

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 7/15/19

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 7/16/2019 through 7/22/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	48.5
26A	58-003	Stoneco	385	2.29	2.69	12.4
2NS	38-046	Chelsea	1210	7.35	2.64	39.1
Total Wt			3095	18.57		100.0

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



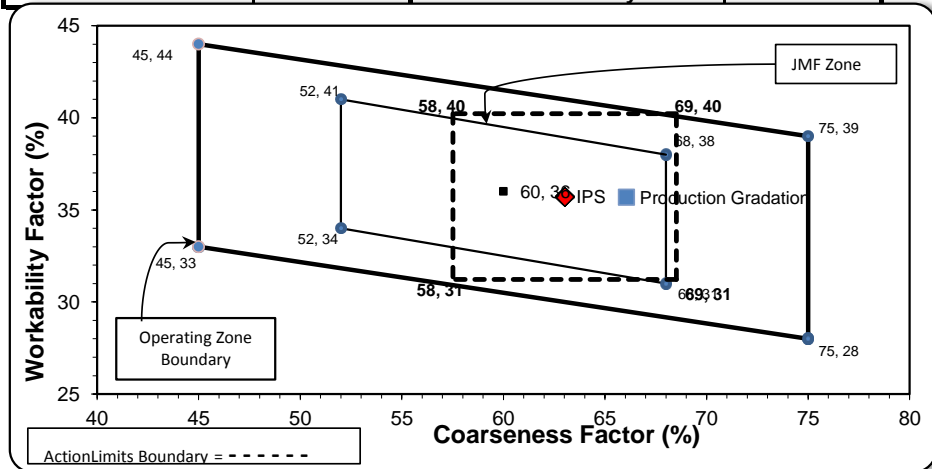
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	6AA	26A	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"	99.0	100.0	100.0	99.5	0.5	0.5
3/4"	74.1	100.0	100.0	87.4	12.1	12.6
1/2"	35.2	99.8	100.0	68.6	18.9	31.4
3/8"	15.0	89.6	100.0	57.5	11.1	42.5
#4	1.2	25.1	100.0	42.8	14.7	57.2
#8	0.7	6.9	88.2	35.7	7.1	64.3
#16	0.6	2.9	63.0	25.3	10.4	74.7
#30	0.5	2.2	40.4	16.3	9.0	83.7
#50	0.4	2.0	18.6	7.7	8.6	92.3
#100	0.4	1.9	3.4	1.8	6.0	98.2
LBW	0.3	1.7	0.7	0.6	1.1	99.4

*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:	36
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Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.2	0.8	0.8
3/4"	90.9	8.3	9.1
1/2"	71.3	19.6	28.7
3/8"	59.5	11.8	40.5
#4	43.8	15.7	56.2
#8	35.7	8.1	64.3
#16	27.0	8.7	73.0
#30	18.6	8.4	81.4
#50	6.8	11.8	93.2
#100	1.4	5.4	98.6
LBW	0.6	0.8	99.4

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 7/15/19

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 7/16/2019 through 7/22/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1820	11.13	2.62	59.7
26A	71-47	Presque Isle	0	0.00	2.62	0.0
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

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

Sieve	6AA	26A	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"	98.5	100.0	100.0	99.1	0.9	0.9
3/4"	83.8	100.0	100.0	90.3	8.8	9.7
1/2"	45.5	97.2	100.0	67.5	22.9	32.5
3/8"	30.8	87.9	100.0	58.7	8.8	41.3
#4	6.1	23.9	97.3	42.9	15.8	57.1
#8	2.4	7.3	83.9	35.3	7.6	64.7
#16	1.9	3.8	66.0	27.8	7.5	72.2
#30	1.8	3.1	44.8	19.1	8.6	80.9
#50	1.7	2.8	18.8	8.6	10.5	91.4
#100	1.6	2.5	3.8	2.5	6.1	97.5
LBW	1.2	2.0	0.7	1.0	1.5	99.0

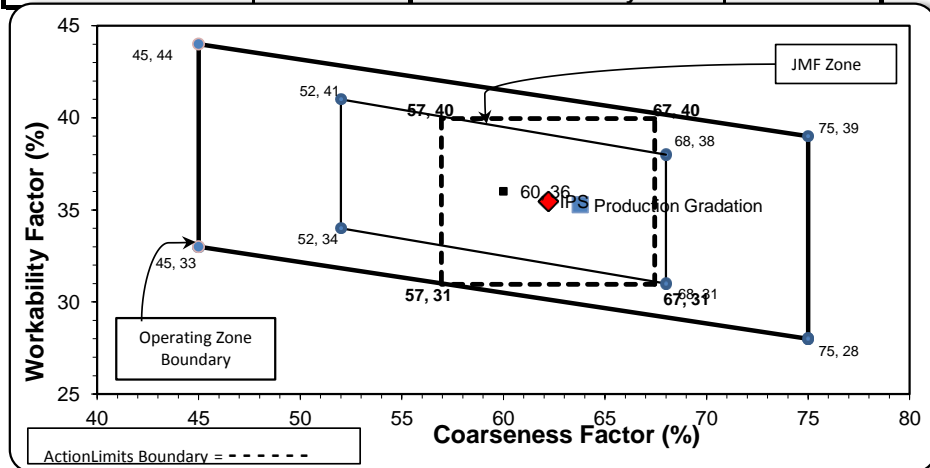


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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: **64** **Workability Factor:** **35**



Initial Production Sample (IPS)

Coarseness Factor:		62	
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"	100.0	0.0	0.0
3/4"	94.0	6.0	6.0
1/2"	70.2	23.7	29.8
3/8"	59.9	10.4	40.1
#4	42.7	17.2	57.3
#8	35.5	7.2	64.5
#16	28.4	7.0	71.6
#30	19.2	9.2	80.8
#50	8.9	10.3	91.1
#100	3.1	5.9	96.9
LBW	1.4	1.7	98.6

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 7/15/19

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 7/16/2019 through 7/22/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	45.9
26A	71-47	Presque Isle	450	2.75	2.62	14.8
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
Total Wt			3050	18.57		100.0

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



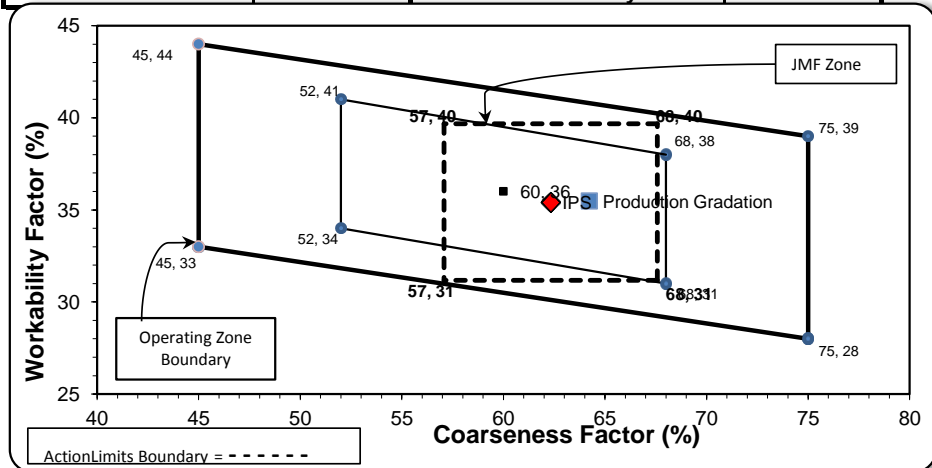
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.5	100.0	100.0	98.9	1.1	1.1
3/4"	75.2	100.0	100.0	88.6	10.2	11.4
1/2"	29.2	97.2	100.0	67.1	21.5	32.9
3/8"	13.6	87.9	100.0	58.6	8.5	41.4
#4	2.2	23.9	97.8	43.0	15.5	57.0
#8	1.4	7.3	85.8	35.5	7.5	64.5
#16	1.3	3.8	71.2	29.2	6.3	70.8
#30	1.2	3.1	52.6	21.7	7.5	78.3
#50	1.2	2.8	21.4	9.4	12.3	90.6
#100	1.0	2.5	1.9	1.6	7.8	98.4
LBW	0.6	2.0	0.2	0.6	0.9	99.4

*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:	64	Workability Factor:	35
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Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.1	0.9	0.9
3/4"	90.5	8.6	9.5
1/2"	69.8	20.7	30.2
3/8"	59.8	10.0	40.2
#4	42.2	17.6	57.8
#8	35.4	6.7	64.6
#16	28.8	6.7	71.2
#30	21.4	7.4	78.6
#50	8.8	12.6	91.2
#100	1.8	7.0	98.2
LBW	0.7	1.0	99.3

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Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 7/15/19

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 7/16/2019 through 7/22/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1780	10.89	2.62	58.4
26A	71-47	Presque Isle	0	0.00	2.62	0.0
2NS	44-051	Krake Willis Rd	1270	7.68	2.65	41.6
Total Wt			3050	18.57		100.0

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

Sieve	6AA	26A	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"	98.4	100.0	100.0	99.1	0.9	0.9
3/4"	88.5	100.0	100.0	93.3	5.8	6.7
1/2"	52.3	95.9	100.0	72.2	21.1	27.8
3/8"	33.3	83.7	100.0	61.1	11.1	38.9
#4	6.4	12.3	96.1	43.8	17.3	56.2
#8	2.4	3.2	82.1	35.6	8.2	64.4
#16	1.7	1.8	65.4	28.2	7.4	71.8
#30	1.5	1.5	49.3	21.4	6.8	78.6
#50	1.5	1.4	26.6	12.0	9.5	88.0
#100	1.4	1.3	7.7	4.0	7.9	96.0
LBW	1.3	1.2	1.3	1.3	2.7	98.7

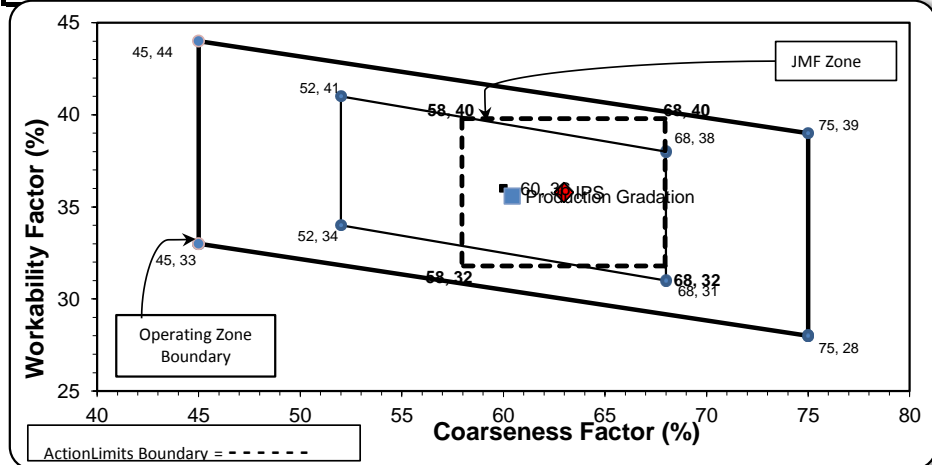


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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**



Initial Production Sample (IPS)

Coarseness Factor: 63		Workability Factor: 36	
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	89.8	10.2	10.2
1/2"	70.7	19.1	29.3
3/8"	59.6	11.1	40.4
#4	43.2	16.4	56.8
#8	35.8	7.4	64.2
#16	29.2	6.6	70.8
#30	21.4	7.8	78.6
#50	9.8	11.6	90.2
#100	3.7	6.1	96.3
LBW	1.2	2.5	98.8

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: P-02

Sample Date: 7/15/19

Concrete Grade: S2M

Contractor: _____

Dates Test Represents: 7/16/2019 through 7/22/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	47.5
26A	71-47	Presque Isle	400	2.45	2.62	13.1
2NS	47-16	Buno Rd	1200	7.26	2.65	39.3
Total Wt			3050	18.57		100.0

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



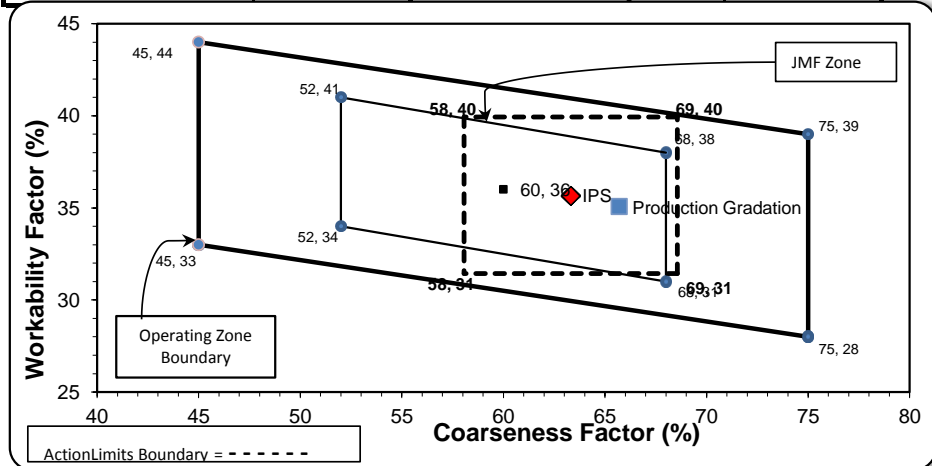
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.5	100.0	100.0	98.8	1.2	1.2
3/4"	75.2	100.0	100.0	88.2	10.6	11.8
1/2"	29.2	97.2	100.0	66.0	22.2	34.0
3/8"	13.6	87.9	100.0	57.3	8.6	42.7
#4	2.2	23.9	96.0	42.0	15.4	58.0
#8	1.4	7.3	85.0	35.1	6.9	64.9
#16	1.3	3.8	71.0	29.1	6.0	70.9
#30	1.2	3.1	50.8	21.0	8.1	79.0
#50	1.2	2.8	15.6	7.1	13.9	92.9
#100	1.0	2.5	1.8	1.5	5.6	98.5
LBW	0.6	2.0	0.3	0.7	0.8	99.3

*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:	35
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Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.6	4.4	4.4
1/2"	73.1	22.6	26.9
3/8"	59.3	13.8	40.7
#4	42.8	16.5	57.2
#8	35.7	7.1	64.3
#16	28.9	6.8	71.1
#30	20.7	8.2	79.3
#50	9.9	10.8	90.1
#100	2.1	7.8	97.9
LBW	0.9	1.2	99.1

PREPARED BY:
 SM, LLC Technical Service

Approved By: