

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 1/25/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/26/2021 through 2/1/2021

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"	98.9	100.0	100.0	99.7	0.3	0.3
1"	43.9	100.0	100.0	82.3	17.4	17.7
3/4"	13.7	99.6	100.0	72.6	9.7	27.4
1/2"	3.3	87.6	100.0	65.8	6.8	34.2
3/8"	2.4	64.4	100.0	58.7	7.1	41.3
#4	1.9	12.0	98.0	42.4	16.3	57.6
#8	1.7	3.3	81.1	33.2	9.2	66.8
#16	1.6	2.4	64.8	26.5	6.7	73.5
#30	1.5	2.2	46.2	19.2	7.4	80.8
#50	1.5	2.1	21.0	9.3	9.9	90.7
#100	1.4	2.0	3.2	2.3	7.0	97.7
LBW	1.2	1.9	0.4	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.

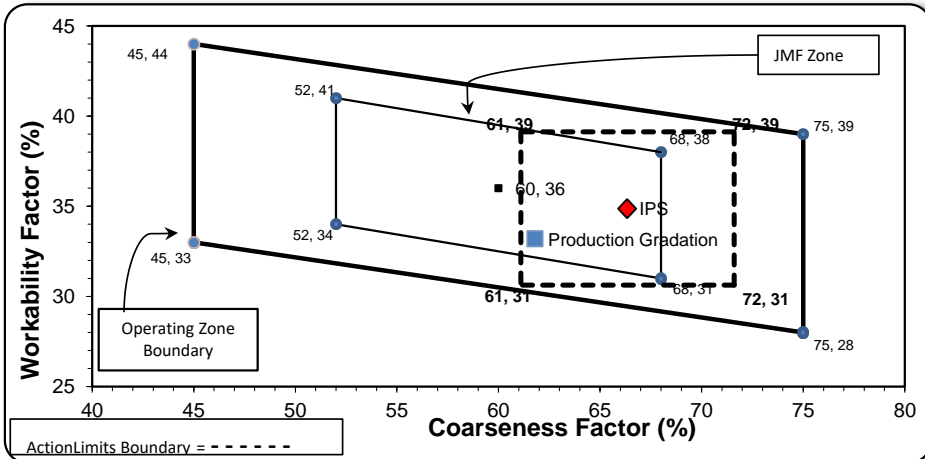
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	62	Workability Factor:	33
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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: 1/25/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/26/2021 through 2/1/2021

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	820	5.02	2.62	26.7
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



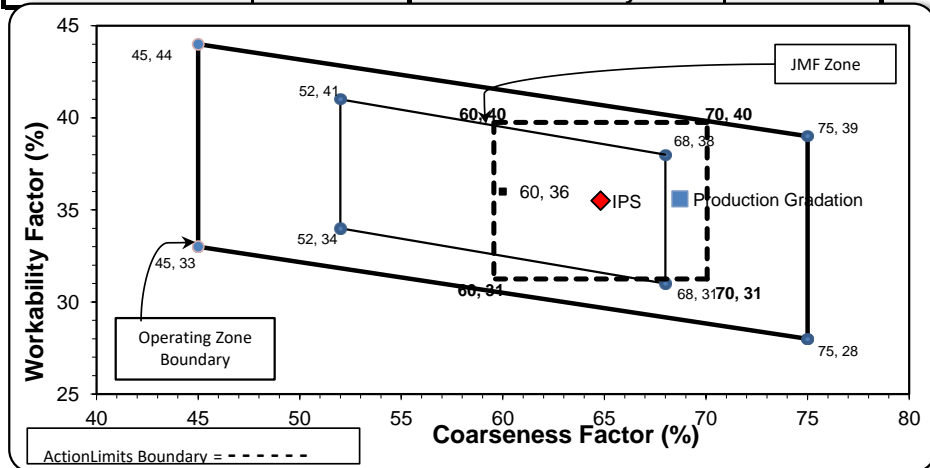
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.8	100.0	100.0	98.6	1.4	1.4
1"	35.1	100.0	100.0	78.9	19.8	21.1
3/4"	12.9	97.5	100.0	71.0	7.9	29.0
1/2"	4.4	74.0	100.0	61.9	9.0	38.1
3/8"	3.1	52.5	100.0	55.7	6.2	44.3
#4	2.2	11.4	96.6	43.1	12.7	56.9
#8	2.1	4.5	82.8	35.6	7.5	64.4
#16	2.0	3.3	66.7	28.7	6.9	71.3
#30	1.9	3.0	43.3	19.1	9.6	80.9
#50	1.8	2.9	18.0	8.7	10.4	91.3
#100	1.7	2.7	4.4	3.1	5.6	96.9
LBW	1.3	2.2	1.1	1.5	1.6	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:	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"	99.0	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: 1/25/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/26/2021 through 2/1/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



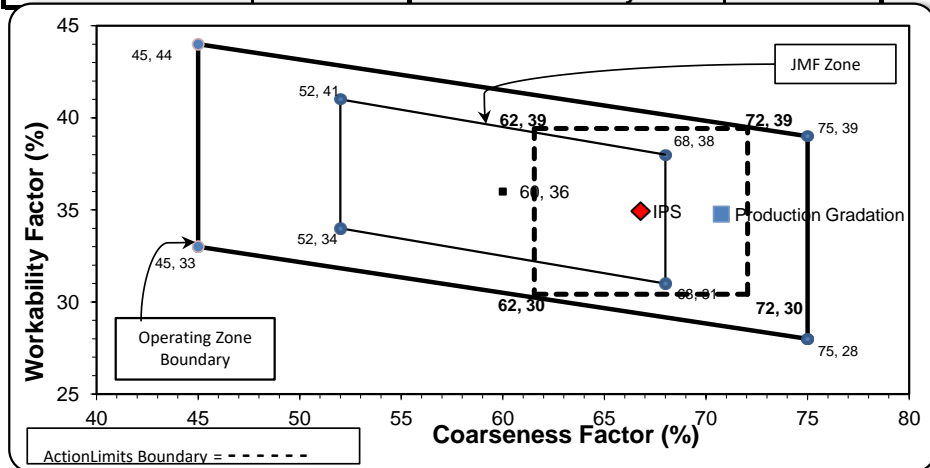
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.8	100.0	100.0	98.5	1.5	1.5
1"	35.1	100.0	100.0	77.4	21.2	22.6
3/4"	12.9	97.5	100.0	69.0	8.4	31.0
1/2"	4.4	74.0	100.0	59.9	9.1	40.1
3/8"	3.1	52.5	100.0	53.8	6.1	46.2
#4	2.2	11.4	97.3	41.8	12.1	58.2
#8	2.1	4.5	84.1	34.8	7.0	65.2
#16	2.0	3.3	69.2	28.6	6.2	71.4
#30	1.9	3.0	48.6	20.4	8.2	79.6
#50	1.8	2.9	19.5	9.0	11.4	91.0
#100	1.7	2.7	2.4	2.2	6.8	97.8
LBW	1.3	2.2	0.4	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:	71	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: 1/25/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/26/2021 through 2/1/2021

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%



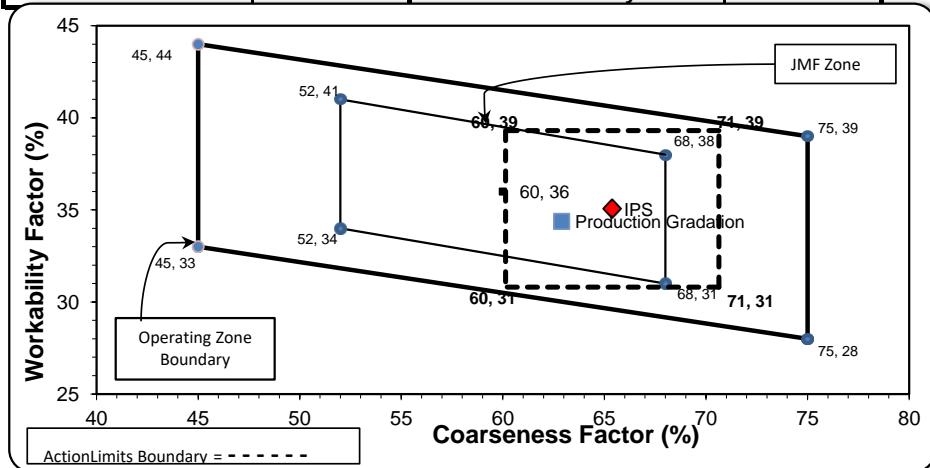
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.9	100.0	100.0	99.7	0.3	0.3
1"	43.9	100.0	100.0	82.3	17.4	17.7
3/4"	13.7	99.6	100.0	72.6	9.7	27.4
1/2"	3.3	87.6	100.0	65.8	6.8	34.2
3/8"	2.4	64.4	100.0	58.7	7.1	41.3
#4	1.9	12.0	97.3	42.2	16.6	57.8
#8	1.7	3.3	84.1	34.4	7.8	65.6
#16	1.6	2.4	69.2	28.3	6.1	71.7
#30	1.5	2.2	48.6	20.1	8.1	79.9
#50	1.5	2.1	19.5	8.7	11.4	91.3
#100	1.4	2.0	2.4	2.0	6.7	98.0
LBW	1.2	1.9	0.4	1.1	0.9	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: **63** **Workability Factor:** **34**



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: 1/25/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 1/26/2021 through 2/1/2021

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	820	5.02	2.62	26.7
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



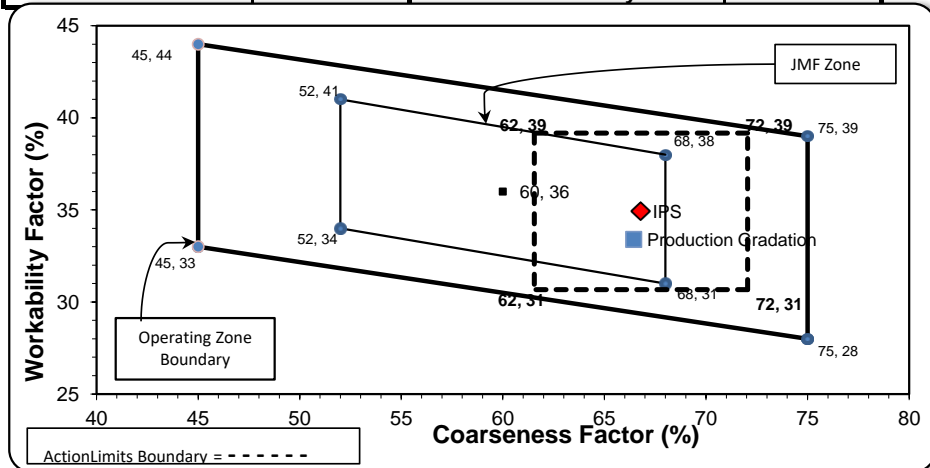
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 30701 W. 10 Mile Rd.
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.8	100.0	100.0	98.6	1.4	1.4
1"	35.1	100.0	100.0	78.9	19.8	21.1
3/4"	12.9	97.5	100.0	71.0	7.9	29.0
1/2"	4.4	74.0	100.0	61.9	9.0	38.1
3/8"	3.1	52.5	100.0	55.7	6.2	44.3
#4	2.2	11.4	96.4	43.0	12.7	57.0
#8	2.1	4.5	77.4	33.4	9.6	66.6
#16	2.0	3.3	60.8	26.3	7.1	73.7
#30	1.9	3.0	45.3	19.9	6.4	80.1
#50	1.8	2.9	21.0	9.9	10.0	90.1
#100	1.7	2.7	3.4	2.7	7.3	97.3
LBW	1.3	2.2	0.3	1.1	1.5	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:	66	Workability Factor:	33
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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: