

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 3/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/24/2020 through 3/30/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	600	3.67	2.62	19.5
IA	71-47	Presque Isle	1200	7.34	2.62	39.1
2NS	63-115	Ray Rd	1270	7.68	2.65	41.4
Total Wt			3070	18.69		100.0

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



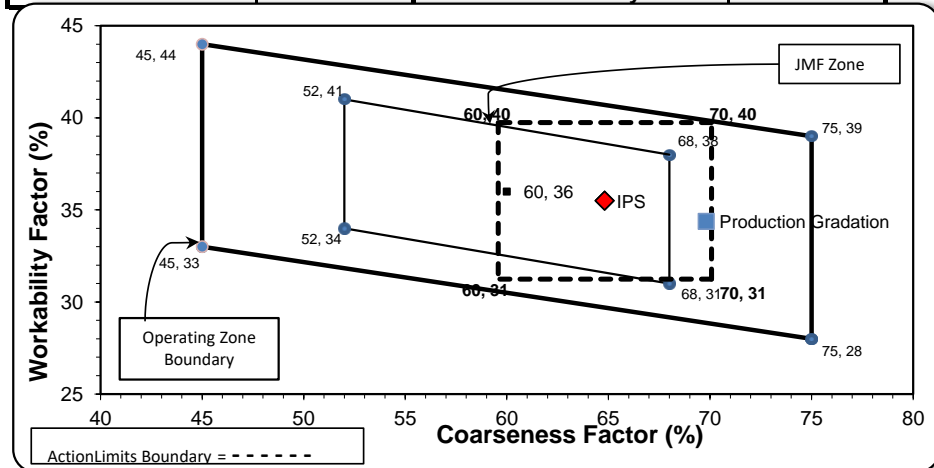
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	99.0	1.0	1.0
1"	34.6	100.0	100.0	87.2	11.8	12.8
3/4"	12.2	93.8	100.0	80.4	6.8	19.6
1/2"	6.5	59.9	100.0	66.1	14.4	33.9
3/8"	5.4	30.1	100.0	54.2	11.9	45.8
#4	3.3	5.8	96.7	42.9	11.3	57.1
#8	2.5	3.1	79.0	34.4	8.5	65.6
#16	2.4	2.5	62.1	27.1	7.2	72.9
#30	2.3	2.4	46.3	20.5	6.6	79.5
#50	2.2	2.3	23.4	11.0	9.5	89.0
#100	2.0	2.1	4.4	3.0	8.0	97.0
LBW	1.4	1.7	0.9	1.3	1.7	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:	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"	99.4	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: 3/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/24/2020 through 3/30/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	500	3.06	2.62	16.3
IA	71-47	Presque Isle	1370	8.38	2.62	44.6
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



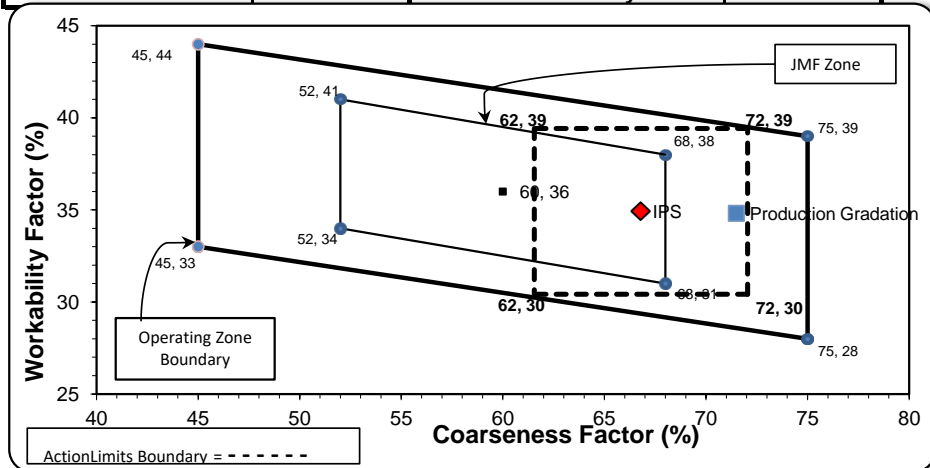
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	99.2	0.8	0.8
1"	34.6	100.0	100.0	89.3	9.8	10.7
3/4"	12.2	93.8	100.0	82.9	6.4	17.1
1/2"	6.5	59.9	100.0	66.9	16.1	33.1
3/8"	5.4	30.1	100.0	53.4	13.5	46.6
#4	3.3	5.8	97.4	41.2	12.2	58.8
#8	2.5	3.1	84.5	34.8	6.4	65.2
#16	2.4	2.5	69.4	28.6	6.2	71.4
#30	2.3	2.4	50.4	21.1	7.5	78.9
#50	2.2	2.3	21.4	9.7	11.4	90.3
#100	2.0	2.1	3.0	2.4	7.3	97.6
LBW	1.4	1.7	0.6	1.2	1.2	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:	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: 3/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/24/2020 through 3/30/2020

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%



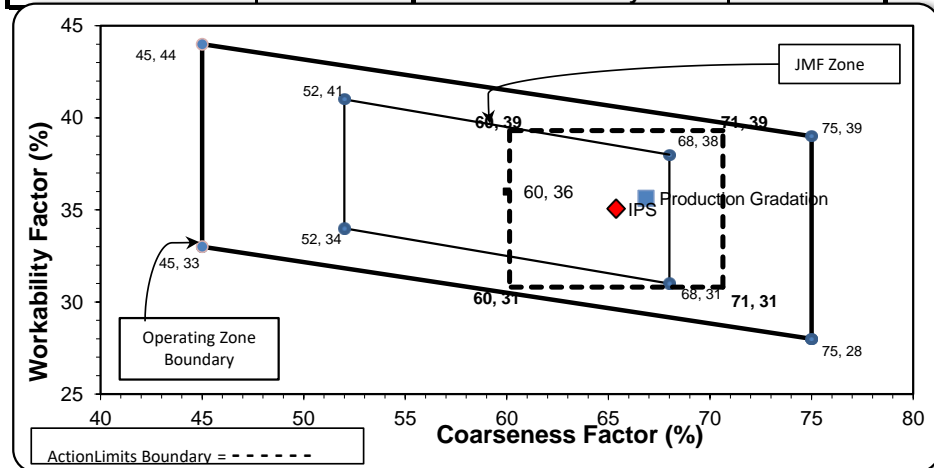
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 30701 W. 10 Mile Rd.
 Suite 500
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.7	100.0	100.0	99.3	0.7	0.7
1"	48.9	100.0	100.0	83.4	15.9	16.6
3/4"	15.1	98.4	100.0	71.9	11.5	28.1
1/2"	4.9	81.0	100.0	63.8	8.1	36.2
3/8"	3.0	58.7	100.0	57.0	6.8	43.0
#4	1.9	14.6	97.4	43.4	13.6	56.6
#8	1.7	5.4	84.5	35.6	7.7	64.4
#16	1.6	3.2	69.4	29.0	6.6	71.0
#30	1.6	2.7	50.4	21.3	7.7	78.7
#50	1.5	2.4	21.4	9.7	11.6	90.3
#100	1.4	2.3	3.0	2.3	7.4	97.7
LBW	1.2	2.0	0.6	1.2	1.1	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:	67	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**

Sample Date: 3/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/24/2020 through 3/30/2020

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	1120	6.85	2.62	36.5
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



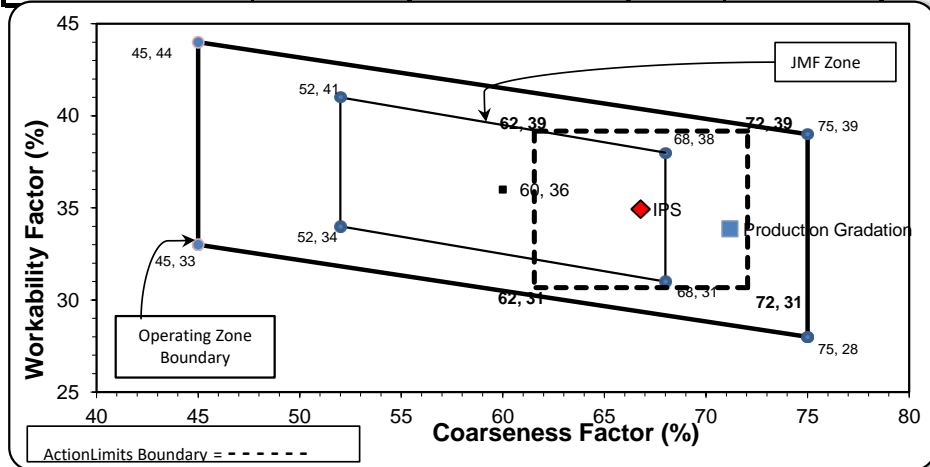
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.0	100.0	100.0	98.9	1.1	1.1
1"	34.6	100.0	100.0	85.1	13.8	14.9
3/4"	12.2	93.8	100.0	77.7	7.4	22.3
1/2"	6.5	59.9	100.0	64.1	13.7	35.9
3/8"	5.4	30.1	100.0	52.9	11.1	47.1
#4	3.3	5.8	96.7	42.2	10.7	57.8
#8	2.5	3.1	79.0	33.9	8.4	66.1
#16	2.4	2.5	62.1	26.7	7.1	73.3
#30	2.3	2.4	46.3	20.3	6.5	79.7
#50	2.2	2.3	23.4	10.9	9.4	89.1
#100	2.0	2.1	4.4	3.0	7.9	97.0
LBW	1.4	1.7	0.9	1.3	1.7	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:	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: