

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 11/16/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 11/17/2020 through 11/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1675	10.25	2.62	54.8
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	75-051	Mid-Michigan	1230	7.41	2.66	40.3
Total Wt			3055	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"	98.0	100.0	100.0	98.9	1.1	1.1
3/4"	81.4	100.0	100.0	89.8	9.1	10.2
1/2"	41.4	98.8	100.0	67.8	22.0	32.2
3/8"	24.0	89.7	100.0	57.8	10.0	42.2
#4	4.2	18.9	98.1	42.7	15.1	57.3
#8	2.0	5.0	80.7	33.8	8.9	66.2
#16	1.7	2.8	63.9	26.8	7.0	73.2
#30	1.6	2.3	47.6	20.2	6.6	79.8
#50	1.6	2.1	23.6	10.5	9.7	89.5
#100	1.5	2.0	4.6	2.8	7.7	97.2
LBW	1.4	1.8	0.6	1.1	1.7	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

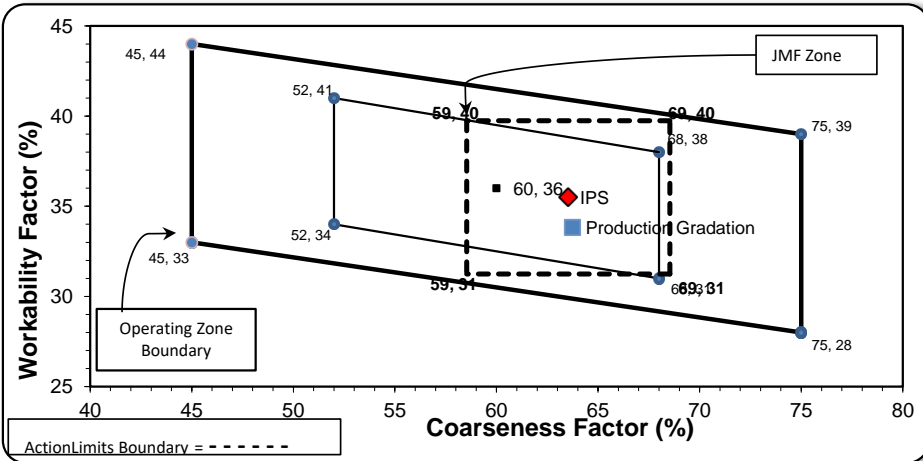
Coarseness Factor:	64	Workability Factor:	34
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Initial Production Sample (IPS)

Coarseness Factor:	64
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Workability Factor:	35
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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"	93.9	6.1	6.1
1/2"	71.4	22.5	28.6
3/8"	59.0	12.4	41.0
#4	45.1	13.9	54.9
#8	35.5	9.6	64.5
#16	28.3	7.2	71.7
#30	21.3	6.9	78.7
#50	11.0	10.3	89.0
#100	3.4	7.6	96.6
LBW	1.1	2.3	98.9



PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 11/16/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 11/17/2020 through 11/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1670	10.21	2.62	54.8
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

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



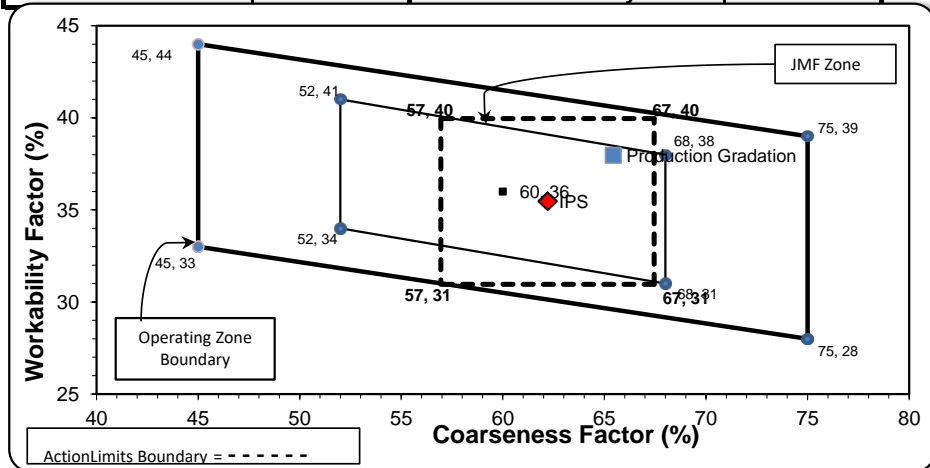
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	97.8	100.0	100.0	98.8	1.2	1.2
3/4"	80.8	100.0	100.0	89.5	9.3	10.5
1/2"	42.6	97.6	100.0	68.5	21.0	31.5
3/8"	26.8	89.7	100.0	59.4	9.0	40.6
#4	5.6	21.6	97.2	43.3	16.1	56.7
#8	2.6	5.9	89.9	38.0	5.4	62.0
#16	2.4	2.9	60.8	26.0	12.0	74.0
#30	2.2	2.4	39.2	17.1	8.8	82.9
#50	2.1	2.3	24.6	11.2	5.9	88.8
#100	2.0	2.1	8.7	4.7	6.5	95.3
LBW	1.6	1.9	1.2	1.5	3.3	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: 65 **Workability Factor:** 38



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

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 11/16/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 11/17/2020 through 11/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	50.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
Total Wt			3050	18.57		100.0

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



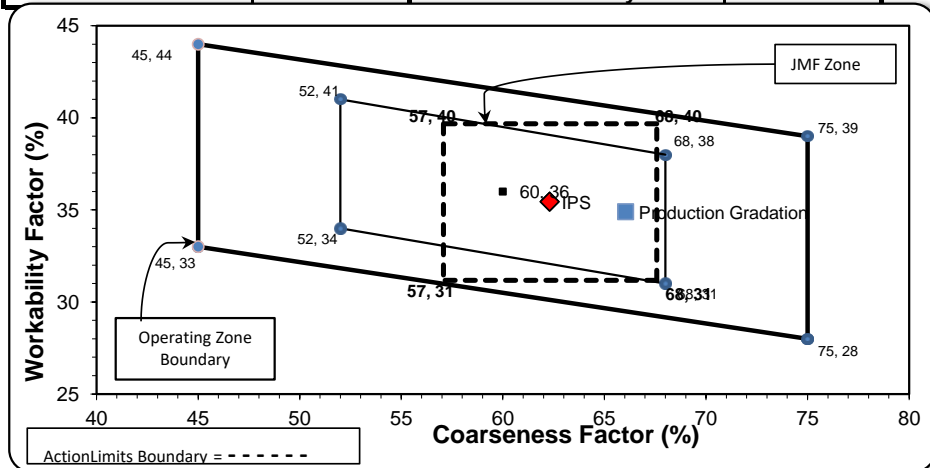
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	95.4	100.0	100.0	97.7	2.3	2.3
3/4"	63.4	100.0	100.0	81.4	16.3	18.6
1/2"	33.9	97.6	100.0	66.2	15.2	33.8
3/8"	17.4	89.7	100.0	57.0	9.2	43.0
#4	6.0	21.6	96.8	43.3	13.8	56.7
#8	3.2	5.9	83.1	34.9	8.4	65.1
#16	2.6	2.9	67.8	28.3	6.6	71.7
#30	2.4	2.4	47.8	20.3	8.0	79.7
#50	2.2	2.3	17.0	8.0	12.2	92.0
#100	2.0	2.1	1.8	1.9	6.1	98.1
LBW	1.5	1.9	0.4	1.1	0.8	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:	35
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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"	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

PREPARED BY:
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Approved By:

Aggregate Optimization Chart

PLANT #: **P-02**

Sample Date: 11/16/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 11/17/2020 through 11/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	50.8
26A	71-47	Presque Isle	200	1.22	2.62	6.6
2NS	63-115	Ray Rd	1300	7.86	2.65	42.6
Total Wt			3050	18.57		100.0

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



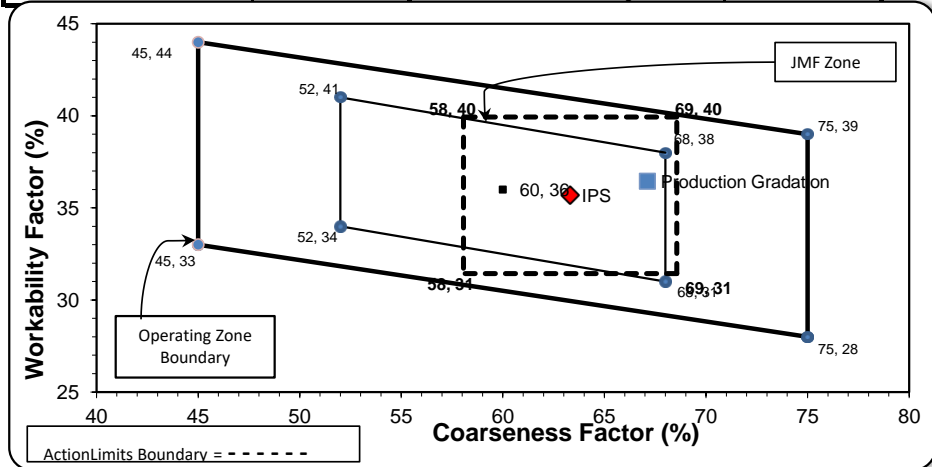
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	95.4	100.0	100.0	97.7	2.3	2.3
3/4"	63.4	100.0	100.0	81.4	16.3	18.6
1/2"	33.9	97.6	100.0	66.3	15.1	33.7
3/8"	17.4	89.7	100.0	57.3	8.9	42.7
#4	6.0	21.6	97.7	46.1	11.2	53.9
#8	3.2	5.9	80.8	36.5	9.7	63.5
#16	2.6	2.9	64.7	29.1	7.4	70.9
#30	2.4	2.4	49.0	22.3	6.8	77.7
#50	2.2	2.3	23.0	11.1	11.2	88.9
#100	2.0	2.1	3.8	2.8	8.3	97.2
LBW	1.5	1.9	0.4	1.1	1.7	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: 67 **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"	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: