

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 4/5/21 Concrete Grade: **P1M**
 Dates Test Represents: 4/6/2021 through 4/12/2021

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"	96.2	100.0	100.0	98.7	1.3	1.3
1"	52.8	100.0	100.0	83.5	15.1	16.5
3/4"	14.7	98.0	100.0	69.7	13.8	30.3
1/2"	4.6	77.4	100.0	60.9	8.9	39.1
3/8"	3.1	53.8	100.0	54.2	6.7	45.8
#4	2.1	9.3	98.3	41.6	12.6	58.4
#8	1.9	3.2	83.6	34.2	7.4	65.8
#16	1.8	2.6	68.5	28.1	6.1	71.9
#30	1.8	2.3	50.8	21.1	7.0	78.9
#50	1.7	2.2	23.8	10.5	10.6	89.5
#100	1.6	2.1	3.6	2.5	8.0	97.5
LBW	1.4	1.9	0.4	1.1	1.4	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.

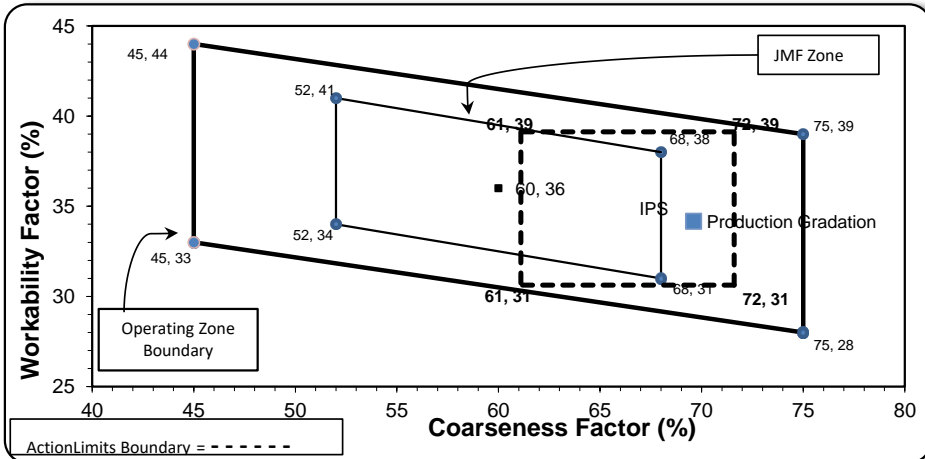
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **70** **Workability Factor:** **34**

Initial Production Sample (IPS)

Coarseness Factor: **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: 4/5/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 4/6/2021 through 4/12/2021

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%



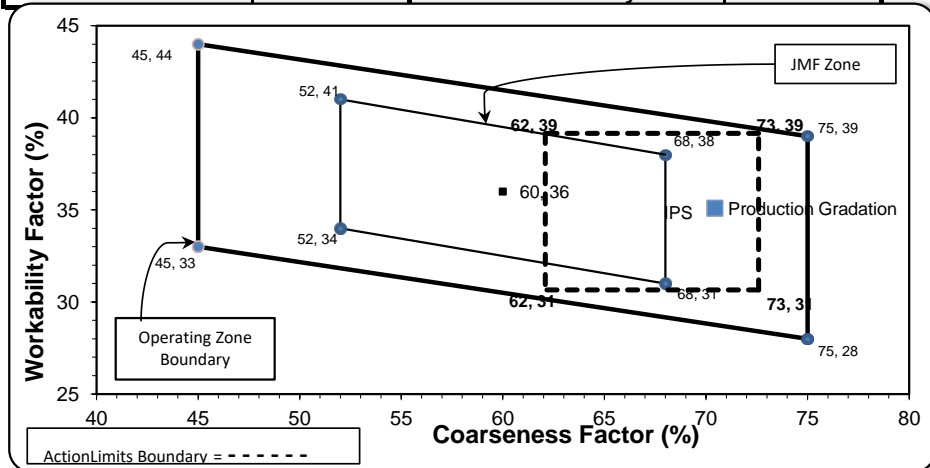
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 Suite 500
 Farmington Hills, MI 48336

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"	65.8	100.0	100.0	84.4	15.6	15.6
3/4"	36.2	100.0	100.0	71.0	13.5	29.0
1/2"	13.3	90.7	100.0	59.1	11.9	41.0
3/8"	7.4	77.7	100.0	54.3	4.8	45.7
#4	3.0	26.9	99.5	43.9	10.3	56.1
#8	2.2	8.0	85.3	35.1	8.9	64.9
#16	1.7	4.6	67.4	27.4	7.7	72.6
#30	1.6	3.1	48.5	19.9	7.6	80.1
#50	1.4	2.8	20.0	8.8	11.1	91.2
#100	1.3	2.5	3.9	2.5	6.3	97.5
LBW	1.2	2.2	1.0	1.3	1.2	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:	70	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

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Aggregate Optimization Chart

PLANT #: **P-12**

Sample Date: 4/5/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 4/6/2021 through 4/12/2021

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%



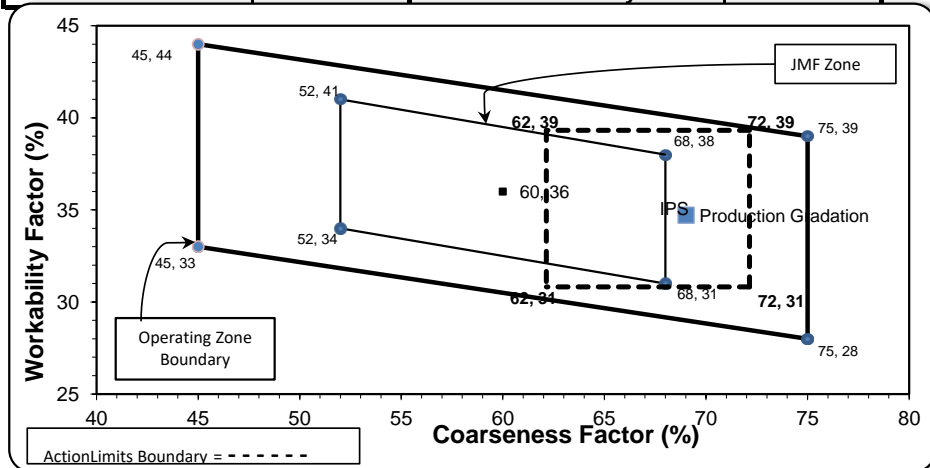
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.7	1.3	1.3
1"	52.8	100.0	100.0	83.5	15.1	16.5
3/4"	14.7	98.0	100.0	69.8	13.8	30.2
1/2"	4.6	77.4	100.0	61.2	8.6	38.8
3/8"	3.1	53.8	100.0	54.9	6.3	45.1
#4	2.1	9.3	97.5	42.7	12.2	57.3
#8	1.9	3.2	81.7	34.7	8.0	65.3
#16	1.8	2.6	66.8	28.5	6.2	71.5
#30	1.8	2.3	50.9	21.9	6.5	78.1
#50	1.7	2.2	25.3	11.4	10.5	88.6
#100	1.6	2.1	4.6	2.9	8.5	97.1
LBW	1.4	1.9	0.7	1.2	1.7	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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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 #: **P-32**

Sample Date: 4/5/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 4/6/2021 through 4/12/2021

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%



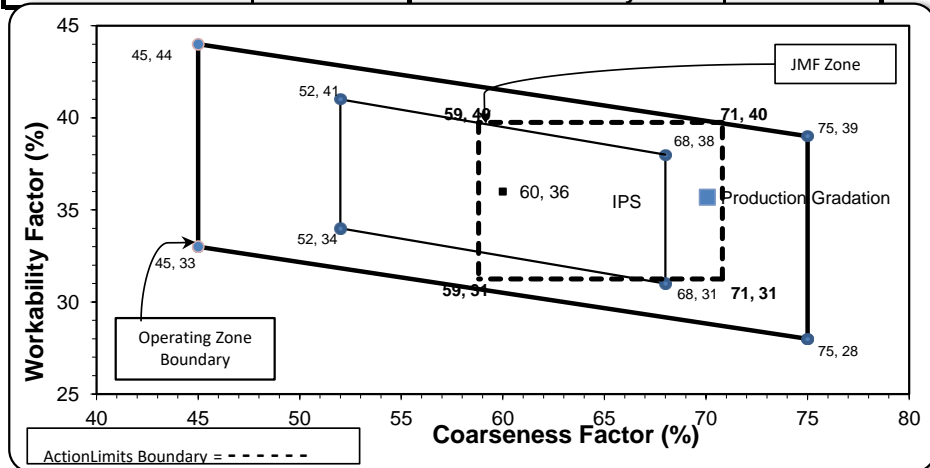
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.7	1.3	1.3
1"	52.8	100.0	100.0	83.5	15.1	16.5
3/4"	14.7	98.0	100.0	69.8	13.8	30.2
1/2"	4.6	77.4	100.0	61.2	8.6	38.8
3/8"	3.1	53.8	100.0	54.9	6.3	45.1
#4	2.1	9.3	96.2	42.2	12.8	57.8
#8	1.9	3.2	84.1	35.7	6.5	64.3
#16	1.8	2.6	68.4	29.1	6.6	70.9
#30	1.8	2.3	48.7	21.0	8.1	79.0
#50	1.7	2.2	21.7	10.0	11.1	90.0
#100	1.6	2.1	5.6	3.4	6.6	96.6
LBW	1.4	1.9	1.3	1.5	1.9	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:** **36**



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:
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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 4/5/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 4/6/2021 through 4/12/2021

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%



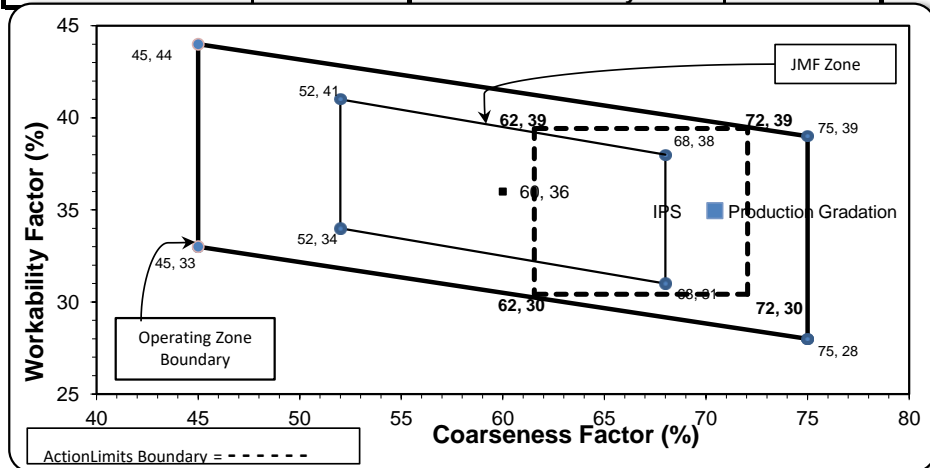
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.7	1.3	1.3
1"	52.8	100.0	100.0	83.5	15.1	16.5
3/4"	14.7	98.0	100.0	69.7	13.8	30.3
1/2"	4.6	77.4	100.0	60.9	8.9	39.1
3/8"	3.1	53.8	100.0	54.2	6.7	45.8
#4	2.1	9.3	97.7	41.3	12.8	58.7
#8	1.9	3.2	85.6	35.0	6.4	65.0
#16	1.8	2.6	71.5	29.3	5.7	70.7
#30	1.8	2.3	50.8	21.1	8.2	78.9
#50	1.7	2.2	19.8	8.9	12.2	91.1
#100	1.6	2.1	2.6	2.1	6.8	97.9
LBW	1.4	1.9	0.5	1.2	0.9	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:	70	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"	72.1	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: 4/5/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 4/6/2021 through 4/12/2021

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

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



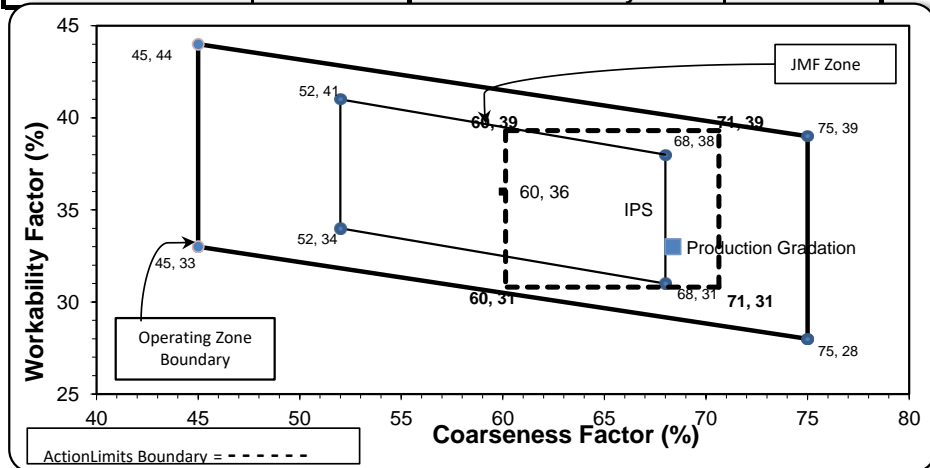
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.7	1.3	1.3
1"	52.8	100.0	100.0	83.5	15.1	16.5
3/4"	14.7	98.0	100.0	69.7	13.8	30.3
1/2"	4.6	77.4	100.0	60.9	8.9	39.1
3/8"	3.1	53.8	100.0	54.2	6.7	45.8
#4	2.1	9.3	95.6	40.5	13.7	59.5
#8	1.9	3.2	80.6	33.0	7.5	67.0
#16	1.8	2.6	68.0	27.9	5.1	72.1
#30	1.8	2.3	53.3	22.1	5.8	77.9
#50	1.7	2.2	27.6	12.0	10.1	88.0
#100	1.6	2.1	8.3	4.3	7.6	95.7
LBW	1.4	1.9	1.2	1.5	2.9	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: **68** **Workability Factor:** **33**



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: 4/5/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 4/6/2021 through 4/12/2021

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%



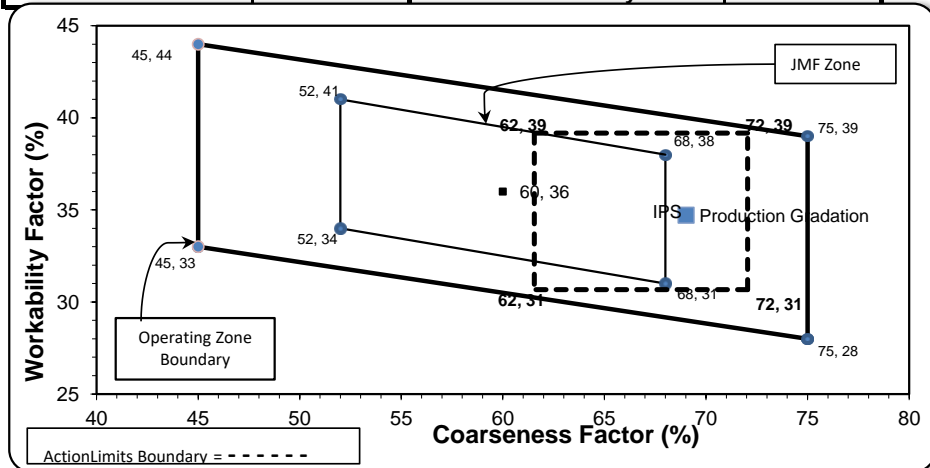
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.7	1.3	1.3
1"	52.8	100.0	100.0	83.5	15.1	16.5
3/4"	14.7	98.0	100.0	69.8	13.8	30.2
1/2"	4.6	77.4	100.0	61.2	8.6	38.8
3/8"	3.1	53.8	100.0	54.9	6.3	45.1
#4	2.1	9.3	97.5	42.7	12.2	57.3
#8	1.9	3.2	81.7	34.7	8.0	65.3
#16	1.8	2.6	66.8	28.5	6.2	71.5
#30	1.8	2.3	50.9	21.9	6.5	78.1
#50	1.7	2.2	25.3	11.4	10.5	88.6
#100	1.6	2.1	4.6	2.9	8.5	97.1
LBW	1.4	1.9	0.7	1.2	1.7	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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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: