

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 11/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 11/24/2020 through 11/30/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	900	5.50	2.62	29.3
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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	43.7	100.0	100.0	82.2	17.8	17.8
3/4"	10.3	99.5	100.0	71.5	10.7	28.5
1/2"	2.3	89.3	100.0	66.0	5.5	34.0
3/8"	2.0	66.6	100.0	59.2	6.7	40.8
#4	1.8	20.6	98.5	45.1	14.1	54.9
#8	1.6	6.3	84.0	35.2	9.9	64.8
#16	1.6	3.4	68.6	28.3	6.9	71.7
#30	1.6	2.9	51.7	21.6	6.7	78.4
#50	1.5	2.7	24.8	11.0	10.6	89.0
#100	1.4	2.5	4.0	2.7	8.2	97.3
LBW	1.3	2.3	0.5	1.3	1.5	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

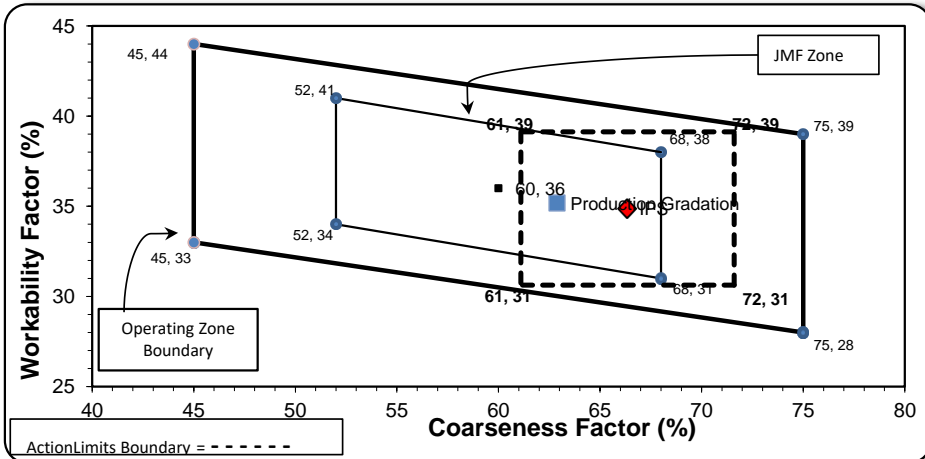
Coarseness Factor:	63	Workability Factor:	35
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Initial Production Sample (IPS)

Coarseness Factor:	66
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Workability Factor:	35
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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-32**

Sample Date: 11/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 11/24/2020 through 11/30/2020

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	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



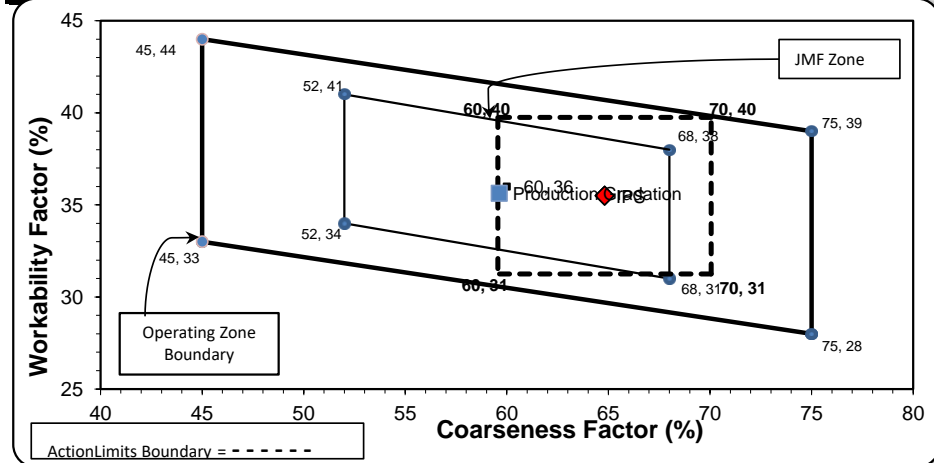
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.7	100.0	100.0	99.0	1.0	1.0
1"	41.1	100.0	100.0	82.3	16.7	17.7
3/4"	20.9	99.0	100.0	76.0	6.3	24.0
1/2"	5.7	89.1	100.0	68.5	7.5	31.5
3/8"	3.7	67.5	100.0	61.6	6.9	38.4
#4	2.9	23.0	95.2	46.4	15.2	53.6
#8	2.3	6.4	81.2	35.6	10.7	64.4
#16	2.3	3.0	64.8	28.0	7.7	72.0
#30	2.2	2.7	42.8	18.9	9.1	81.1
#50	2.2	2.4	22.8	10.6	8.2	89.4
#100	2.0	2.2	9.7	5.2	5.5	94.8
LBW	1.6	1.4	1.2	1.4	3.8	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:	60	Workability Factor:	36
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Initial Production Sample (IPS)

Coarseness Factor:	65		
Workability Factor:	36		
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

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 11/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 11/24/2020 through 11/30/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



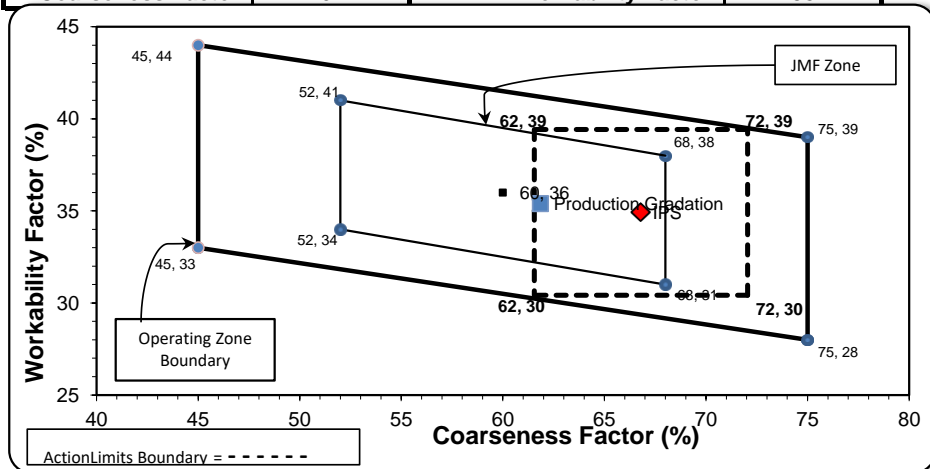
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.7	100.0	100.0	99.0	1.0	1.0
1"	41.1	100.0	100.0	81.4	17.6	18.6
3/4"	20.9	99.0	100.0	74.7	6.7	25.3
1/2"	5.7	89.1	100.0	67.0	7.7	33.0
3/8"	3.7	67.5	100.0	60.0	7.0	40.0
#4	2.9	23.0	97.0	45.6	14.5	54.4
#8	2.3	6.4	83.9	35.4	10.2	64.6
#16	2.3	3.0	69.3	28.7	6.7	71.3
#30	2.2	2.7	50.6	21.3	7.4	78.7
#50	2.2	2.4	20.2	9.3	12.0	90.7
#100	2.0	2.2	2.3	2.2	7.1	97.8
LBW	1.6	1.4	0.1	1.0	1.2	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:	62	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

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Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 11/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 11/24/2020 through 11/30/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	900	5.50	2.62	29.3
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%



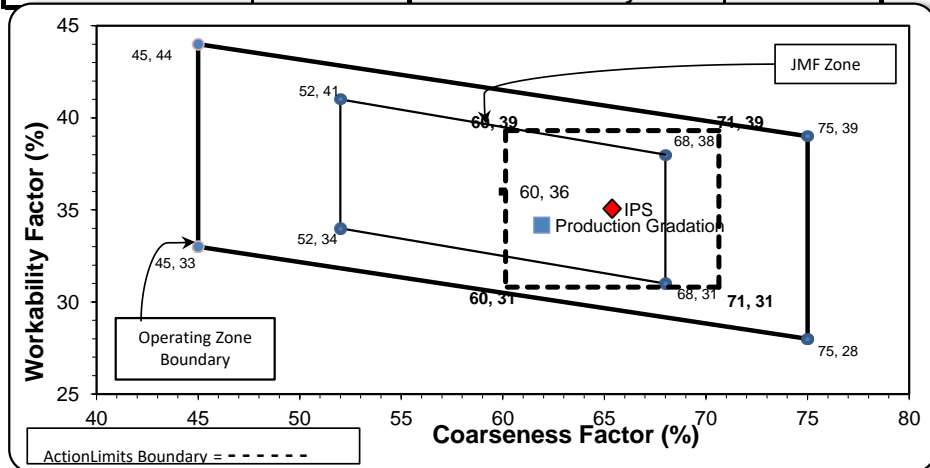
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	43.7	100.0	100.0	82.2	17.8	17.8
3/4"	10.3	99.5	100.0	71.5	10.7	28.5
1/2"	2.3	89.3	100.0	66.0	5.5	34.0
3/8"	2.0	66.6	100.0	59.2	6.7	40.8
#4	1.8	20.6	96.2	44.2	15.0	55.8
#8	1.6	6.3	81.4	34.2	10.0	65.8
#16	1.6	3.4	65.9	27.3	6.9	72.7
#30	1.6	2.9	50.4	21.1	6.2	78.9
#50	1.5	2.7	24.4	10.8	10.3	89.2
#100	1.4	2.5	5.4	3.3	7.5	96.7
LBW	1.3	2.3	0.6	1.3	2.0	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:	62	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-02**

Sample Date: 11/23/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 11/24/2020 through 11/30/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



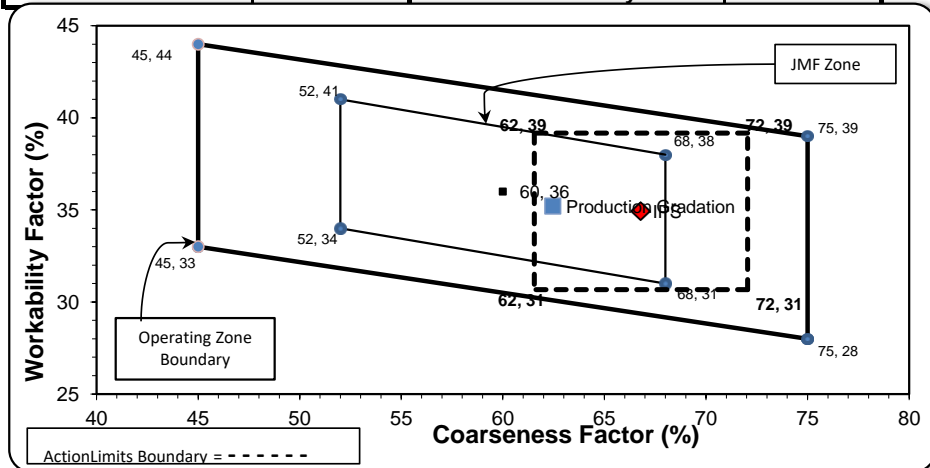
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 30701 W. 10 Mile Rd.
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.7	100.0	100.0	98.9	1.1	1.1
1"	41.1	100.0	100.0	80.4	18.5	19.6
3/4"	20.9	99.0	100.0	73.5	7.0	26.5
1/2"	5.7	89.1	100.0	65.8	7.6	34.2
3/8"	3.7	67.5	100.0	59.5	6.3	40.5
#4	2.9	23.0	98.1	46.9	12.6	53.1
#8	2.3	6.4	80.5	35.2	11.7	64.8
#16	2.3	3.0	63.1	27.2	8.0	72.8
#30	2.2	2.7	46.8	20.5	6.7	79.5
#50	2.2	2.4	21.8	10.2	10.3	89.8
#100	2.0	2.2	3.8	2.8	7.4	97.2
LBW	1.6	1.4	0.6	1.1	1.6	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:	62	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"	72.3	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: