

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 2/1/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/2/2021 through 2/8/2021

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"	96.8	100.0	100.0	99.0	1.0	1.0
1"	45.6	100.0	100.0	82.8	16.2	17.2
3/4"	14.7	98.7	100.0	72.7	10.1	27.3
1/2"	3.6	81.6	100.0	64.1	8.5	35.9
3/8"	2.9	55.3	100.0	56.2	7.9	43.8
#4	2.3	9.9	98.3	42.1	14.2	57.9
#8	2.1	3.7	83.7	34.5	7.6	65.5
#16	2.0	2.6	68.8	28.3	6.2	71.7
#30	1.9	2.3	51.3	21.3	7.0	78.7
#50	1.9	2.2	24.7	10.9	10.4	89.1
#100	1.7	2.1	3.9	2.7	8.2	97.3
LBW	1.5	1.9	0.5	1.2	1.5	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.

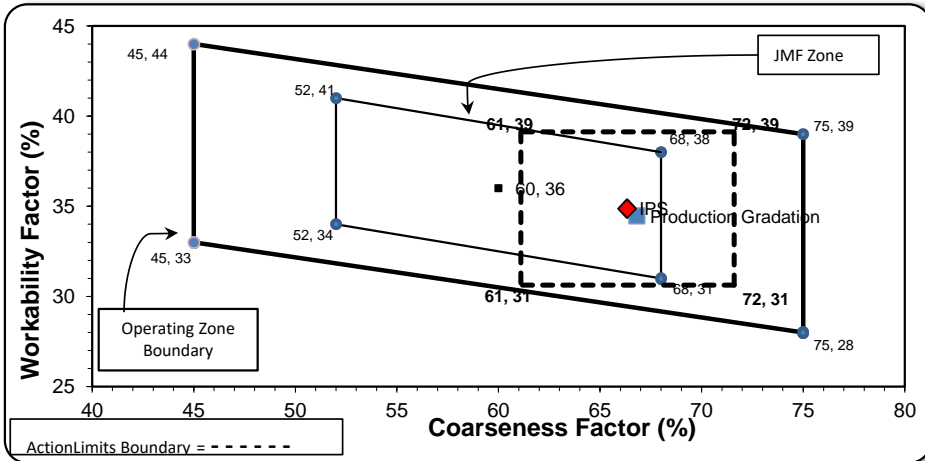
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	67	Workability Factor:	34
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Initial Production Sample (IPS)

Coarseness Factor:	66
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"	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: 2/1/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/2/2021 through 2/8/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	750	4.59	2.62	24.4
IA	71-47	Presque Isle	1070	6.54	2.62	34.9
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



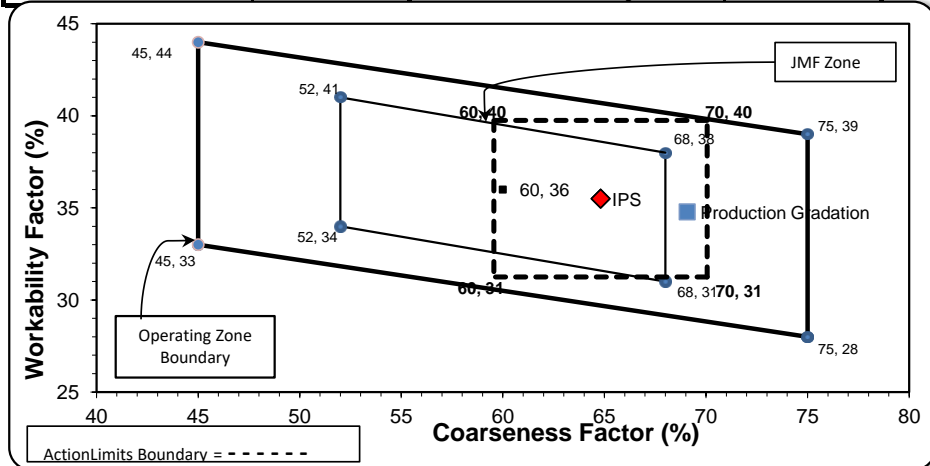
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 Suite 500
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.7	100.0	100.0	98.9	1.1	1.1
1"	35.2	100.0	100.0	84.2	14.8	15.8
3/4"	9.3	96.9	100.0	76.8	7.4	23.2
1/2"	2.7	71.5	100.0	66.3	10.5	33.7
3/8"	2.2	39.3	100.0	55.0	11.3	45.0
#4	1.9	4.8	95.1	40.9	14.1	59.1
#8	1.8	2.5	82.2	34.8	6.1	65.2
#16	1.7	2.3	66.9	28.5	6.3	71.5
#30	1.6	2.2	42.6	18.5	10.0	81.5
#50	1.5	2.0	18.5	8.6	9.9	91.4
#100	1.4	1.9	4.6	2.9	5.7	97.1
LBW	1.1	1.2	1.2	1.2	1.7	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:	35
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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

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 2/1/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/2/2021 through 2/8/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



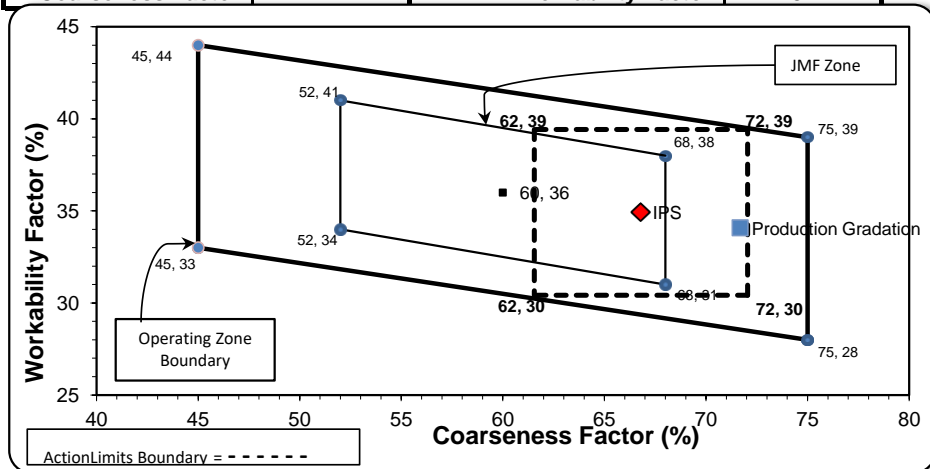
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.7	100.0	100.0	98.8	1.2	1.2
1"	35.2	100.0	100.0	82.1	16.8	17.9
3/4"	9.3	96.9	100.0	73.9	8.2	26.1
1/2"	2.7	71.5	100.0	63.6	10.3	36.4
3/8"	2.2	39.3	100.0	52.8	10.8	47.2
#4	1.9	4.8	97.3	40.2	12.6	59.8
#8	1.8	2.5	83.8	34.1	6.1	65.9
#16	1.7	2.3	68.4	28.0	6.1	72.0
#30	1.6	2.2	49.4	20.5	7.5	79.5
#50	1.5	2.0	22.2	9.8	10.7	90.2
#100	1.4	1.9	3.9	2.5	7.2	97.5
LBW	1.1	1.2	0.4	0.9	1.7	99.1

*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:	72	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"	72.1	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: 2/1/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/2/2021 through 2/8/2021

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%



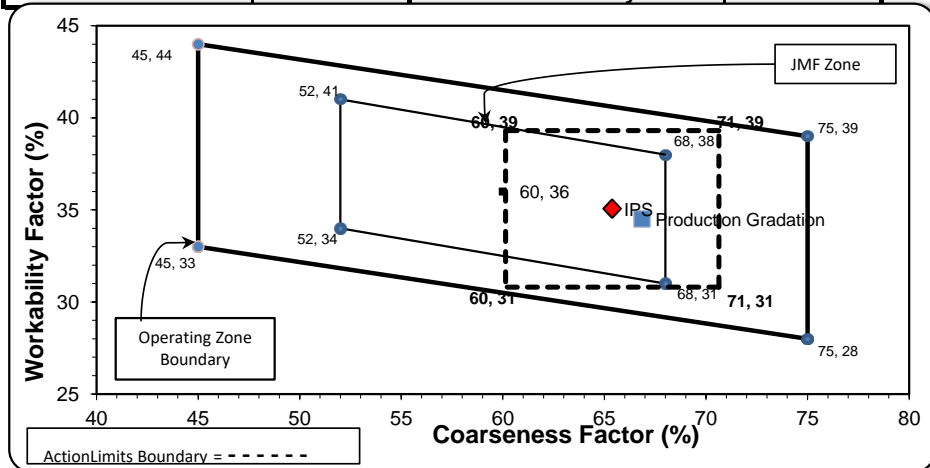
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.8	100.0	100.0	99.0	1.0	1.0
1"	45.6	100.0	100.0	82.8	16.2	17.2
3/4"	14.7	98.7	100.0	72.7	10.1	27.3
1/2"	3.6	81.6	100.0	64.1	8.5	35.9
3/8"	2.9	55.3	100.0	56.2	7.9	43.8
#4	2.3	9.9	97.3	41.7	14.6	58.3
#8	2.1	3.7	83.8	34.5	7.2	65.5
#16	2.0	2.6	68.4	28.1	6.4	71.9
#30	1.9	2.3	49.4	20.6	7.5	79.4
#50	1.9	2.2	22.2	9.9	10.7	90.1
#100	1.7	2.1	3.9	2.7	7.2	97.3
LBW	1.5	1.9	0.4	1.2	1.5	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:	35
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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: 2/1/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/2/2021 through 2/8/2021

MDOT No.: _____

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

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



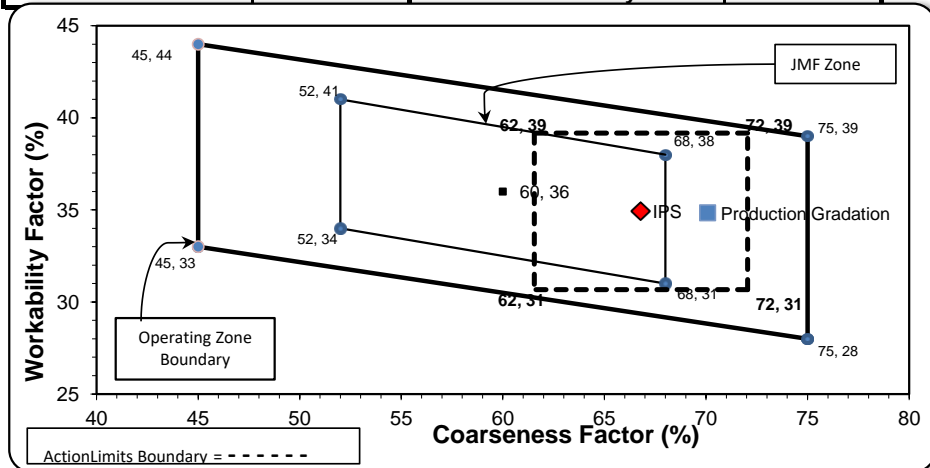
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 30701 W. 10 Mile Rd.
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.7	100.0	100.0	98.9	1.1	1.1
1"	35.2	100.0	100.0	83.1	15.8	16.9
3/4"	9.3	96.9	100.0	75.3	7.8	24.7
1/2"	2.7	71.5	100.0	65.2	10.2	34.8
3/8"	2.2	39.3	100.0	54.3	10.8	45.7
#4	1.9	4.8	97.4	41.7	12.6	58.3
#8	1.8	2.5	82.4	34.9	6.9	65.1
#16	1.7	2.3	66.8	28.4	6.4	71.6
#30	1.6	2.2	50.2	21.6	6.8	78.4
#50	1.5	2.0	22.4	10.2	11.4	89.8
#100	1.4	1.9	3.4	2.4	7.8	97.6
LBW	1.1	1.2	0.5	0.9	1.5	99.1

*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:	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: