

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/19/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/20/2020 through 10/26/2020

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"	96.2	100.0	100.0	98.9	1.1	1.1
1"	48.1	100.0	100.0	84.4	14.4	15.6
3/4"	16.1	97.0	100.0	73.9	10.5	26.1
1/2"	4.9	73.9	100.0	63.4	10.5	36.6
3/8"	3.5	40.2	100.0	52.6	10.8	47.4
#4	2.2	8.9	98.1	41.8	10.8	58.2
#8	1.8	2.9	80.4	32.9	8.9	67.1
#16	1.8	2.2	63.3	26.0	6.9	74.0
#30	1.7	2.1	47.8	19.8	6.1	80.2
#50	1.6	2.0	24.0	10.5	9.4	89.5
#100	1.6	1.9	4.7	2.9	7.6	97.1
LBW	1.4	1.5	0.8	1.2	1.7	98.8

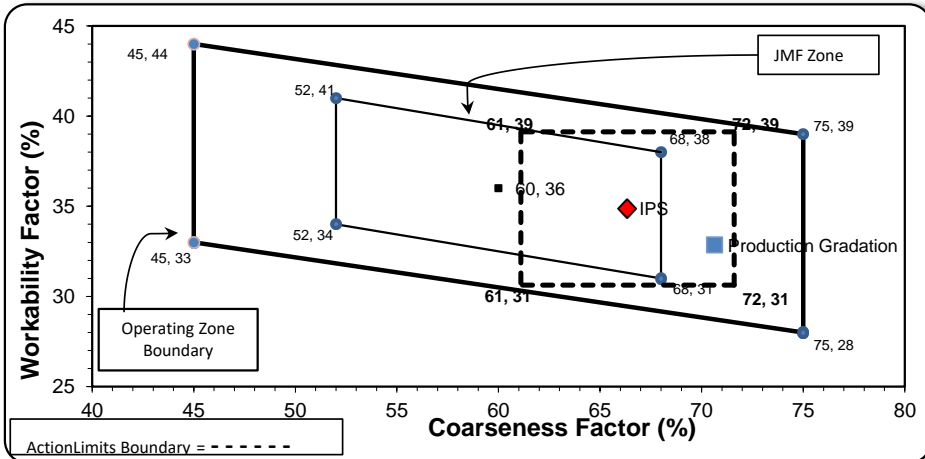
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	71	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

Contractor: _____

Sample Date: 10/19/20

Concrete Grade: P1M

Dates Test Represents: 10/20/2020 through 10/26/2020

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%



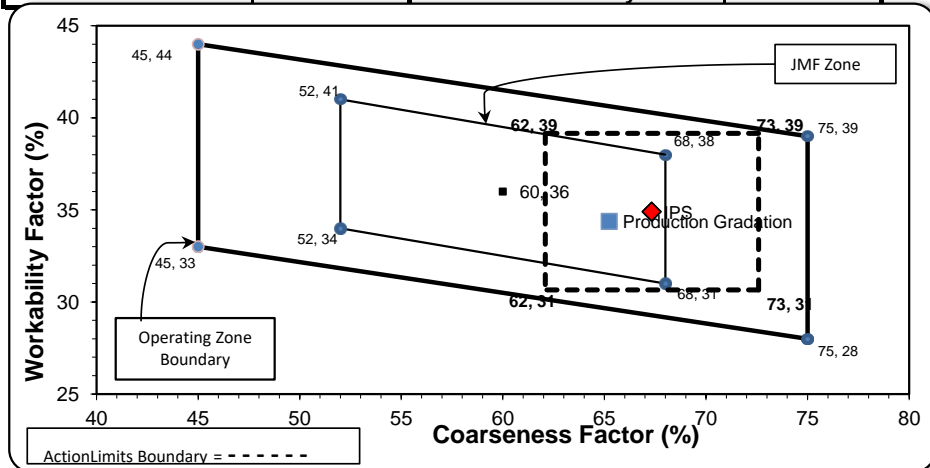
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 Suite 500
 Farmington Hills, MI 48336

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"	66.6	100.0	100.0	84.8	15.2	15.2
3/4"	49.0	100.0	100.0	76.8	8.0	23.2
1/2"	18.0	94.3	100.0	61.8	15.0	38.2
3/8"	11.7	83.6	100.0	57.2	4.6	42.8
#4	3.6	26.9	99.0	44.0	13.2	56.0
#8	1.9	7.0	84.2	34.4	9.7	65.6
#16	1.6	3.3	67.0	27.0	7.3	73.0
#30	1.5	2.1	48.2	19.6	7.5	80.4
#50	1.3	1.8	18.7	8.1	11.5	91.9
#100	1.3	1.7	3.4	2.2	5.9	97.8
LBW	1.1	1.4	0.3	0.8	1.3	99.2

*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:	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: 10/19/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/20/2020 through 10/26/2020

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%



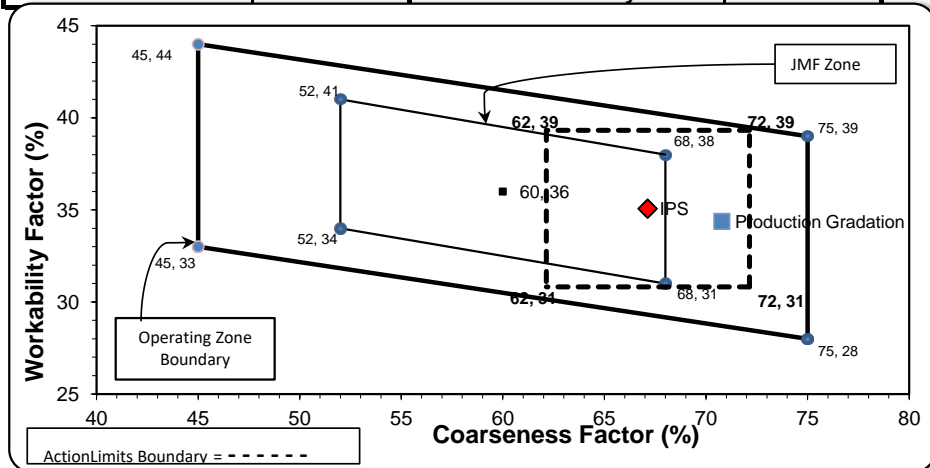
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	48.1	100.0	100.0	84.4	14.4	15.6
3/4"	16.1	97.0	100.0	74.0	10.5	26.0
1/2"	4.9	73.9	100.0	63.8	10.1	36.2
3/8"	3.5	40.2	100.0	53.6	10.3	46.4
#4	2.2	8.9	97.9	43.1	10.4	56.9
#8	1.8	2.9	81.0	34.4	8.8	65.6
#16	1.8	2.2	64.7	27.5	6.8	72.5
#30	1.7	2.1	48.4	20.8	6.7	79.2
#50	1.6	2.0	22.2	10.1	10.7	89.9
#100	1.6	1.9	3.7	2.5	7.6	97.5
LBW	1.4	1.5	0.3	1.0	1.6	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: **71** 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-20

Contractor: _____

Sample Date: 10/19/20

Concrete Grade: P1M

Dates Test Represents: 10/20/2020 through 10/26/2020

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%



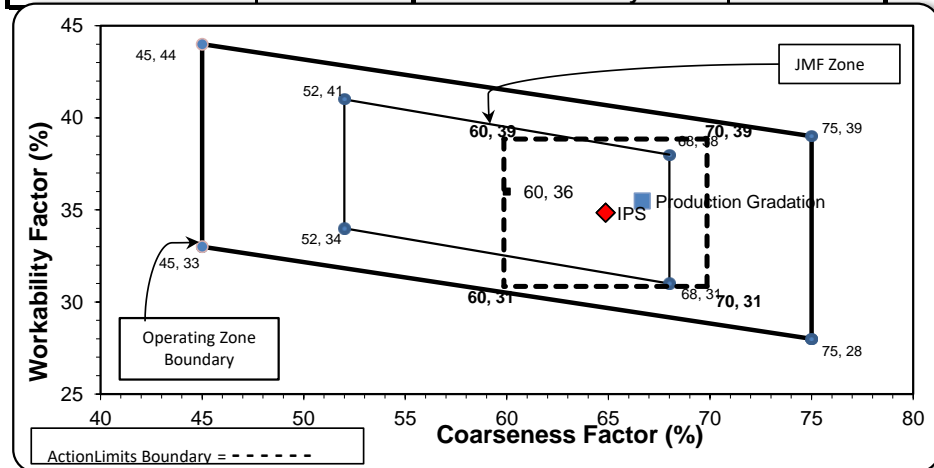
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 Suite 500
 Farmington Hills, MI 48336

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"	36.3	100.0	100.0	80.3	18.8	19.7
3/4"	9.2	98.1	100.0	71.3	9.0	28.7
1/2"	2.0	78.9	100.0	63.4	8.0	36.6
3/8"	1.5	58.2	100.0	57.0	6.4	43.0
#4	1.2	13.4	97.5	42.5	14.5	57.5
#8	1.1	5.1	86.0	35.5	7.0	64.5
#16	1.0	3.4	71.8	29.4	6.1	70.6
#30	1.0	2.9	49.4	20.5	8.9	79.5
#50	0.9	2.7	18.2	8.2	12.3	91.8
#100	0.8	2.5	2.4	1.9	6.3	98.1
LBW	0.7	2.3	0.4	1.1	0.9	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
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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

Contractor: _____

Sample Date: 10/19/20

Concrete Grade: P1M

Dates Test Represents: 10/20/2020 through 10/26/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	790	4.83	2.62	25.7
IA	71-47	Presque Isle	1030	6.30	2.62	33.6
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



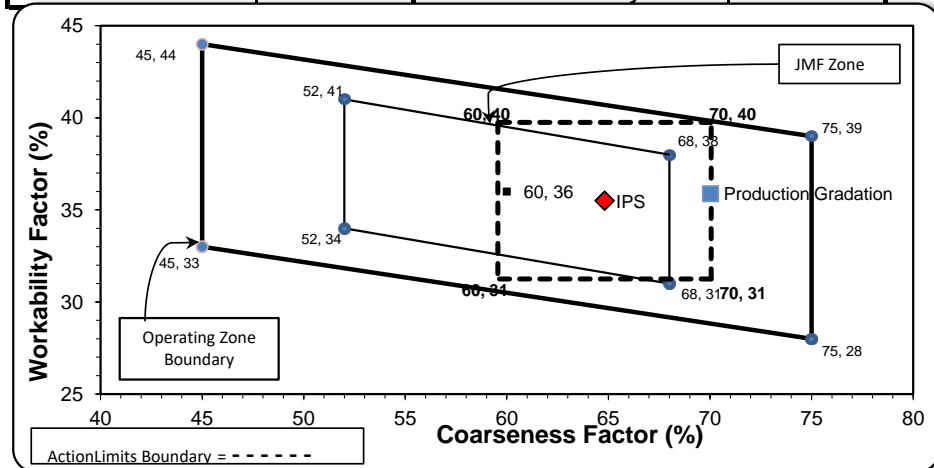
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 Suite 500
 Farmington Hills, MI 48336

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	99.0	1.0	1.0
1"	48.1	100.0	100.0	86.6	12.4	13.4
3/4"	16.1	97.0	100.0	77.4	9.2	22.6
1/2"	4.9	73.9	100.0	66.8	10.6	33.2
3/8"	3.5	40.2	100.0	55.1	11.7	44.9
#4	2.2	8.9	96.9	43.0	12.1	57.0
#8	1.8	2.9	84.6	35.9	7.1	64.1
#16	1.8	2.2	68.7	29.2	6.7	70.8
#30	1.7	2.1	48.7	21.0	8.2	79.0
#50	1.6	2.0	23.5	10.7	10.3	89.3
#100	1.6	1.9	6.1	3.5	7.1	96.5
LBW	1.4	1.5	0.9	1.2	2.3	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:	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-36**

Sample Date: 10/19/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/20/2020 through 10/26/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



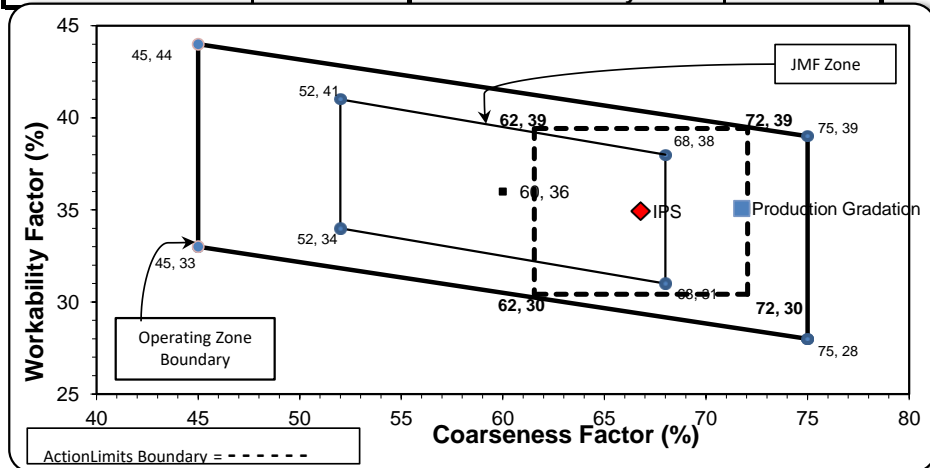
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	48.1	100.0	100.0	85.6	13.3	14.4
3/4"	16.1	97.0	100.0	75.8	9.9	24.2
1/2"	4.9	73.9	100.0	65.0	10.8	35.0
3/8"	3.5	40.2	100.0	53.4	11.6	46.6
#4	2.2	8.9	97.5	41.7	11.7	58.3
#8	1.8	2.9	86.0	35.1	6.6	64.9
#16	1.8	2.2	71.8	29.3	5.8	70.7
#30	1.7	2.1	49.4	20.5	8.8	79.5
#50	1.6	2.0	18.2	8.2	12.3	91.8
#100	1.6	1.9	2.4	2.0	6.2	98.0
LBW	1.4	1.5	0.4	1.0	1.0	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:	72	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: 10/19/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/20/2020 through 10/26/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
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%



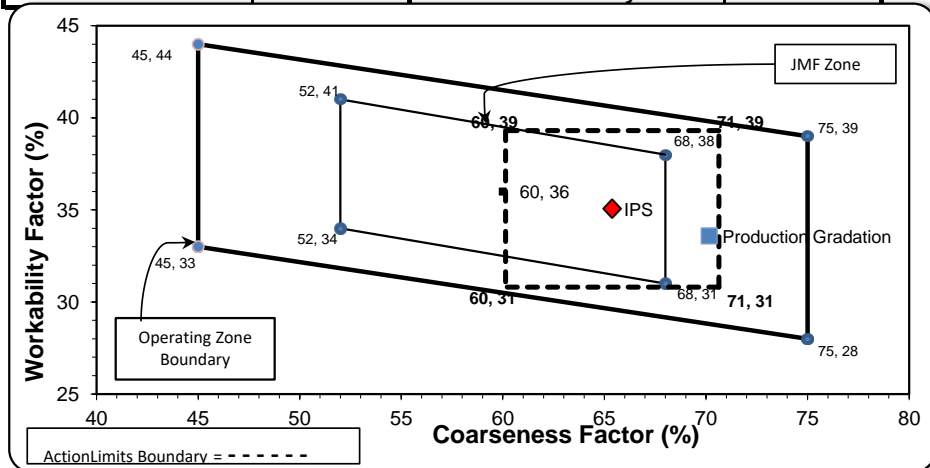
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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	98.9	1.1	1.1
1"	48.1	100.0	100.0	85.6	13.3	14.4
3/4"	16.1	97.0	100.0	75.8	9.9	24.2
1/2"	4.9	73.9	100.0	65.0	10.8	35.0
3/8"	3.5	40.2	100.0	53.4	11.6	46.6
#4	2.2	8.9	96.2	41.2	12.2	58.8
#8	1.8	2.9	82.2	33.6	7.6	66.4
#16	1.8	2.2	66.8	27.3	6.3	72.7
#30	1.7	2.1	52.2	21.6	5.8	78.4
#50	1.6	2.0	26.3	11.4	10.2	88.6
#100	1.6	1.9	7.1	3.8	7.5	96.2
LBW	1.4	1.5	0.8	1.2	2.7	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:	70	Workability Factor:	34
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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-O2**

Sample Date: 10/19/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/20/2020 through 10/26/2020

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%



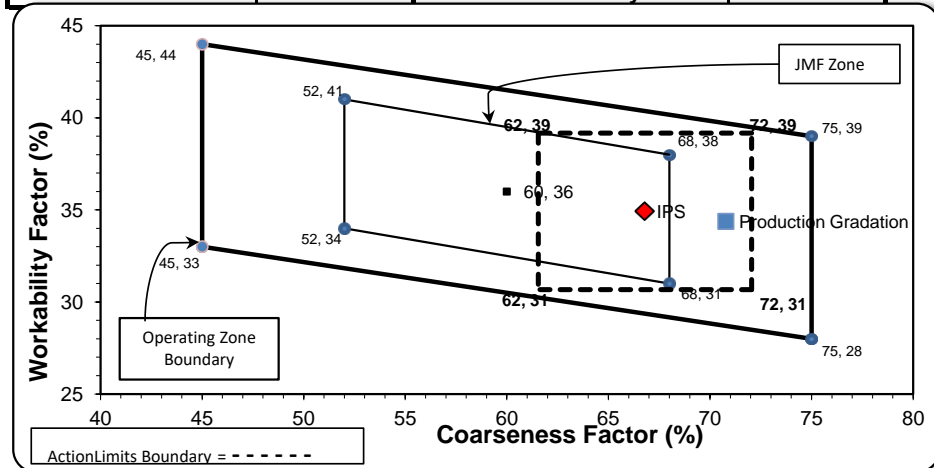
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	48.1	100.0	100.0	84.4	14.4	15.6
3/4"	16.1	97.0	100.0	74.0	10.5	26.0
1/2"	4.9	73.9	100.0	63.8	10.1	36.2
3/8"	3.5	40.2	100.0	53.6	10.3	46.4
#4	2.2	8.9	97.9	43.1	10.4	56.9
#8	1.8	2.9	81.0	34.4	8.8	65.6
#16	1.8	2.2	64.7	27.5	6.8	72.5
#30	1.7	2.1	48.4	20.8	6.7	79.2
#50	1.6	2.0	22.2	10.1	10.7	89.9
#100	1.6	1.9	3.7	2.5	7.6	97.5
LBW	1.4	1.5	0.3	1.0	1.6	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:	71	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"	85.0	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: