

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

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	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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	49.3	100.0	100.0	82.3	17.7	17.7
3/4"	12.2	98.7	100.0	69.1	13.3	30.9
1/2"	3.4	83.2	100.0	62.0	7.1	38.0
3/8"	2.5	62.2	100.0	56.2	5.8	43.8
#4	1.9	12.9	98.6	42.6	13.6	57.4
#8	1.7	3.7	81.8	33.5	9.0	66.5
#16	1.7	2.0	65.4	26.7	6.9	73.3
#30	1.6	1.7	50.3	20.7	6.0	79.3
#50	1.5	1.6	28.1	11.9	8.7	88.1
#100	1.5	1.5	8.7	4.3	7.6	95.7
LBW	1.3	1.4	0.6	1.1	3.3	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.

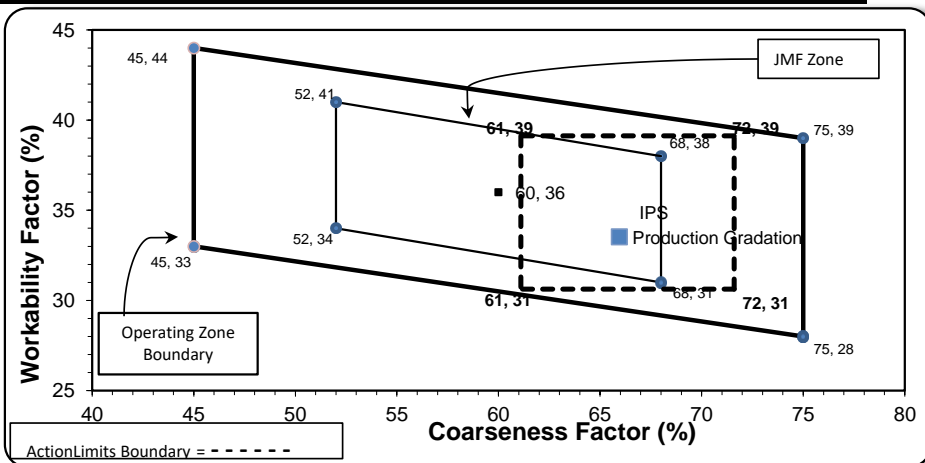
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	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: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1350	8.04	2.69	43.3
IA	58-003	Stoneco	620	3.69	2.69	19.9
2NS	63-114	Highland	1150	6.95	2.65	36.9
Total Wt			3120	18.69		100.0

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



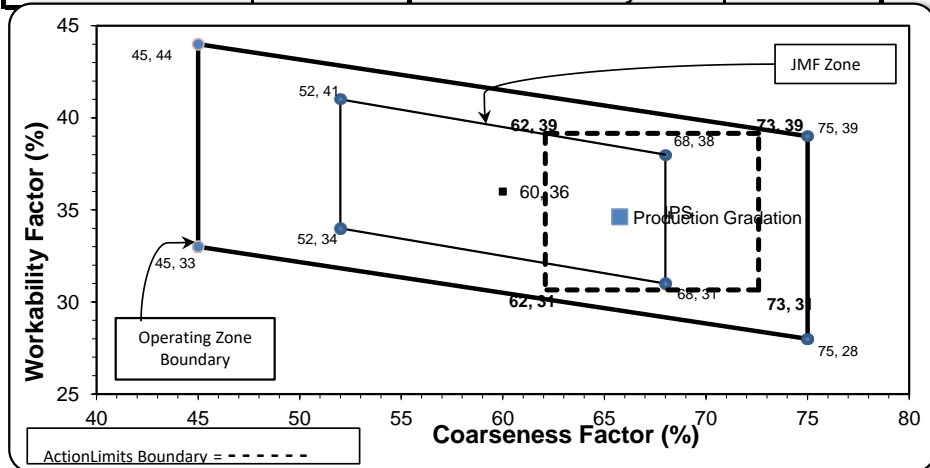
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	65.6	100.0	100.0	85.1	14.9	14.9
3/4"	35.4	100.0	100.0	72.0	13.1	28.0
1/2"	12.1	95.0	100.0	61.0	11.1	39.0
3/8"	7.9	84.2	100.0	57.0	4.0	43.0
#4	2.9	24.9	99.8	43.0	14.0	57.0
#8	2.1	7.9	87.2	34.6	8.4	65.4
#16	1.7	3.8	65.9	25.8	8.8	74.2
#30	1.6	2.8	44.7	17.7	8.1	82.3
#50	1.5	2.6	18.2	7.9	9.9	92.1
#100	1.3	2.5	2.9	2.1	5.7	97.9
LBW	1.2	2.2	0.6	1.2	1.0	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:	66	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: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

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	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



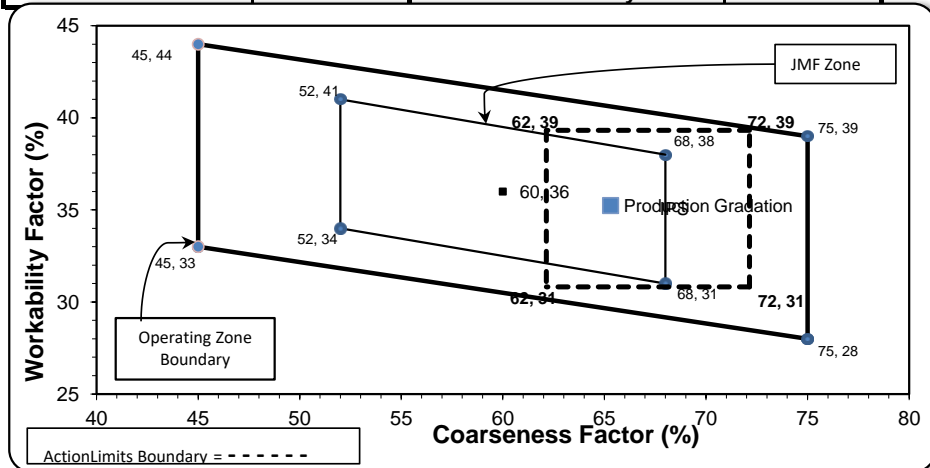
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	42.7	100.0	100.0	81.0	18.0	19.0
3/4"	8.2	98.6	100.0	69.1	11.8	30.9
1/2"	1.8	87.0	100.0	64.0	5.1	36.0
3/8"	1.5	63.3	100.0	57.7	6.3	42.3
#4	1.5	19.3	97.2	45.1	12.6	54.9
#8	1.5	7.2	80.7	35.2	9.9	64.8
#16	1.4	4.3	64.7	27.9	7.3	72.1
#30	1.3	3.6	48.4	21.1	6.9	78.9
#50	1.3	3.3	27.5	12.5	8.6	87.5
#100	1.3	3.0	5.7	3.5	9.0	96.5
LBW	1.1	2.4	0.8	1.3	2.2	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: **65** **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-32**

Sample Date: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

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	870	5.32	2.62	28.3
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



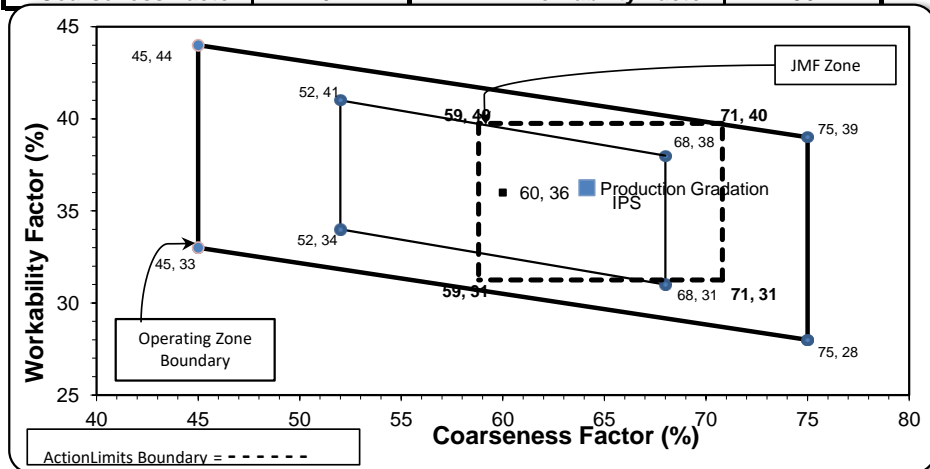
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	42.7	100.0	100.0	82.3	16.8	17.7
3/4"	8.2	98.6	100.0	71.2	11.1	28.8
1/2"	1.8	87.0	100.0	65.9	5.3	34.1
3/8"	1.5	63.3	100.0	59.1	6.8	40.9
#4	1.5	19.3	95.6	44.9	14.3	55.1
#8	1.5	7.2	82.9	36.3	8.6	63.7
#16	1.4	4.3	67.3	29.1	7.2	70.9
#30	1.3	3.6	49.6	21.6	7.4	78.4
#50	1.3	3.3	24.6	11.4	10.3	88.6
#100	1.3	3.0	7.3	4.2	7.1	95.8
LBW	1.1	2.4	1.6	1.7	2.6	98.3

*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:	64	Workability Factor:	36
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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-35**

Sample Date: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1380	8.22	2.69	44.2
IA	58-003	Stoneco	620	3.69	2.69	19.9
2NS	81-093	Burmeister	1120	6.77	2.65	35.9
Total Wt			3120	18.69		100.0

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



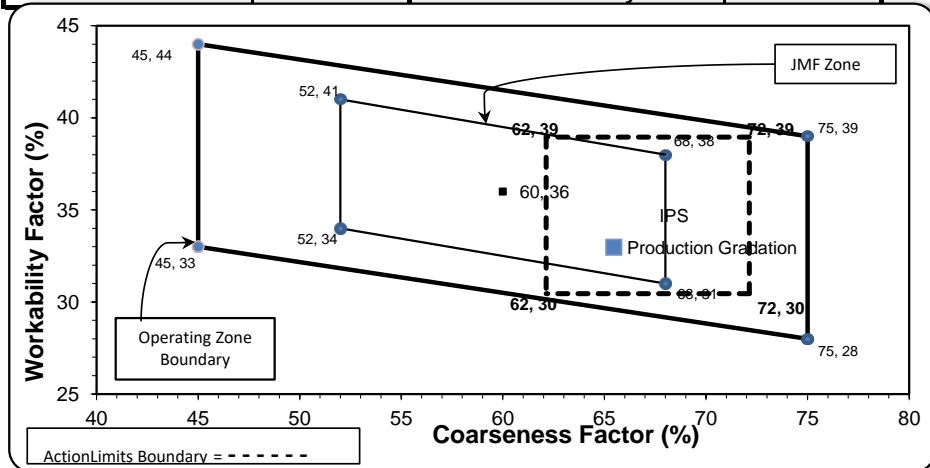
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 Farmington Hills, MI 48336

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"	65.6	100.0	100.0	84.8	15.2	15.2
3/4"	35.4	100.0	100.0	71.4	13.4	28.6
1/2"	12.1	95.0	100.0	60.1	11.3	39.9
3/8"	7.9	84.2	100.0	56.1	4.0	43.9
#4	2.9	24.9	97.2	41.1	15.0	58.9
#8	2.1	7.9	84.9	33.0	8.1	67.0
#16	1.7	3.8	70.1	26.7	6.3	73.3
#30	1.6	2.8	52.1	20.0	6.7	80.0
#50	1.5	2.6	21.1	8.8	11.2	91.2
#100	1.3	2.5	4.4	2.7	6.1	97.3
LBW	1.2	2.2	1.6	1.5	1.1	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-39**

Sample Date: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

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	63-92	Grange Hall	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



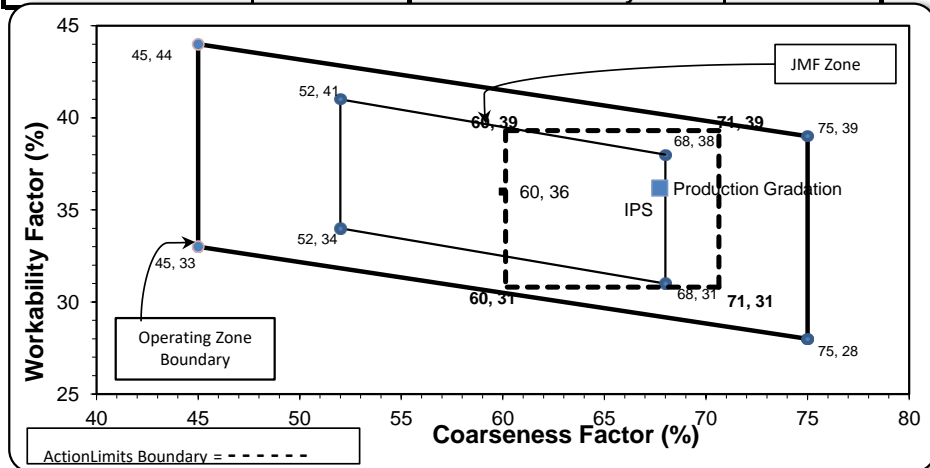
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	49.3	100.0	100.0	82.3	17.7	17.7
3/4"	12.2	98.7	100.0	69.1	13.2	30.9
1/2"	3.4	83.2	100.0	62.2	6.9	37.8
3/8"	2.5	62.2	100.0	56.8	5.4	43.2
#4	1.9	12.9	98.1	43.8	13.0	56.2
#8	1.7	3.7	85.2	36.2	7.6	63.8
#16	1.7	2.0	70.0	29.6	6.6	70.4
#30	1.6	1.7	52.0	22.1	7.4	77.9
#50	1.5	1.6	22.2	10.0	12.2	90.0
#100	1.5	1.5	3.0	2.1	7.8	97.9
LBW	1.3	1.4	0.4	1.0	1.2	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:	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"	99.6	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: 12/6/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/7/2021 through 12/13/2021

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	870	5.32	2.62	28.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



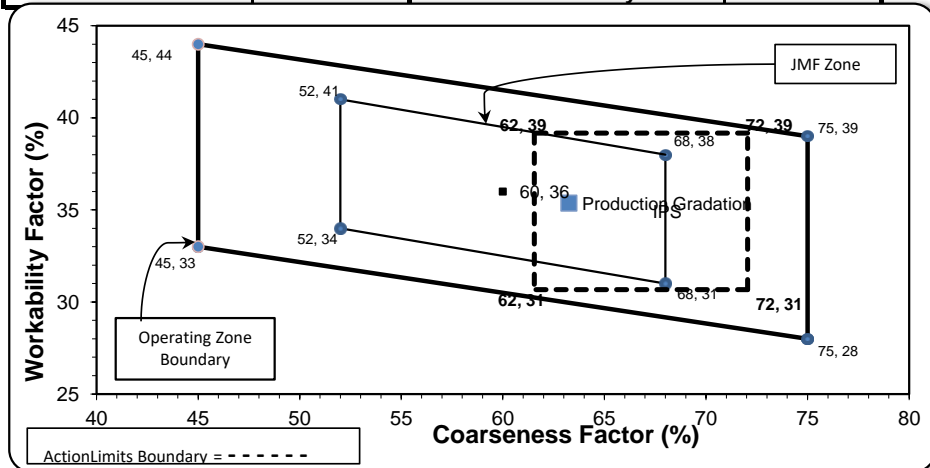
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	42.7	100.0	100.0	82.3	16.8	17.7
3/4"	8.2	98.6	100.0	71.2	11.1	28.8
1/2"	1.8	87.0	100.0	65.9	5.3	34.1
3/8"	1.5	63.3	100.0	59.1	6.8	40.9
#4	1.5	19.3	97.2	45.5	13.6	54.5
#8	1.5	7.2	80.7	35.4	10.1	64.6
#16	1.4	4.3	64.7	28.0	7.4	72.0
#30	1.3	3.6	48.4	21.1	6.9	78.9
#50	1.3	3.3	27.5	12.5	8.6	87.5
#100	1.3	3.0	5.7	3.6	9.0	96.4
LBW	1.1	2.4	0.8	1.3	2.2	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:	63	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: