

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 1/13/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/14/2020 through 1/20/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	700	4.28	2.62	22.8
IA	71-47	Presque Isle	1170	7.16	2.62	38.1
2NS	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



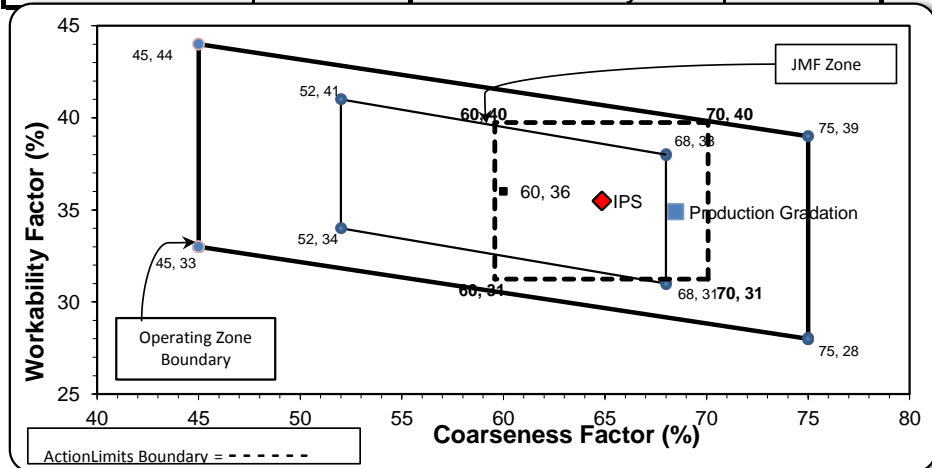
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	91.3	100.0	100.0	98.0	2.0	2.0
1"	17.3	100.0	100.0	81.1	16.9	18.9
3/4"	4.3	96.6	100.0	76.9	4.3	23.1
1/2"	2.3	69.7	100.0	66.2	10.7	33.8
3/8"	2.1	41.6	100.0	55.4	10.8	44.6
#4	1.9	9.2	95.9	41.4	14.0	58.6
#8	1.9	4.8	83.5	34.9	6.5	65.1
#16	1.8	4.0	69.3	29.0	5.9	71.0
#30	1.7	3.8	49.1	21.0	8.0	79.0
#50	1.7	3.6	24.1	11.2	9.8	88.8
#100	1.6	3.4	7.3	4.5	6.7	95.5
LBW	1.0	2.8	0.9	1.6	2.9	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: 1/13/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/14/2020 through 1/20/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	700	4.28	2.62	22.8
IA	71-47	Presque Isle	1170	7.16	2.62	38.1
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



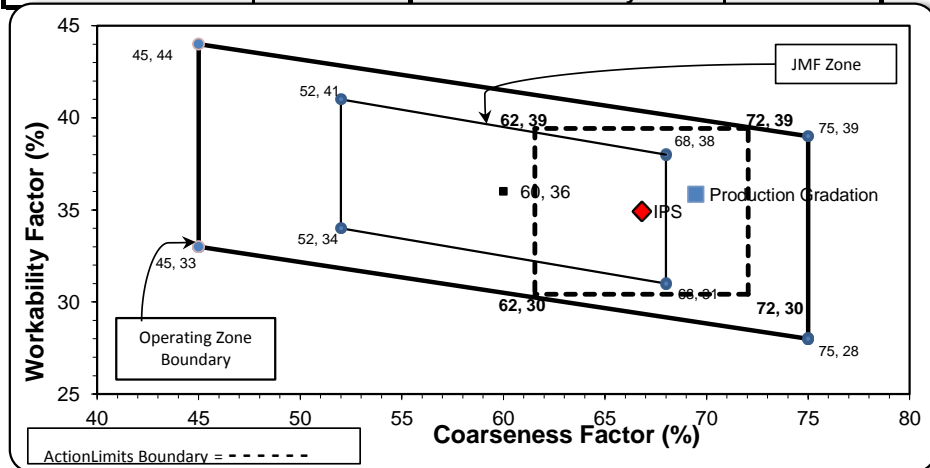
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	91.3	100.0	100.0	98.0	2.0	2.0
1"	17.3	100.0	100.0	81.1	16.9	18.9
3/4"	4.3	96.6	100.0	76.9	4.3	23.1
1/2"	2.3	69.7	100.0	66.2	10.7	33.8
3/8"	2.1	41.6	100.0	55.4	10.8	44.6
#4	1.9	9.2	97.7	42.1	13.3	57.9
#8	1.9	4.8	85.9	35.8	6.3	64.2
#16	1.8	4.0	71.0	29.7	6.2	70.3
#30	1.7	3.8	52.9	22.5	7.2	77.5
#50	1.7	3.6	22.5	10.6	12.0	89.4
#100	1.6	3.4	3.6	3.1	7.5	96.9
LBW	1.0	2.8	0.3	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:	69	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"	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: 1/13/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/14/2020 through 1/20/2020

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%



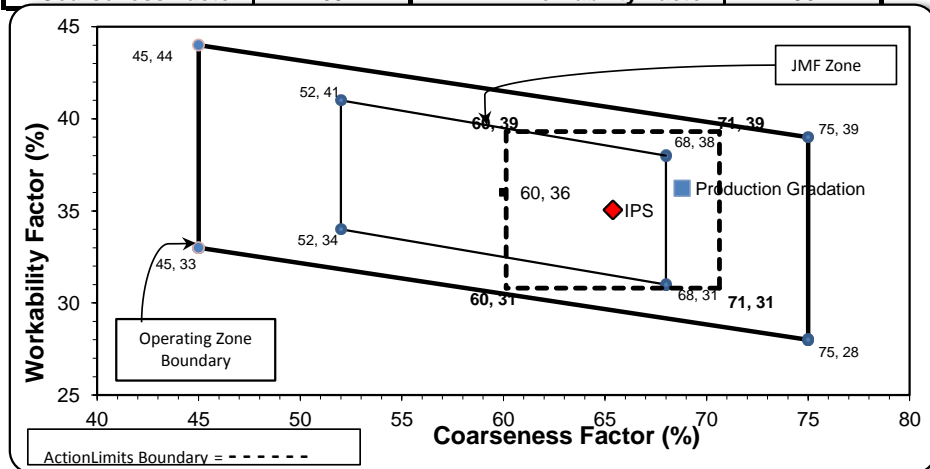
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 30701 W. 10 Mile Rd.
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.7	100.0	100.0	98.9	1.1	1.1
1"	44.2	100.0	100.0	81.8	17.1	18.2
3/4"	14.6	98.5	100.0	71.8	10.1	28.2
1/2"	3.0	81.1	100.0	63.2	8.6	36.8
3/8"	2.2	56.6	100.0	56.1	7.0	43.9
#4	2.1	16.3	97.7	44.0	12.1	56.0
#8	2.0	5.2	85.9	36.2	7.8	63.8
#16	1.9	3.1	71.0	29.7	6.5	70.3
#30	1.9	2.6	52.9	22.4	7.3	77.6
#50	1.8	2.4	22.5	10.2	12.2	89.8
#100	1.7	2.3	3.6	2.6	7.6	97.4
LBW	1.5	2.1	0.3	1.2	1.4	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:	69	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"	99.6	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: 1/13/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/14/2020 through 1/20/2020

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%



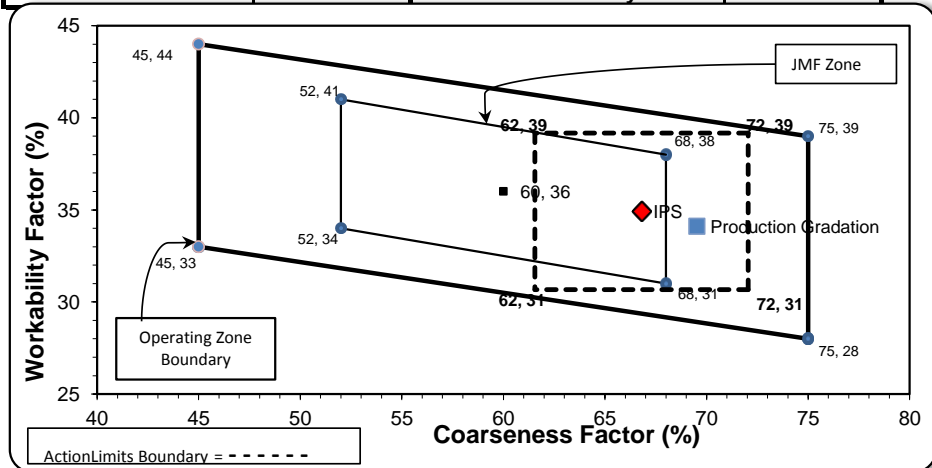
Superior Materials, LLC
 30701 W. 10 Mile Rd.
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	91.3	100.0	100.0	97.5	2.5	2.5
1"	17.3	100.0	100.0	76.6	21.0	23.4
3/4"	4.3	96.6	100.0	71.8	4.7	28.2
1/2"	2.3	69.7	100.0	62.9	8.9	37.1
3/8"	2.1	41.6	100.0	54.2	8.8	45.8
#4	1.9	9.2	96.3	42.6	11.6	57.4
#8	1.9	4.8	78.8	34.1	8.5	65.9
#16	1.8	4.0	62.9	27.4	6.7	72.6
#30	1.7	3.8	47.6	21.0	6.3	79.0
#50	1.7	3.6	25.2	11.9	9.2	88.1
#100	1.6	3.4	5.4	3.7	8.2	96.3
LBW	1.0	2.8	0.8	1.5	2.2	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:	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: