

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 2/8/21 Concrete Grade: **P1M**
 Dates Test Represents: 2/9/2021 through 2/15/2021

Contractor: _____

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"	98.4	100.0	100.0	99.5	0.5	0.5
1"	45.8	100.0	100.0	82.9	16.6	17.1
3/4"	14.9	98.1	100.0	72.6	10.3	27.4
1/2"	2.8	77.4	100.0	62.7	9.9	37.3
3/8"	2.1	53.1	100.0	55.3	7.3	44.7
#4	1.8	9.6	98.3	41.8	13.5	58.2
#8	1.7	3.5	83.6	34.2	7.6	65.8
#16	1.6	2.5	68.5	28.0	6.2	72.0
#30	1.6	2.3	50.8	21.0	7.0	79.0
#50	1.5	2.2	23.8	10.4	10.6	89.6
#100	1.4	2.1	3.6	2.5	8.0	97.5
LBW	1.2	1.9	0.4	1.1	1.4	98.9

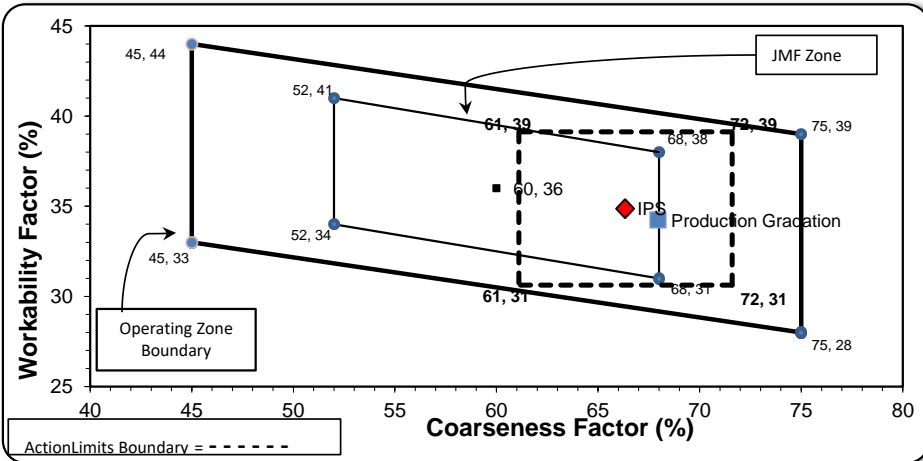
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	68	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: 2/8/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/9/2021 through 2/15/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	780	4.77	2.62	25.4
IA	71-47	Presque Isle	1040	6.36	2.62	33.9
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



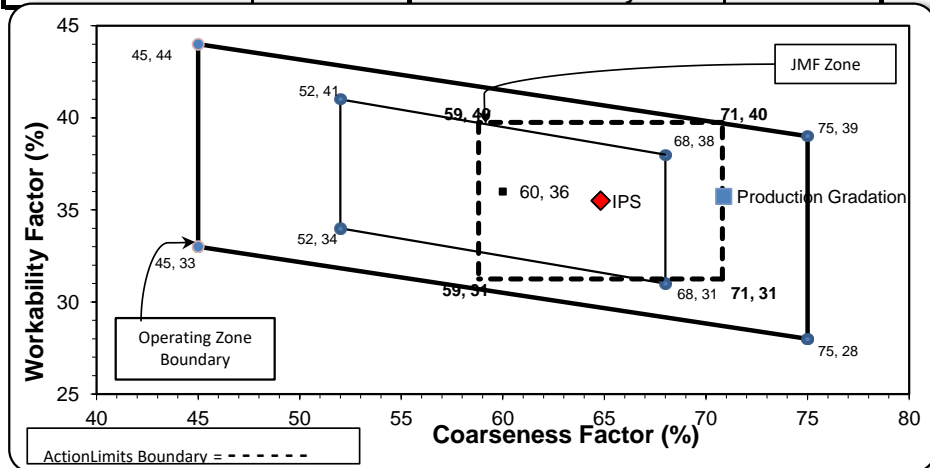
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.0	100.0	100.0	99.2	0.8	0.8
1"	44.2	100.0	100.0	85.8	13.4	14.2
3/4"	14.1	96.9	100.0	77.1	8.7	22.9
1/2"	4.3	71.5	100.0	66.0	11.1	34.0
3/8"	1.7	39.3	100.0	54.5	11.6	45.5
#4	1.6	4.8	96.7	41.4	13.1	58.6
#8	1.6	2.5	84.7	35.7	5.7	64.3
#16	1.5	2.3	71.2	30.2	5.6	69.8
#30	1.5	2.2	50.1	21.5	8.6	78.5
#50	1.4	2.0	19.0	8.8	12.8	91.2
#100	1.3	1.9	4.5	2.8	6.0	97.2
LBW	0.9	1.2	1.3	1.2	1.6	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:	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: 2/8/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/9/2021 through 2/15/2021

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%



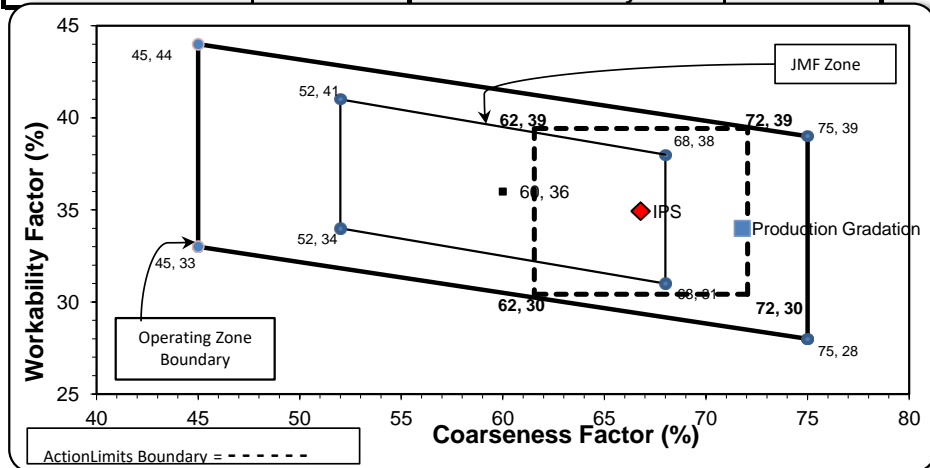
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.0	100.0	100.0	99.2	0.8	0.8
1"	44.2	100.0	100.0	84.6	14.6	15.4
3/4"	14.1	96.9	100.0	75.2	9.4	24.8
1/2"	4.3	71.5	100.0	64.0	11.2	36.0
3/8"	1.7	39.3	100.0	52.6	11.4	47.4
#4	1.6	4.8	96.7	39.8	12.8	60.2
#8	1.6	2.5	83.7	34.0	5.8	66.0
#16	1.5	2.3	68.3	27.9	6.1	72.1
#30	1.5	2.2	48.8	20.2	7.7	79.8
#50	1.4	2.0	21.2	9.3	10.9	90.7
#100	1.3	1.9	3.2	2.2	7.1	97.8
LBW	0.9	1.2	0.5	0.8	1.4	99.2

*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**



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: 2/8/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/9/2021 through 2/15/2021

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%



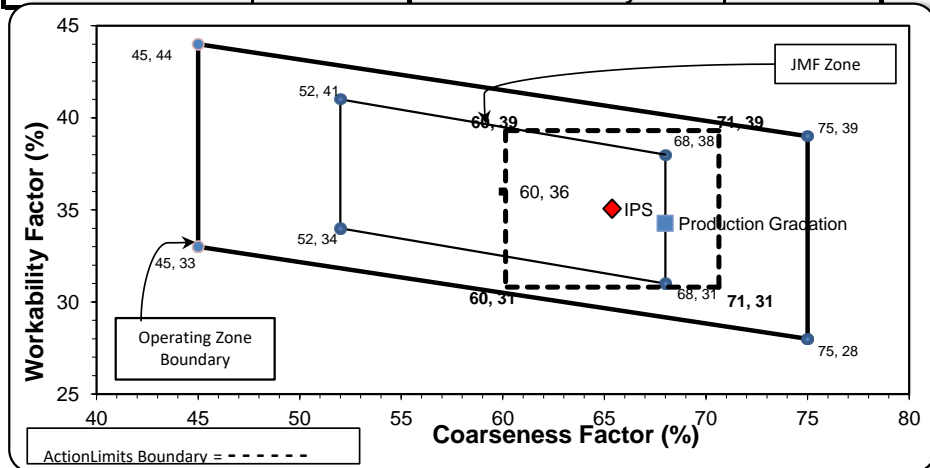
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.5	0.5	0.5
1"	45.8	100.0	100.0	82.9	16.6	17.1
3/4"	14.9	98.1	100.0	72.6	10.3	27.4
1/2"	2.8	77.4	100.0	62.7	9.9	37.3
3/8"	2.1	53.1	100.0	55.3	7.3	44.7
#4	1.8	9.6	96.7	41.2	14.1	58.8
#8	1.7	3.5	83.7	34.3	6.9	65.7
#16	1.6	2.5	68.3	27.9	6.3	72.1
#30	1.6	2.3	48.8	20.3	7.7	79.7
#50	1.5	2.2	21.2	9.4	10.8	90.6
#100	1.4	2.1	3.2	2.3	7.1	97.7
LBW	1.2	1.9	0.5	1.1	1.2	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:	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"	99.6	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:
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Aggregate Optimization Chart

PLANT #: **P-02**

Sample Date: 2/8/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 2/9/2021 through 2/15/2021

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%



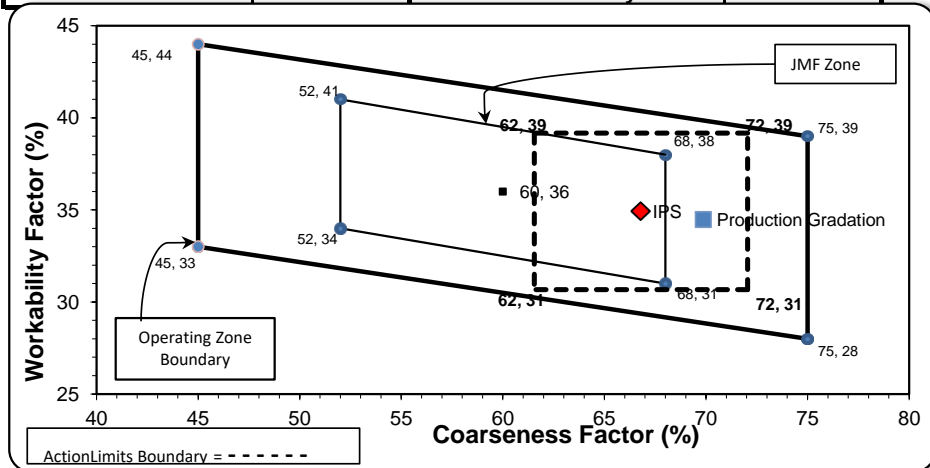
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 30701 W. 10 Mile Rd.
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.0	100.0	100.0	99.2	0.8	0.8
1"	44.2	100.0	100.0	85.5	13.8	14.5
3/4"	14.1	96.9	100.0	76.6	8.9	23.4
1/2"	4.3	71.5	100.0	65.6	11.0	34.4
3/8"	1.7	39.3	100.0	54.2	11.4	45.8
#4	1.6	4.8	97.1	41.5	12.7	58.5
#8	1.6	2.5	81.6	34.5	7.1	65.5
#16	1.5	2.3	66.4	28.2	6.3	71.8
#30	1.5	2.2	50.0	21.5	6.7	78.5
#50	1.4	2.0	23.1	10.4	11.0	89.6
#100	1.3	1.9	3.6	2.4	8.0	97.6
LBW	0.9	1.2	0.6	0.9	1.6	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:	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: