

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 12/21/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/22/2020 through 12/28/2020

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"	97.8	100.0	100.0	99.3	0.7	0.7
1"	46.6	100.0	100.0	83.1	16.2	16.9
3/4"	10.2	98.2	100.0	71.1	12.0	28.9
1/2"	2.3	78.9	100.0	62.9	8.2	37.1
3/8"	1.9	55.1	100.0	55.8	7.1	44.2
#4	1.7	13.8	98.6	43.1	12.7	56.9
#8	1.6	4.5	84.0	34.7	8.5	65.3
#16	1.6	2.7	68.1	27.9	6.7	72.1
#30	1.5	2.3	50.0	20.7	7.2	79.3
#50	1.5	2.2	23.4	10.3	10.4	89.7
#100	1.4	2.1	3.9	2.6	7.7	97.4
LBW	1.2	1.9	0.6	1.2	1.4	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.

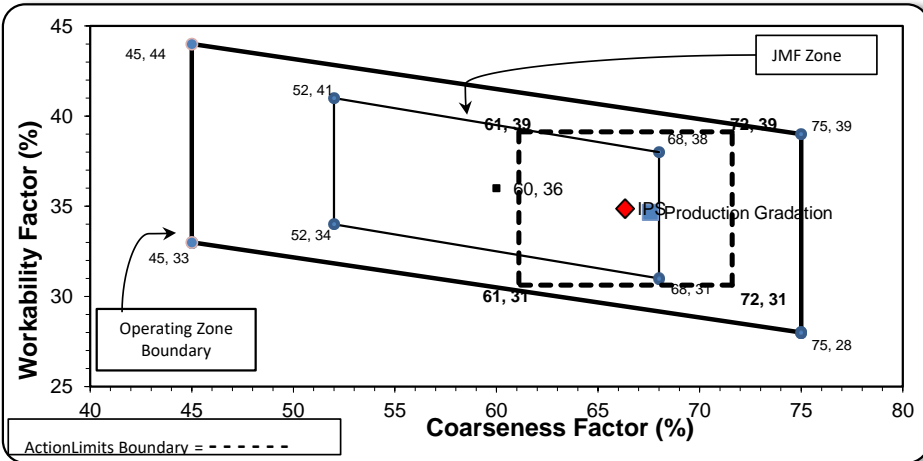
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	68	Workability Factor:	35
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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: 12/21/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/22/2020 through 12/28/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	820	5.02	2.62	26.7
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



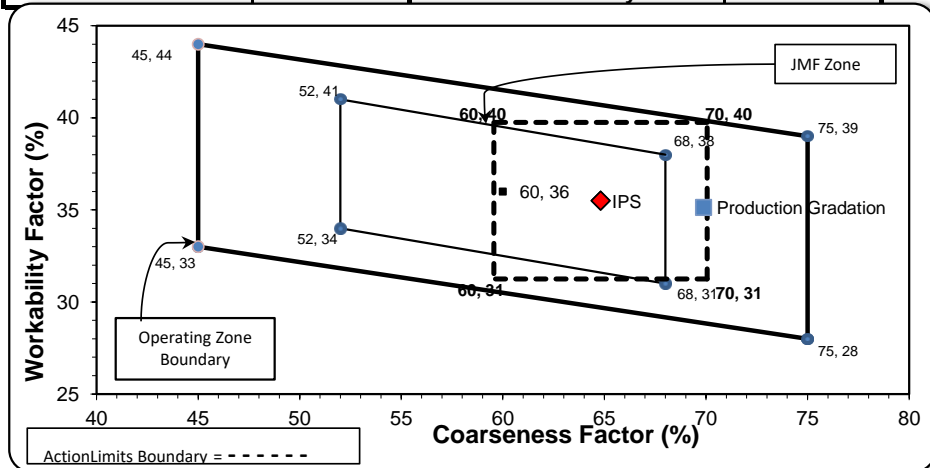
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.5	0.5	0.5
1"	54.9	100.0	100.0	88.0	11.6	12.0
3/4"	23.5	96.9	100.0	78.6	9.4	21.4
1/2"	6.0	73.8	100.0	66.4	12.2	33.6
3/8"	3.1	40.3	100.0	54.7	11.7	45.3
#4	2.5	8.8	95.8	42.5	12.1	57.5
#8	2.1	3.0	82.5	35.1	7.4	64.9
#16	1.9	2.2	66.2	28.2	7.0	71.8
#30	1.9	2.0	45.8	19.8	8.4	80.2
#50	1.7	2.0	27.6	12.3	7.5	87.7
#100	1.5	1.8	8.4	4.4	7.9	95.6
LBW	1.2	1.4	1.1	1.2	3.2	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:	70	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-39**

Sample Date: 12/21/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/22/2020 through 12/28/2020

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%



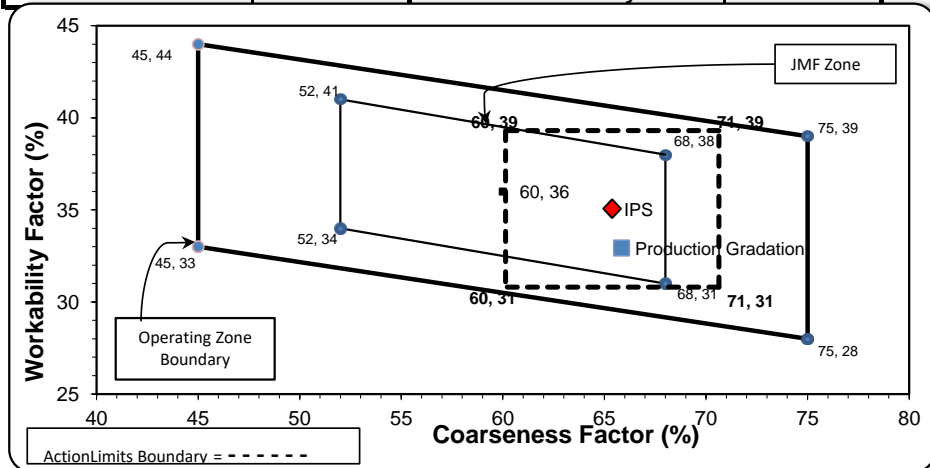
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.8	100.0	100.0	99.3	0.7	0.7
1"	46.6	100.0	100.0	83.1	16.2	16.9
3/4"	10.2	98.2	100.0	71.1	12.0	28.9
1/2"	2.3	78.9	100.0	62.9	8.2	37.1
3/8"	1.9	55.1	100.0	55.8	7.1	44.2
#4	1.7	13.8	96.0	42.1	13.7	57.9
#8	1.6	4.5	79.6	32.9	9.2	67.1
#16	1.6	2.7	62.9	25.9	7.1	74.1
#30	1.5	2.3	48.8	20.2	5.7	79.8
#50	1.5	2.2	28.2	12.1	8.1	87.9
#100	1.4	2.1	8.4	4.3	7.8	95.7
LBW	1.2	1.9	1.0	1.3	3.0	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:	66	Workability Factor:	33
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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: 12/21/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 12/22/2020 through 12/28/2020

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	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%



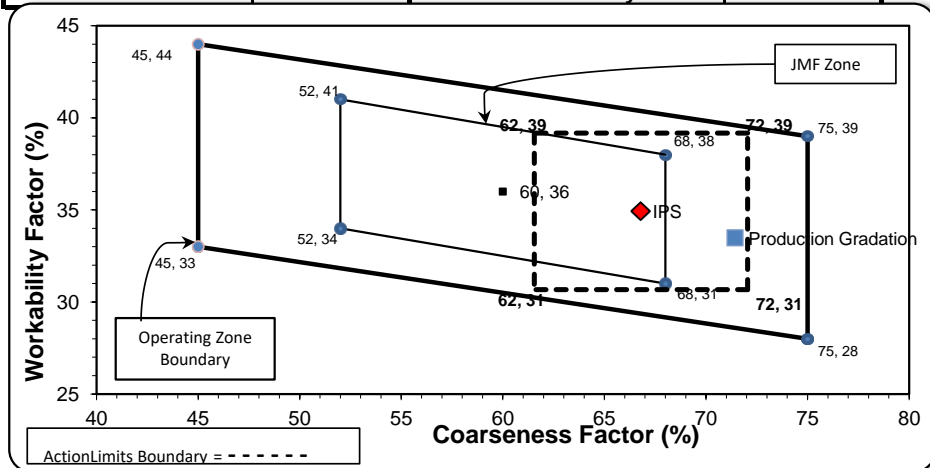
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.4	0.6	0.6
1"	54.9	100.0	100.0	85.3	14.1	14.7
3/4"	23.5	96.9	100.0	74.3	11.1	25.7
1/2"	6.0	73.8	100.0	62.4	11.9	37.6
3/8"	3.1	40.3	100.0	52.5	9.9	47.5
#4	2.5	8.8	96.2	42.3	10.2	57.7
#8	2.1	3.0	78.6	33.5	8.8	66.5
#16	1.9	2.2	61.9	26.4	7.1	73.6
#30	1.9	2.0	46.3	20.0	6.4	80.0
#50	1.7	2.0	21.9	10.0	10.0	90.0
#100	1.5	1.8	4.2	2.7	7.3	97.3
LBW	1.2	1.4	0.8	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:	71	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: