

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 5/17/21 Concrete Grade: **P1M**
 Dates Test Represents: 5/18/2021 through 5/24/2021

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"	97.3	100.0	100.0	99.1	0.9	0.9
1"	49.4	100.0	100.0	82.4	16.7	17.6
3/4"	15.0	98.5	100.0	70.0	12.4	30.0
1/2"	3.8	77.9	100.0	60.7	9.3	39.3
3/8"	2.5	52.4	100.0	53.6	7.1	46.4
#4	1.8	12.6	99.0	42.6	11.0	57.4
#8	1.7	3.5	83.4	34.1	8.5	65.9
#16	1.7	2.4	67.9	27.8	6.3	72.2
#30	1.6	2.0	51.6	21.2	6.5	78.8
#50	1.5	1.9	25.7	11.1	10.2	88.9
#100	1.4	1.8	6.9	3.7	7.4	96.3
LBW	1.2	1.6	0.7	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

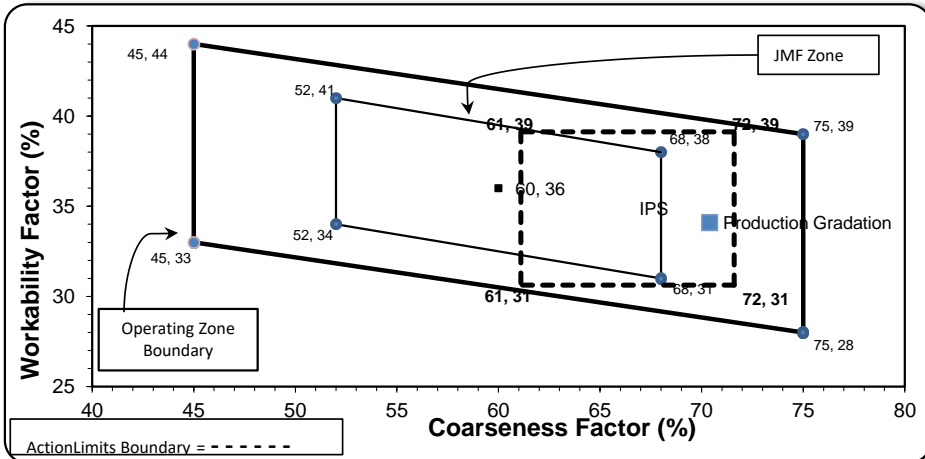
Coarseness Factor: **70** **Workability Factor:** **34**

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: 5/17/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/18/2021 through 5/24/2021

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%



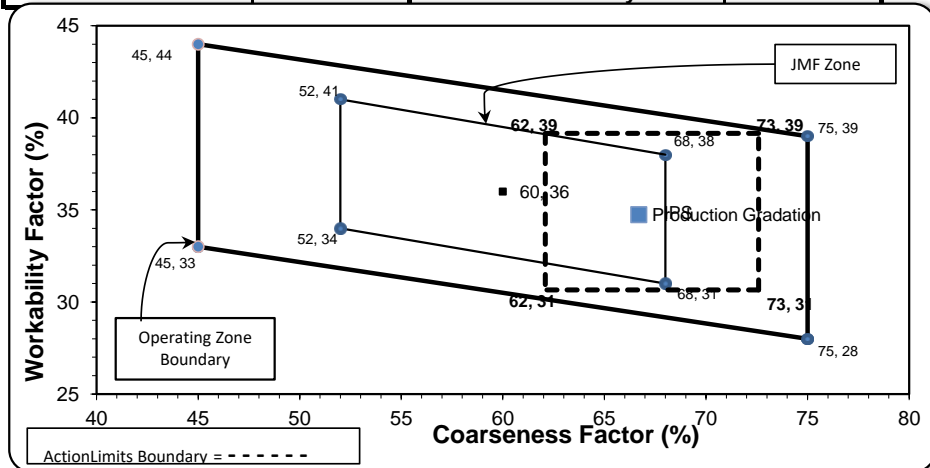
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	65.4	100.0	100.0	84.3	15.7	15.7
3/4"	41.1	100.0	100.0	73.2	11.1	26.8
1/2"	18.6	94.2	100.0	62.0	11.2	38.0
3/8"	11.6	79.5	100.0	56.5	5.5	43.5
#4	3.3	26.6	99.2	43.9	12.6	56.1
#8	1.9	6.7	85.3	34.7	9.2	65.3
#16	1.7	3.2	68.6	27.7	7.1	72.3
#30	1.6	2.2	50.6	20.5	7.1	79.5
#50	1.5	2.0	21.7	9.3	11.2	90.7
#100	1.5	1.9	3.4	2.3	7.1	97.7
LBW	1.3	1.7	0.6	1.1	1.2	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: **67** **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"	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: 5/17/21 Concrete Grade: **P1M**
 Dates Test Represents: 5/18/2021 through 5/24/2021

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1000	6.12	2.62	32.6
IA	71-47	Presque Isle	820	5.02	2.62	26.7
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



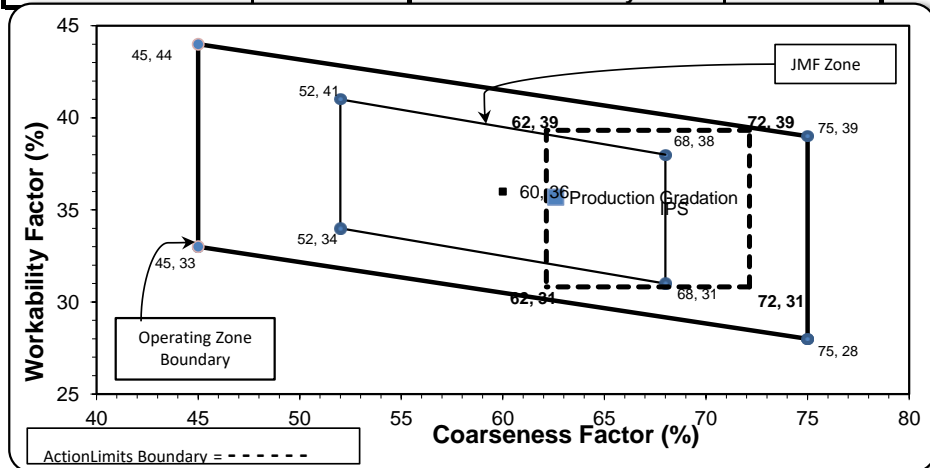
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.9	1.1	1.1
1"	43.1	100.0	100.0	81.5	17.4	18.5
3/4"	11.5	98.8	100.0	70.9	10.6	29.1
1/2"	4.8	87.7	100.0	65.7	5.1	34.3
3/8"	3.7	66.7	100.0	59.7	6.0	40.3
#4	2.6	17.1	96.6	44.7	15.0	55.3
#8	2.1	5.9	82.1	35.7	9.1	64.3
#16	1.9	3.9	68.0	29.3	6.3	70.7
#30	1.8	3.2	51.5	22.4	6.9	77.6
#50	1.7	2.8	25.7	11.8	10.6	88.2
#100	1.6	2.3	5.0	3.2	8.6	96.8
LBW	1.2	1.7	0.6	1.1	2.1	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:	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: 5/17/21 Concrete Grade: **P1M**
 Dates Test Represents: 5/18/2021 through 5/24/2021

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

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



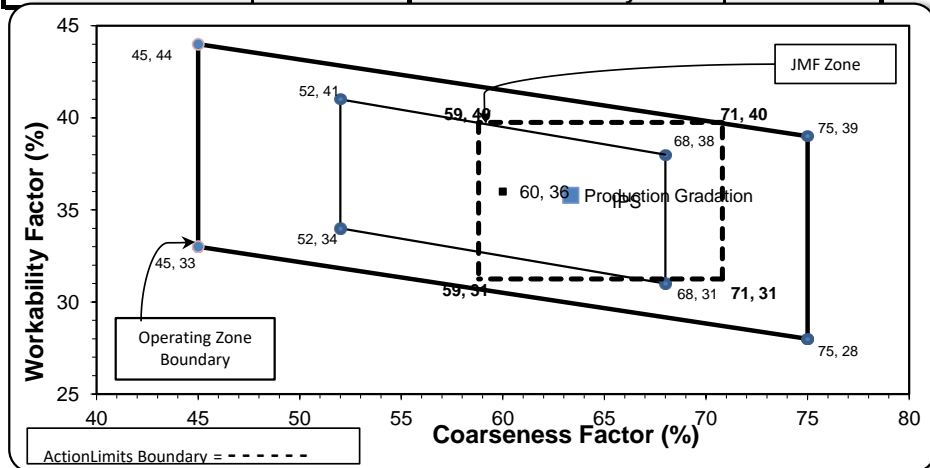
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.8	1.2	1.2
1"	43.1	100.0	100.0	81.1	17.7	18.9
3/4"	11.5	98.8	100.0	70.3	10.8	29.7
1/2"	4.8	87.7	100.0	65.2	5.1	34.8
3/8"	3.7	66.7	100.0	59.3	5.8	40.7
#4	2.6	17.1	95.8	44.3	15.0	55.7
#8	2.1	5.9	82.4	35.8	8.5	64.2
#16	1.9	3.9	65.6	28.4	7.4	71.6
#30	1.8	3.2	47.2	20.7	7.7	79.3
#50	1.7	2.8	21.4	10.0	10.6	90.0
#100	1.6	2.3	4.8	3.1	6.9	96.9
LBW	1.2	1.7	1.3	1.4	1.7	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: **63** **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

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 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 5/17/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/18/2021 through 5/24/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1050	6.42	2.62	34.2
IA	71-47	Presque Isle	820	5.02	2.62	26.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



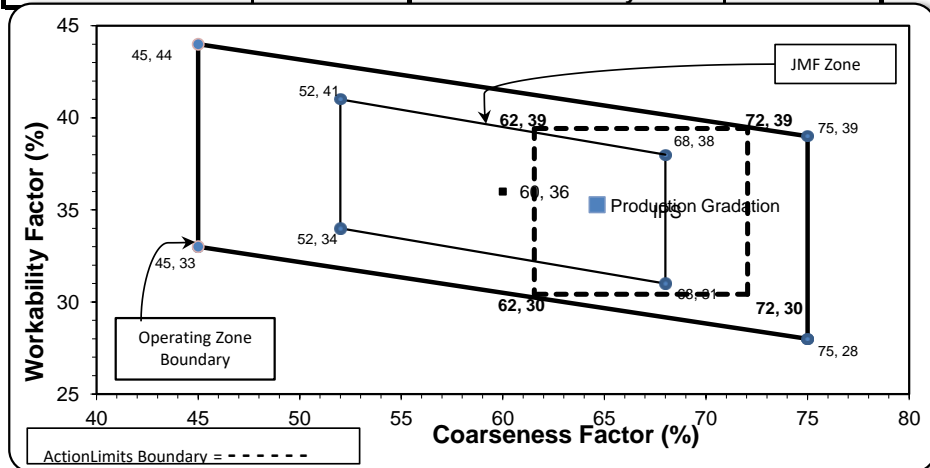
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.8	1.2	1.2
1"	43.1	100.0	100.0	80.5	18.3	19.5
3/4"	11.5	98.8	100.0	69.4	11.1	30.6
1/2"	4.8	87.7	100.0	64.2	5.3	35.8
3/8"	3.7	66.7	100.0	58.2	6.0	41.8
#4	2.6	17.1	97.4	43.5	14.6	56.5
#8	2.1	5.9	84.4	35.3	8.2	64.7
#16	1.9	3.9	69.7	28.9	6.3	71.1
#30	1.8	3.2	50.1	21.1	7.9	78.9
#50	1.7	2.8	23.7	10.6	10.5	89.4
#100	1.6	2.3	3.6	2.6	8.0	97.4
LBW	1.2	1.7	0.6	1.1	1.5	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:** **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"	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: 5/17/21 Concrete Grade: **P1M**
 Dates Test Represents: 5/18/2021 through 5/24/2021

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	750	4.59	2.62	24.4
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%



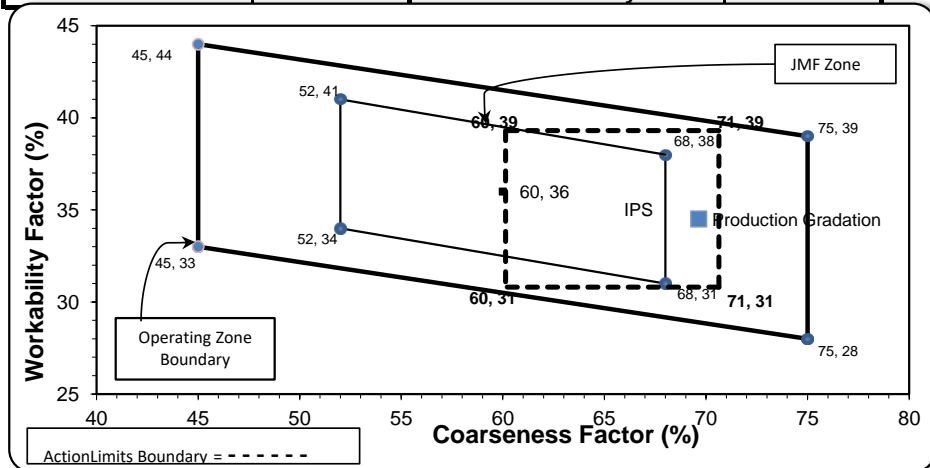
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.1	0.9	0.9
1"	49.4	100.0	100.0	82.4	16.7	17.6
3/4"	15.0	98.5	100.0	70.0	12.4	30.0
1/2"	3.8	77.9	100.0	61.1	8.9	38.9
3/8"	2.5	52.4	100.0	54.4	6.7	45.6
#4	1.8	12.6	97.4	43.4	11.0	56.6
#8	1.7	3.5	81.2	34.5	8.9	65.5
#16	1.7	2.4	66.8	28.4	6.1	71.6
#30	1.6	2.0	52.2	22.3	6.1	77.7
#50	1.5	1.9	28.9	12.8	9.5	87.2
#100	1.4	1.8	7.7	4.1	8.7	95.9
LBW	1.2	1.6	0.7	1.1	3.0	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:** **35**



Initial Production Sample (IPS)

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: 5/17/21 Concrete Grade: **P1M**
 Dates Test Represents: 5/18/2021 through 5/24/2021

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%



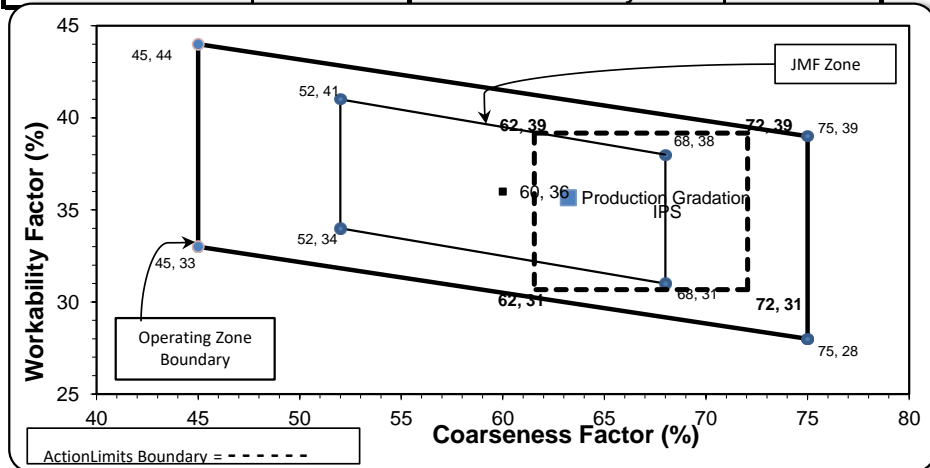
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.8	1.2	1.2
1"	43.1	100.0	100.0	81.1	17.7	18.9
3/4"	11.5	98.8	100.0	70.3	10.8	29.7
1/2"	4.8	87.7	100.0	65.2	5.1	34.8
3/8"	3.7	66.7	100.0	59.3	5.8	40.7
#4	2.6	17.1	96.6	44.7	14.7	55.3
#8	2.1	5.9	82.1	35.7	9.0	64.3
#16	1.9	3.9	68.0	29.3	6.3	70.7
#30	1.8	3.2	51.5	22.4	6.9	77.6
#50	1.7	2.8	25.7	11.8	10.6	88.2
#100	1.6	2.3	5.0	3.2	8.6	96.8
LBW	1.2	1.7	0.6	1.1	2.1	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**



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: