

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

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	63-115	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"	98.4	100.0	100.0	99.4	0.6	0.6
1"	48.6	100.0	100.0	82.1	17.4	17.9
3/4"	17.0	98.8	100.0	70.8	11.3	29.2
1/2"	5.1	81.0	100.0	62.0	8.8	38.0
3/8"	3.6	60.0	100.0	56.0	6.0	44.0
#4	2.4	12.3	97.0	42.0	14.0	58.0
#8	2.0	3.7	79.4	32.7	9.3	67.3
#16	1.9	2.3	63.2	26.0	6.7	74.0
#30	1.8	2.1	47.0	19.5	6.4	80.5
#50	1.8	2.0	26.2	11.4	8.2	88.6
#100	1.6	1.9	4.3	2.7	8.7	97.3
LBW	1.4	1.7	0.6	1.2	1.6	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.

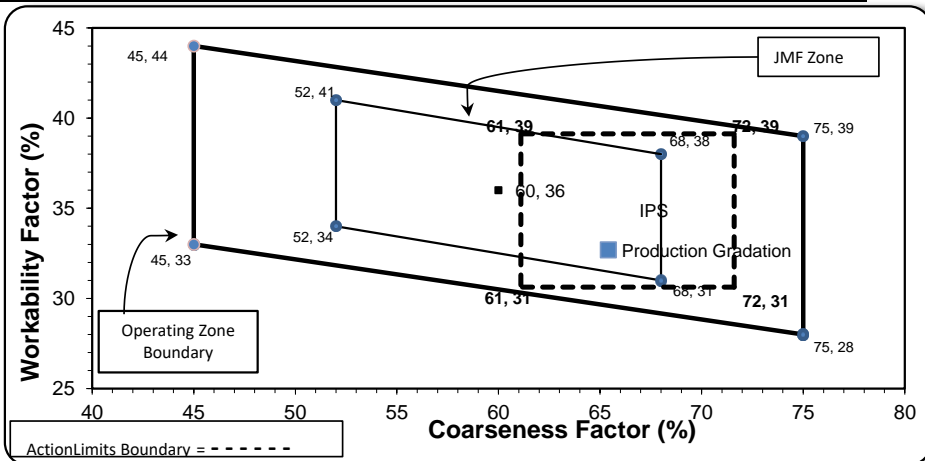
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	65	Workability Factor:	33
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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: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1450	8.64	2.69	46.5
IA	58-003	Stoneco	520	3.10	2.69	16.7
2NS	81-019	Pleasant Lake	1150	6.95	2.65	36.9
Total Wt			3120	18.69		100.0

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



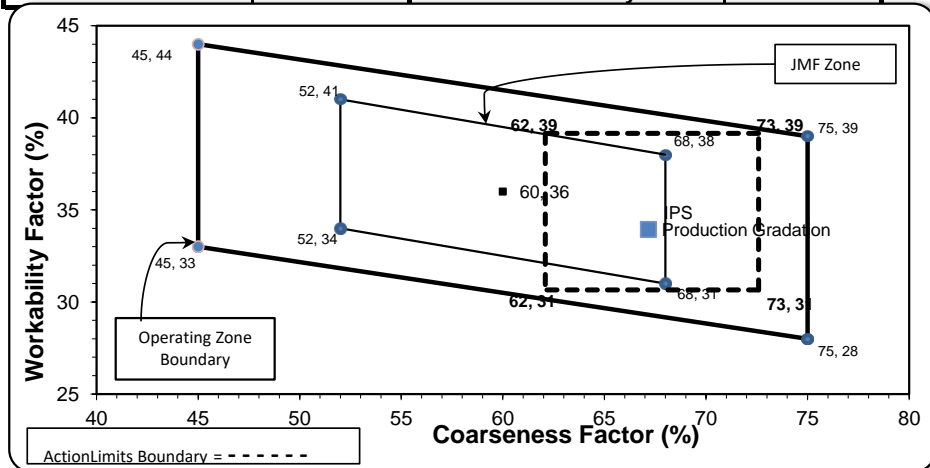
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	65.1	100.0	100.0	83.8	16.2	16.2
3/4"	44.3	100.0	100.0	74.1	9.7	25.9
1/2"	19.2	94.1	100.0	61.5	12.6	38.5
3/8"	14.0	73.6	100.0	55.6	5.8	44.4
#4	4.7	21.1	99.4	42.3	13.3	57.7
#8	2.9	6.5	85.5	33.9	8.4	66.1
#16	2.5	3.4	67.7	26.7	7.3	73.3
#30	2.0	2.5	48.8	19.3	7.3	80.7
#50	1.8	2.3	23.8	10.0	9.3	90.0
#100	1.7	2.2	6.5	3.6	6.4	96.4
LBW	1.4	1.8	2.0	1.7	1.9	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:	67	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: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

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

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



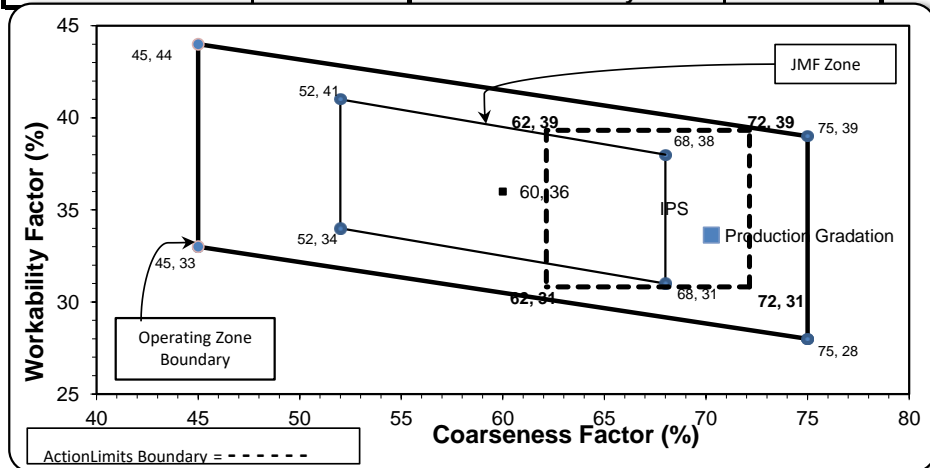
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 30701 W. 10 Mile Rd.
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 Farmington Hills, MI 48336

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"	41.1	100.0	100.0	80.4	19.6	19.6
3/4"	8.1	99.7	100.0	69.4	11.0	30.6
1/2"	1.1	72.3	100.0	59.9	9.5	40.1
3/8"	0.9	47.4	100.0	53.4	6.6	46.6
#4	0.8	9.2	97.0	42.2	11.2	57.8
#8	0.8	4.0	79.4	33.6	8.5	66.4
#16	0.8	3.1	63.2	26.8	6.8	73.2
#30	0.7	2.6	47.0	20.0	6.8	80.0
#50	0.7	2.4	26.2	11.5	8.5	88.5
#100	0.6	2.2	4.3	2.5	9.0	97.5
LBW	0.4	1.9	0.6	0.9	1.7	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: **70** **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"	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: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

Contractor: _____

MDOT No.: _____



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

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	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

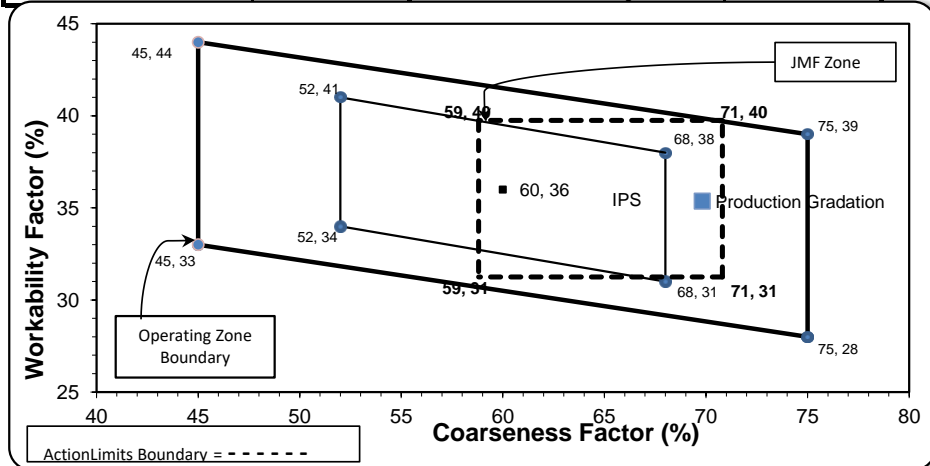
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	41.1	100.0	100.0	82.3	17.7	17.7
3/4"	8.1	99.7	100.0	72.4	10.0	27.6
1/2"	1.1	72.3	100.0	62.2	10.1	37.8
3/8"	0.9	47.4	100.0	54.9	7.4	45.1
#4	0.8	9.2	96.1	42.1	12.8	57.9
#8	0.8	4.0	83.4	35.4	6.7	64.6
#16	0.8	3.1	68.2	28.9	6.5	71.1
#30	0.7	2.6	48.9	20.9	8.0	79.1
#50	0.7	2.4	24.7	11.0	9.9	89.0
#100	0.6	2.2	7.8	4.0	7.0	96.0
LBW	0.4	1.9	1.9	1.5	2.6	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: **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: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1450	8.64	2.69	46.5
IA	58-003	Stoneco	520	3.10	2.69	16.7
2NS	81-019	Pleasant Lake	1150	6.95	2.65	36.9
Total Wt			3120	18.69		100.0

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



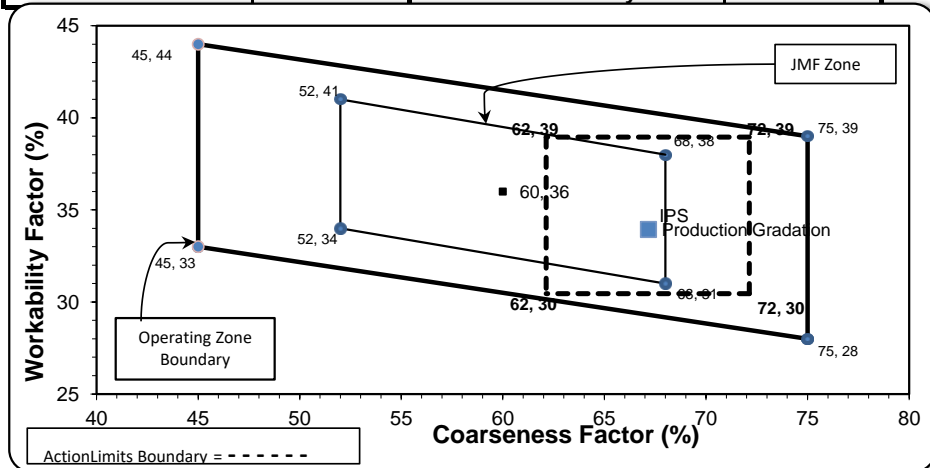
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	65.1	100.0	100.0	83.8	16.2	16.2
3/4"	44.3	100.0	100.0	74.1	9.7	25.9
1/2"	19.2	94.1	100.0	61.5	12.6	38.5
3/8"	14.0	73.6	100.0	55.6	5.8	44.4
#4	4.7	21.1	99.4	42.3	13.3	57.7
#8	2.9	6.5	85.5	33.9	8.4	66.1
#16	2.5	3.4	67.7	26.7	7.3	73.3
#30	2.0	2.5	48.8	19.3	7.3	80.7
#50	1.8	2.3	23.8	10.0	9.3	90.0
#100	1.7	2.2	6.5	3.6	6.4	96.4
LBW	1.4	1.8	2.0	1.7	1.9	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: **67** **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"	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: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

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%



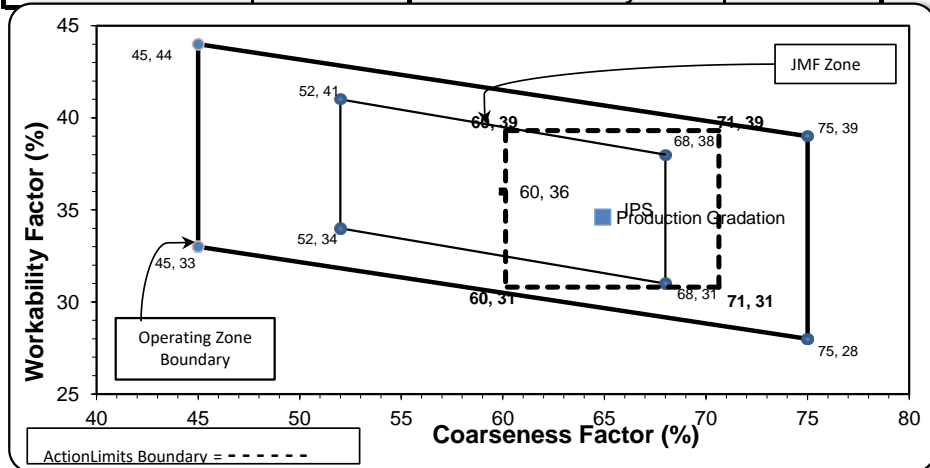
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.5	0.5	0.5
1"	48.6	100.0	100.0	82.9	16.5	17.1
3/4"	17.0	98.8	100.0	72.1	10.8	27.9
1/2"	5.1	81.0	100.0	63.5	8.6	36.5
3/8"	3.6	60.0	100.0	57.5	6.0	42.5
#4	2.4	12.3	97.4	43.7	13.9	56.3
#8	2.0	3.7	81.0	34.6	9.1	65.4
#16	1.9	2.3	65.3	27.8	6.8	72.2
#30	1.8	2.1	48.2	20.8	7.0	79.2
#50	1.8	2.0	22.6	10.3	10.4	89.7
#100	1.6	1.9	6.0	3.5	6.9	96.5
LBW	1.4	1.7	0.9	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: 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: 3/21/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 3/22/2022 through 3/28/2022

Contractor: _____

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	850	5.20	2.62	27.7
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



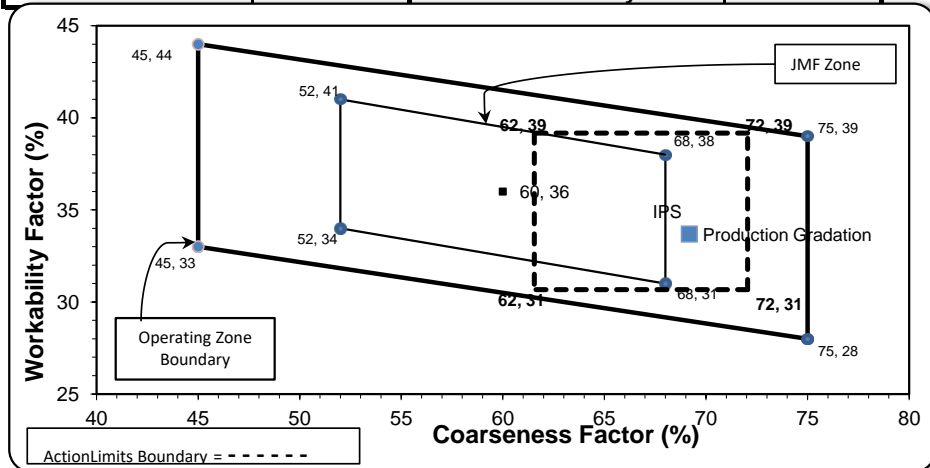
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	41.1	100.0	100.0	81.4	18.6	18.6
3/4"	8.1	99.7	100.0	70.9	10.5	29.1
1/2"	1.1	72.3	100.0	61.1	9.8	38.9
3/8"	0.9	47.4	100.0	54.1	7.0	45.9
#4	0.8	9.2	97.0	42.3	11.8	57.7
#8	0.8	4.0	79.4	33.7	8.6	66.3
#16	0.8	3.1	63.2	26.8	6.8	73.2
#30	0.7	2.6	47.0	20.1	6.8	79.9
#50	0.7	2.4	26.2	11.6	8.5	88.4
#100	0.6	2.2	4.3	2.5	9.0	97.5
LBW	0.4	1.9	0.6	0.9	1.7	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: **69** **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: