

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 3/2/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/3/2020 through 3/9/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	900	5.50	2.62	29.3
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-115	Ray Rd	1270	7.68	2.65	41.4
Total Wt			3070	18.69		100.0

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



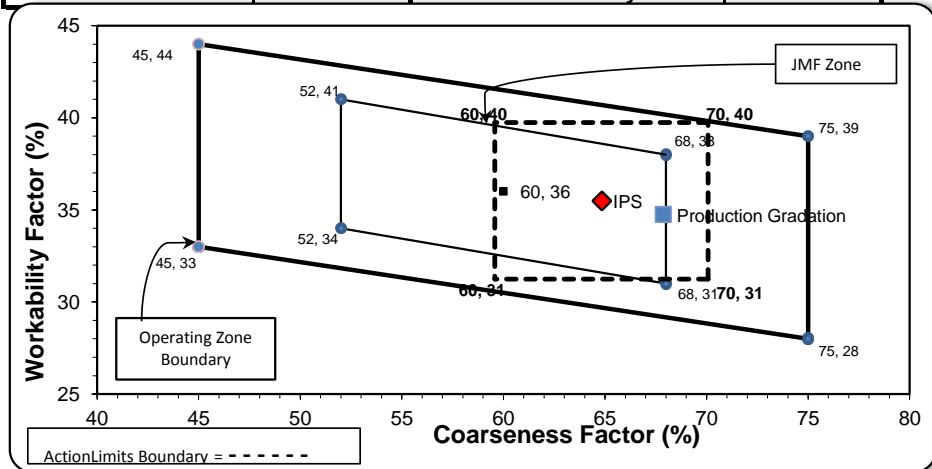
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.3	100.0	100.0	98.6	1.4	1.4
1"	33.4	100.0	100.0	80.5	18.1	19.5
3/4"	10.3	96.8	100.0	72.8	7.7	27.2
1/2"	3.5	74.0	100.0	64.1	8.7	35.9
3/8"	2.7	46.2	100.0	55.7	8.4	44.3
#4	2.2	13.2	95.5	44.0	11.7	56.0
#8	2.0	6.3	78.1	34.7	9.3	65.3
#16	2.0	4.6	62.2	27.7	7.1	72.3
#30	1.8	4.1	47.7	21.5	6.2	78.5
#50	1.8	3.8	25.6	12.2	9.2	87.8
#100	1.7	3.4	5.5	3.8	8.5	96.2
LBW	1.3	2.6	1.0	1.6	2.2	98.4

*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:	35
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Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.4	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: 3/2/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/3/2020 through 3/9/2020

MDOT No.: _____

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

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



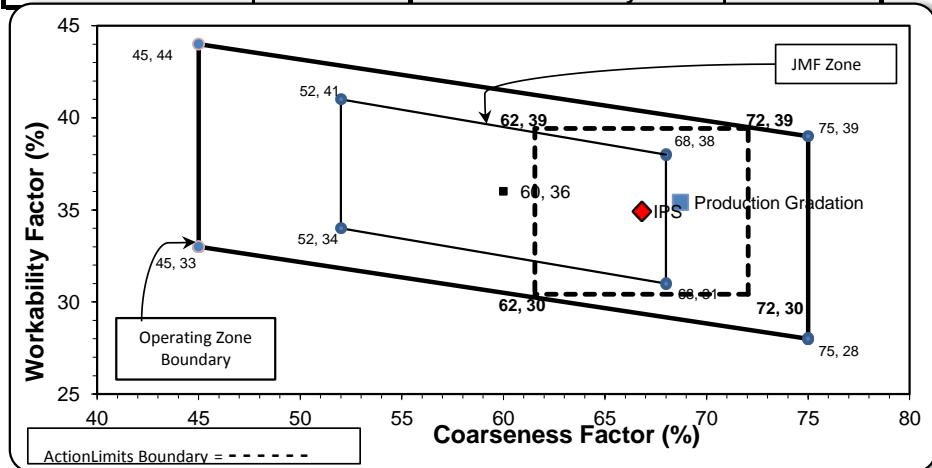
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.3	100.0	100.0	98.7	1.3	1.3
1"	33.4	100.0	100.0	82.2	16.5	17.8
3/4"	10.3	96.8	100.0	74.9	7.3	25.1
1/2"	3.5	74.0	100.0	65.3	9.6	34.7
3/8"	2.7	46.2	100.0	55.6	9.7	44.4
#4	2.2	13.2	97.2	43.1	12.5	56.9
#8	2.0	6.3	83.7	35.4	7.7	64.6
#16	2.0	4.6	68.7	29.0	6.4	71.0
#30	1.8	4.1	49.3	21.2	7.8	78.8
#50	1.8	3.8	19.7	9.5	11.7	90.5
#100	1.7	3.4	2.9	2.8	6.7	97.2
LBW	1.3	2.6	0.3	1.4	1.4	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:	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"	72.1	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: 3/2/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/3/2020 through 3/9/2020

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	850	5.20	2.62	27.7
2NS	63-92	Grange Hall	1220	7.38	2.65	39.7
Total Wt			3070	18.69		100.0

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



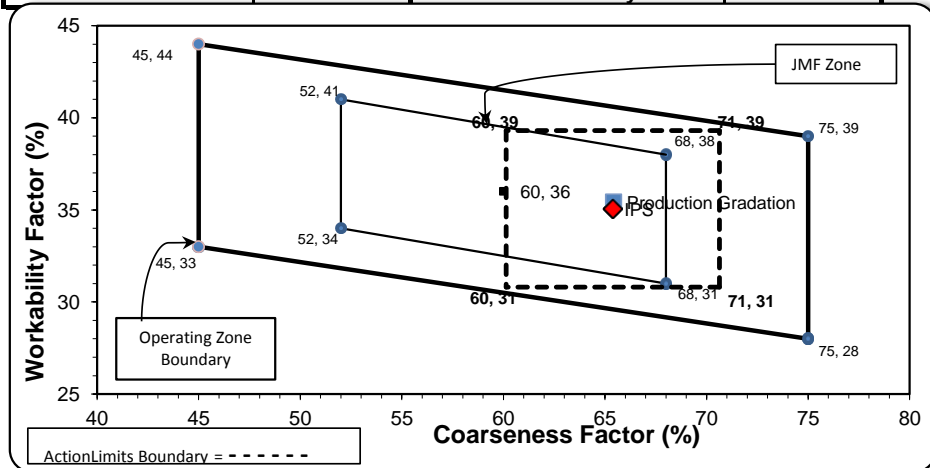
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 30701 W. 10 Mile Rd.
 Suite 500
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.4	0.6	0.6
1"	40.6	100.0	100.0	80.7	18.8	19.3
3/4"	12.2	99.0	100.0	71.1	9.5	28.9
1/2"	3.7	83.9	100.0	64.2	6.9	35.8
3/8"	2.6	62.0	100.0	57.8	6.4	42.2
#4	1.9	15.8	97.2	43.6	14.1	56.4
#8	1.7	5.8	83.7	35.4	8.2	64.6
#16	1.6	3.5	68.7	28.8	6.6	71.2
#30	1.5	2.9	49.3	20.9	7.9	79.1
#50	1.4	2.6	19.7	9.0	11.9	91.0
#100	1.3	2.4	2.9	2.2	6.8	97.8
LBW	1.1	2.2	0.3	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:	65	Workability Factor:	35
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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: 3/2/20

Concrete Grade: P1M

Contractor: _____

Dates Test Represents: 3/3/2020 through 3/9/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	950	5.81	2.62	30.9
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



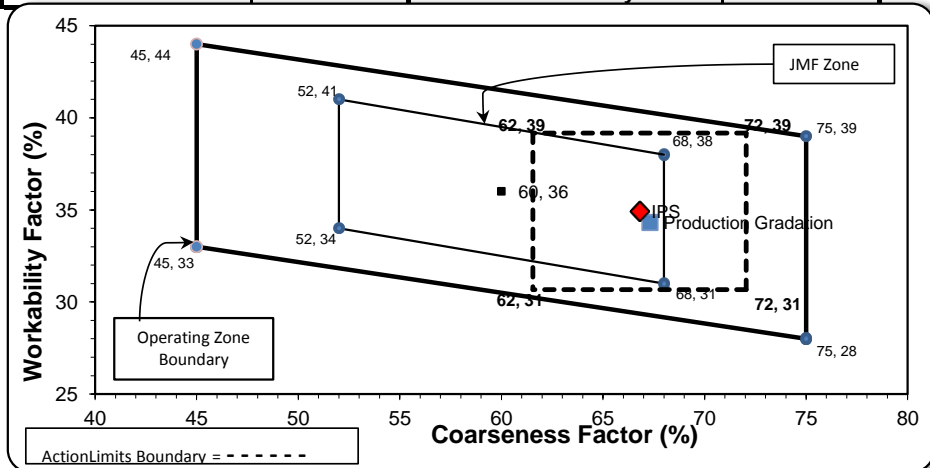
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.3	100.0	100.0	98.7	1.3	1.3
1"	33.4	100.0	100.0	81.1	17.5	18.9
3/4"	10.3	96.8	100.0	73.6	7.5	26.4
1/2"	3.5	74.0	100.0	64.6	9.0	35.4
3/8"	2.7	46.2	100.0	55.8	8.8	44.2
#4	2.2	13.2	95.5	43.6	12.2	56.4
#8	2.0	6.3	78.1	34.3	9.3	65.7
#16	2.0	4.6	62.2	27.3	7.0	72.7
#30	1.8	4.1	47.7	21.2	6.1	78.8
#50	1.8	3.8	25.6	12.1	9.1	87.9
#100	1.7	3.4	5.5	3.8	8.3	96.2
LBW	1.3	2.6	1.0	1.6	2.2	98.4

*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"	85.0	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: