

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 3/9/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/10/2020 through 3/16/2020

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%



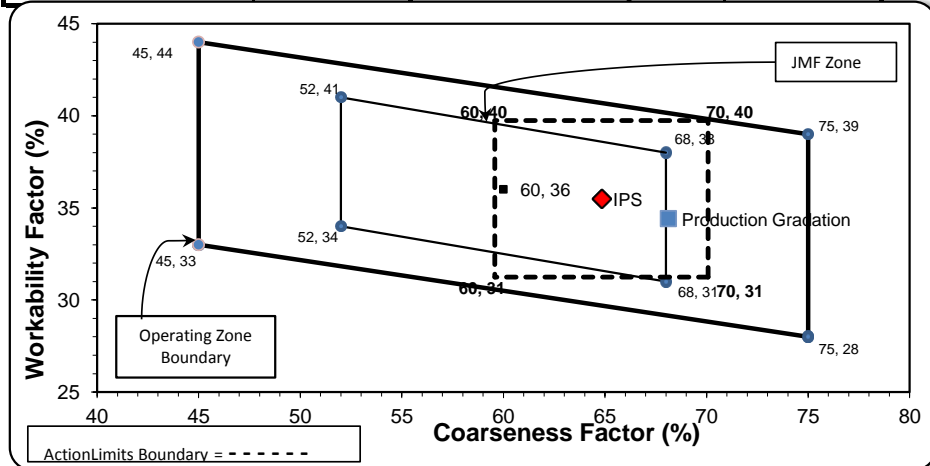
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.1	100.0	100.0	99.1	0.9	0.9
1"	43.0	100.0	100.0	83.3	15.9	16.7
3/4"	12.8	95.4	100.0	73.1	10.2	26.9
1/2"	4.6	69.4	100.0	63.1	10.0	36.9
3/8"	3.0	44.6	100.0	55.3	7.7	44.7
#4	2.3	10.3	96.1	43.4	11.9	56.6
#8	2.1	4.8	78.3	34.4	9.0	65.6
#16	2.1	3.7	62.1	27.4	7.0	72.6
#30	2.0	3.4	47.1	21.1	6.3	78.9
#50	1.9	3.1	25.0	11.8	9.3	88.2
#100	1.9	2.9	5.4	3.6	8.2	96.4
LBW	1.4	2.4	1.0	1.5	2.1	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:	68	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"	99.4	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: 3/9/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/10/2020 through 3/16/2020

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%



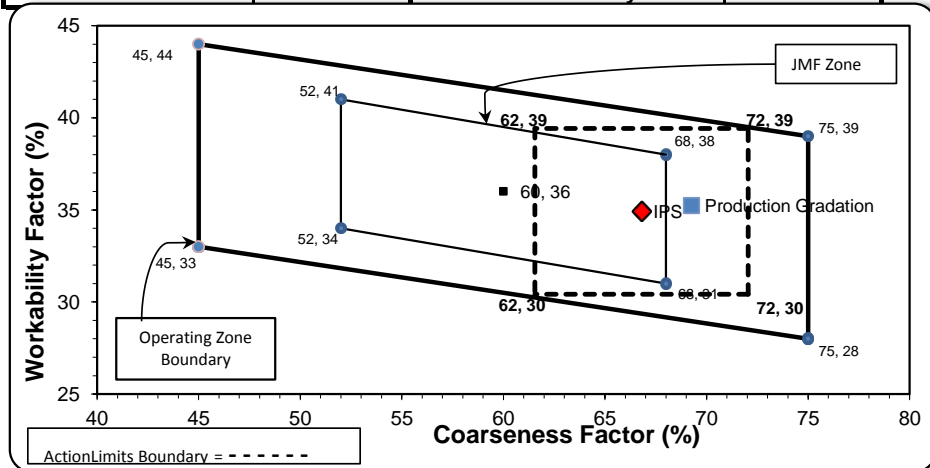
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.1	100.0	100.0	99.2	0.8	0.8
1"	43.0	100.0	100.0	84.8	14.5	15.2
3/4"	12.8	95.4	100.0	75.1	9.6	24.9
1/2"	4.6	69.4	100.0	64.1	11.1	35.9
3/8"	3.0	44.6	100.0	55.1	8.9	44.9
#4	2.3	10.3	97.3	42.2	13.0	57.8
#8	2.1	4.8	84.5	35.2	6.9	64.8
#16	2.1	3.7	69.8	29.1	6.1	70.9
#30	2.0	3.4	51.4	21.8	7.3	78.2
#50	1.9	3.1	22.7	10.4	11.3	89.6
#100	1.9	2.9	3.6	2.9	7.5	97.1
LBW	1.4	2.4	0.5	1.4	1.5	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)

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: 3/9/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/10/2020 through 3/16/2020

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%



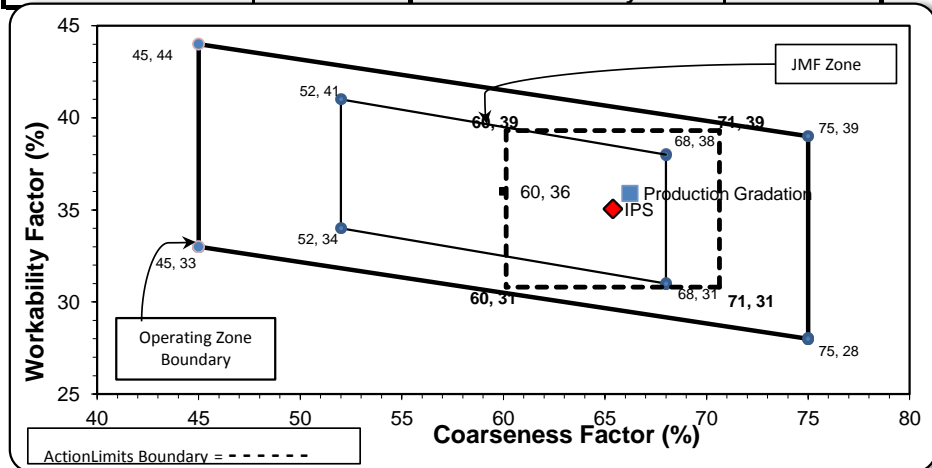
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 Suite 500
 Farmington Hills, MI 48336

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"	42.5	100.0	100.0	81.3	18.7	18.7
3/4"	12.2	98.2	100.0	70.9	10.4	29.1
1/2"	4.1	82.0	100.0	63.8	7.1	36.2
3/8"	2.8	61.0	100.0	57.5	6.2	42.5
#4	2.2	15.5	97.3	43.7	13.9	56.3
#8	2.0	6.0	84.5	35.9	7.8	64.1
#16	1.8	3.7	69.8	29.3	6.5	70.7
#30	1.7	3.1	51.4	21.8	7.5	78.2
#50	1.6	2.8	22.7	10.3	11.5	89.7
#100	1.6	2.6	3.6	2.7	7.6	97.3
LBW	1.4	2.3	0.5	1.3	1.4	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:	66	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

Contractor: _____

Sample Date: 3/9/20

Concrete Grade: P1M

Dates Test Represents: 3/10/2020 through 3/16/2020

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%



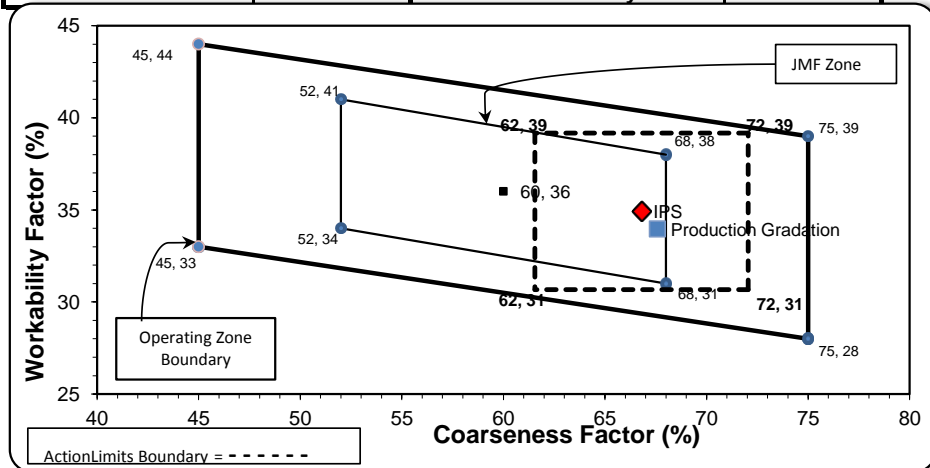
Superior Materials, LLC
 30701 W. 10 Mile Rd.
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.1	100.0	100.0	99.2	0.8	0.8
1"	43.0	100.0	100.0	83.8	15.3	16.2
3/4"	12.8	95.4	100.0	73.9	10.0	26.1
1/2"	4.6	69.4	100.0	63.5	10.4	36.5
3/8"	3.0	44.6	100.0	55.4	8.1	44.6
#4	2.3	10.3	96.1	43.0	12.4	57.0
#8	2.1	4.8	78.3	34.0	9.0	66.0
#16	2.1	3.7	62.1	27.0	6.9	73.0
#30	2.0	3.4	47.1	20.8	6.2	79.2
#50	1.9	3.1	25.0	11.7	9.1	88.3
#100	1.9	2.9	5.4	3.6	8.0	96.4
LBW	1.4	2.4	1.0	1.5	2.1	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:	68	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: