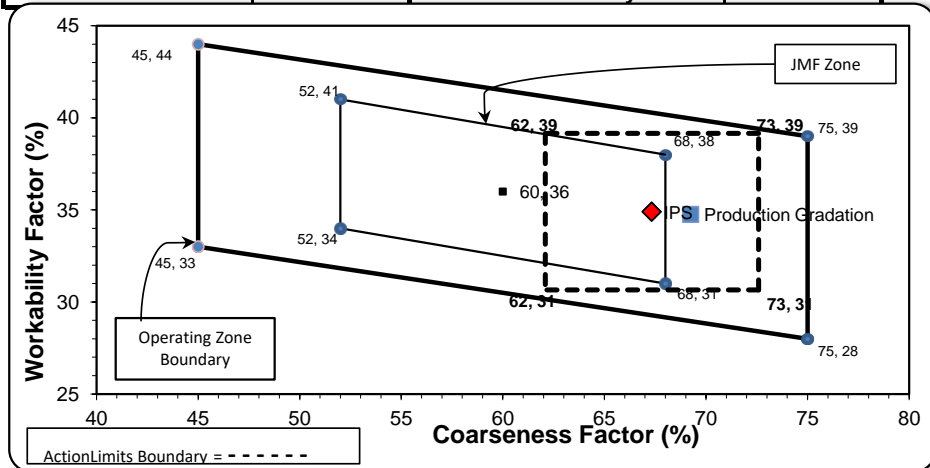
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 Suite 500
 Farmington Hills, MI 48336

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"	65.7	100.0	100.0	84.4	15.6	15.6
3/4"	35.9	100.0	100.0	70.8	13.6	29.2
1/2"	14.4	90.0	100.0	59.4	11.4	40.6
3/8"	8.2	78.8	100.0	54.8	4.6	45.2
#4	2.2	25.7	99.2	43.3	11.5	56.7
#8	1.6	6.2	85.9	34.8	8.5	65.2
#16	1.4	2.4	69.6	27.8	7.0	72.2
#30	1.2	1.7	48.8	19.6	8.2	80.4
#50	1.2	1.5	17.6	7.6	12.0	92.4
#100	1.1	1.4	4.2	2.3	5.2	97.7
LBW	1.0	1.1	0.3	0.7	1.6	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:	69	Workability Factor:	35
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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: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



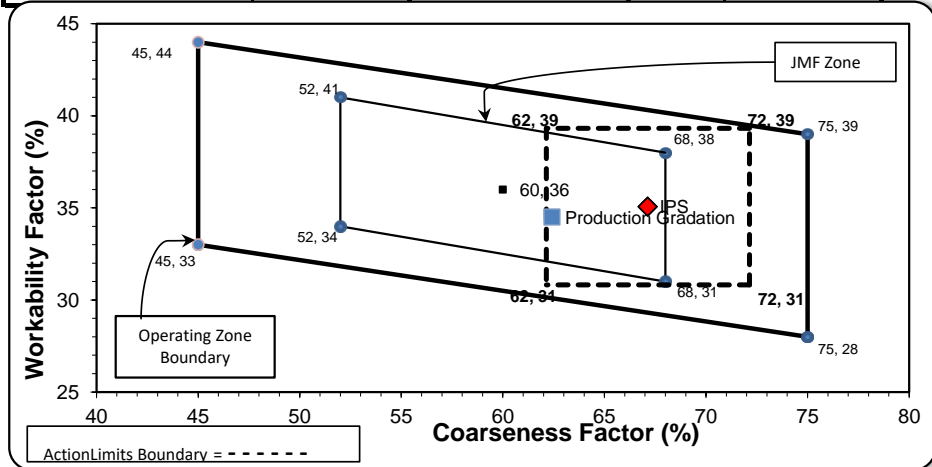
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	98.5	1.5	1.5
1"	28.0	100.0	100.0	78.4	20.1	21.6
3/4"	9.5	99.0	100.0	72.6	5.8	27.4
1/2"	5.9	79.8	100.0	65.9	6.7	34.1
3/8"	4.5	58.2	100.0	59.1	6.8	40.9
#4	2.7	16.6	97.8	45.5	13.6	54.5
#8	2.1	6.0	78.9	34.5	11.0	65.5
#16	2.0	3.6	61.2	26.6	7.9	73.4
#30	1.9	3.1	44.9	19.8	6.8	80.2
#50	1.8	2.9	19.8	9.5	10.3	90.5
#100	1.7	2.7	3.1	2.6	6.9	97.4
LBW	1.4	2.2	0.3	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: **62** **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"	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: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



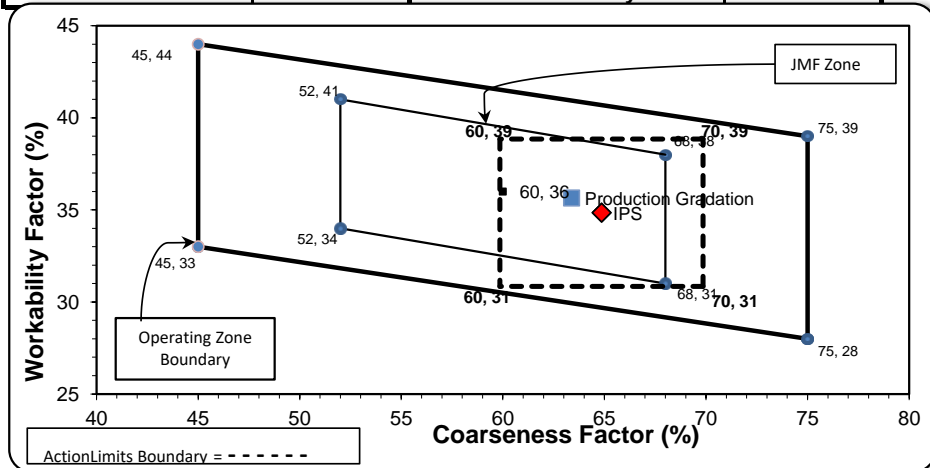
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.1	100.0	100.0	99.1	0.9	0.9
1"	38.7	100.0	100.0	81.0	18.1	19.0
3/4"	10.4	98.6	100.0	71.9	9.2	28.1
1/2"	2.5	86.0	100.0	65.6	6.2	34.4
3/8"	1.9	65.2	100.0	59.2	6.4	40.8
#4	1.6	13.7	98.0	42.9	16.3	57.1
#8	1.4	4.7	86.5	35.7	7.3	64.3
#16	1.3	3.1	71.5	29.3	6.4	70.7
#30	1.3	2.7	48.7	20.2	9.0	79.8
#50	1.2	2.5	17.5	8.0	12.3	92.0
#100	1.2	2.3	2.1	1.9	6.1	98.1
LBW	1.0	2.1	0.5	1.1	0.7	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:	63	Workability Factor:	36
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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: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



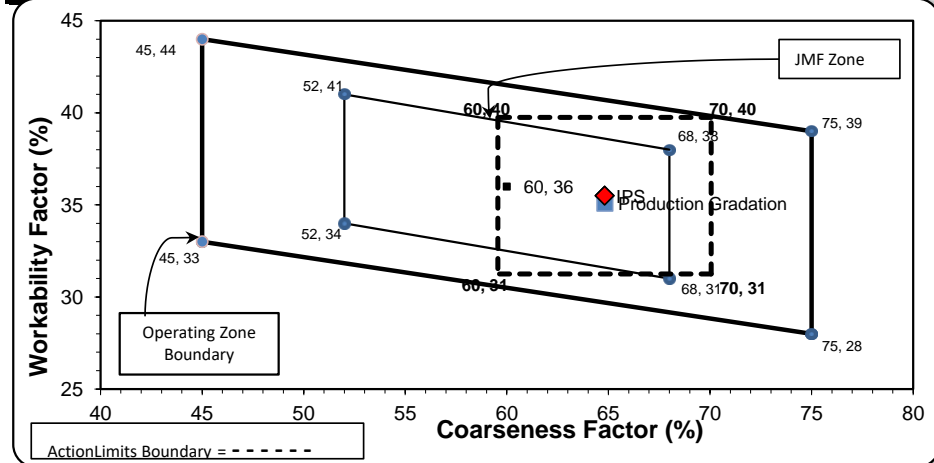
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	98.5	1.5	1.5
1"	28.0	100.0	100.0	77.7	20.7	22.3
3/4"	9.5	99.0	100.0	71.7	6.0	28.3
1/2"	5.9	79.8	100.0	64.8	6.9	35.2
3/8"	4.5	58.2	100.0	57.9	6.9	42.1
#4	2.7	16.6	96.7	43.6	14.3	56.4
#8	2.1	6.0	83.5	35.1	8.5	64.9
#16	2.0	3.6	67.4	28.0	7.0	72.0
#30	1.9	3.1	47.1	19.9	8.1	80.1
#50	1.8	2.9	22.6	10.3	9.7	89.7
#100	1.7	2.7	6.2	3.8	6.5	96.2
LBW	1.4	2.2	1.0	1.5	2.3	98.5

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	65	Workability Factor:	35
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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-36**

Sample Date: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



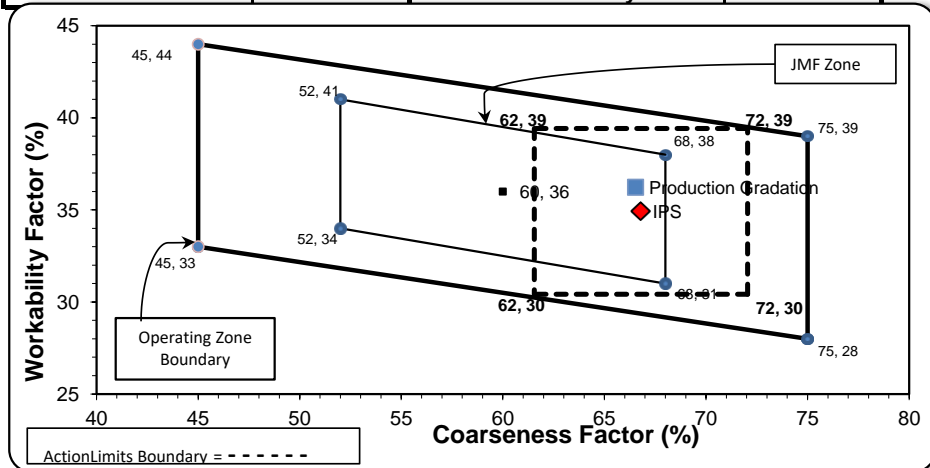
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	98.4	1.6	1.6
1"	28.0	100.0	100.0	77.3	21.2	22.7
3/4"	9.5	99.0	100.0	71.1	6.1	28.9
1/2"	5.9	79.8	100.0	64.3	6.8	35.7
3/8"	4.5	58.2	100.0	57.6	6.8	42.4
#4	2.7	16.6	98.0	44.0	13.5	56.0
#8	2.1	6.0	86.5	36.2	7.8	63.8
#16	2.0	3.6	71.5	29.6	6.6	70.4
#30	1.9	3.1	48.7	20.5	9.1	79.5
#50	1.8	2.9	17.5	8.3	12.3	91.7
#100	1.7	2.7	2.1	2.1	6.1	97.9
LBW	1.4	2.2	0.5	1.3	0.9	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:** **36**



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: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



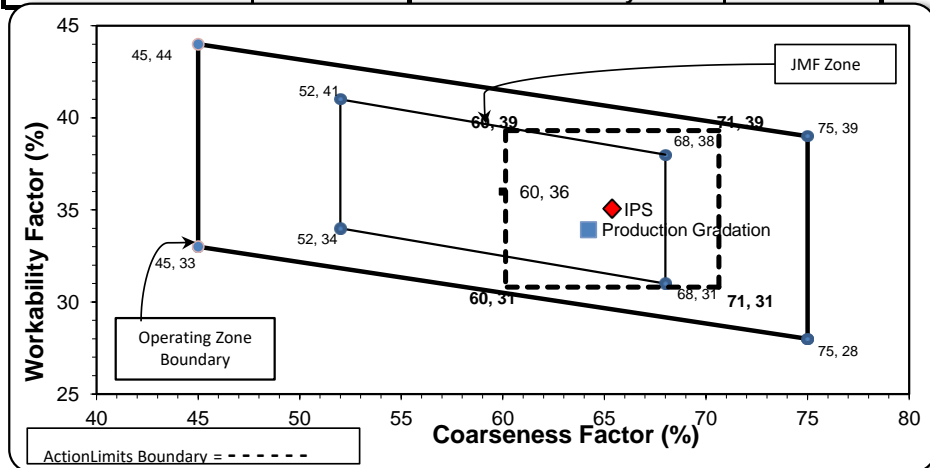
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	98.4	1.6	1.6
1"	28.0	100.0	100.0	77.3	21.2	22.7
3/4"	9.5	99.0	100.0	71.1	6.1	28.9
1/2"	5.9	79.8	100.0	64.3	6.8	35.7
3/8"	4.5	58.2	100.0	57.6	6.8	42.4
#4	2.7	16.6	95.6	43.1	14.5	56.9
#8	2.1	6.0	80.6	33.9	9.2	66.1
#16	2.0	3.6	64.8	27.0	6.9	73.0
#30	1.9	3.1	50.2	21.1	5.9	78.9
#50	1.8	2.9	26.3	11.7	9.4	88.3
#100	1.7	2.7	7.8	4.4	7.3	95.6
LBW	1.4	2.2	0.9	1.4	2.9	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: **64** **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: 10/5/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/6/2020 through 10/12/2020

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%



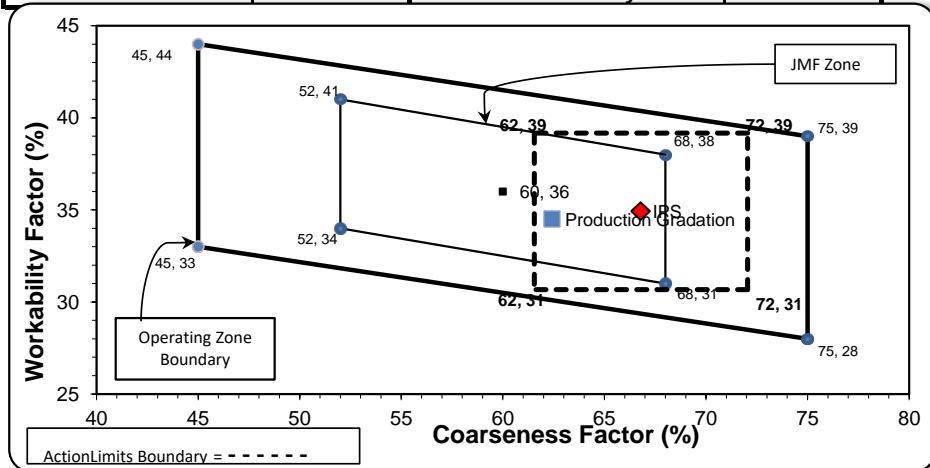
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	98.5	1.5	1.5
1"	28.0	100.0	100.0	78.4	20.1	21.6
3/4"	9.5	99.0	100.0	72.6	5.8	27.4
1/2"	5.9	79.8	100.0	65.9	6.7	34.1
3/8"	4.5	58.2	100.0	59.1	6.8	40.9
#4	2.7	16.6	97.8	45.5	13.6	54.5
#8	2.1	6.0	78.9	34.5	11.0	65.5
#16	2.0	3.6	61.2	26.6	7.9	73.4
#30	1.9	3.1	44.9	19.8	6.8	80.2
#50	1.8	2.9	19.8	9.5	10.3	90.5
#100	1.7	2.7	3.1	2.6	6.9	97.4
LBW	1.4	2.2	0.3	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:	62	Workability Factor:	35
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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: