

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 3/16/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/17/2020 through 3/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	700	4.28	2.62	22.8
IA	71-47	Presque Isle	1100	6.73	2.62	35.8
2NS	63-115	Ray Rd	1270	7.68	2.65	41.4
Total Wt			3070	18.69		100.0

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



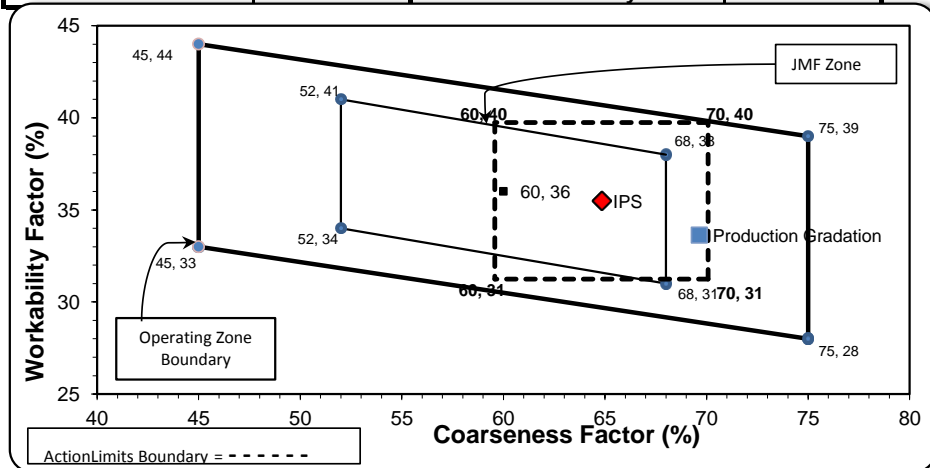
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.3	100.0	100.0	98.9	1.1	1.1
1"	46.6	100.0	100.0	87.8	11.1	12.2
3/4"	16.9	93.8	100.0	78.8	9.0	21.2
1/2"	9.1	59.9	100.0	64.9	13.9	35.1
3/8"	7.1	30.1	100.0	53.8	11.1	46.2
#4	4.0	5.8	95.6	42.5	11.2	57.5
#8	2.9	3.1	77.0	33.6	8.9	66.4
#16	2.7	2.5	60.7	26.6	7.0	73.4
#30	2.6	2.4	46.1	20.5	6.1	79.5
#50	2.5	2.3	24.8	11.7	8.9	88.3
#100	2.3	2.1	5.3	3.5	8.2	96.5
LBW	1.7	1.7	1.1	1.5	2.0	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:	70	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"	99.4	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

Approved By:

Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 3/16/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/17/2020 through 3/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	550	3.36	2.62	17.9
IA	71-47	Presque Isle	1320	8.07	2.62	43.0
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



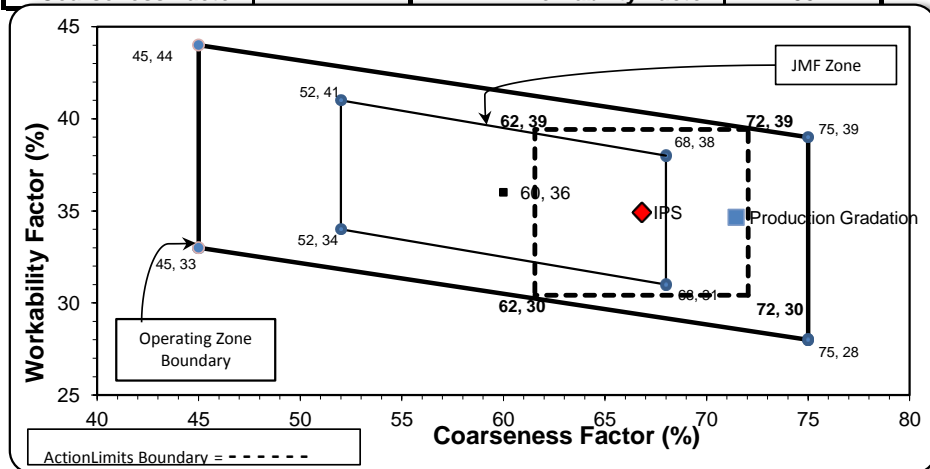
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.3	100.0	100.0	99.2	0.8	0.8
1"	46.6	100.0	100.0	90.4	8.7	9.6
3/4"	16.9	93.8	100.0	82.4	8.0	17.6
1/2"	9.1	59.9	100.0	66.5	16.0	33.5
3/8"	7.1	30.1	100.0	53.3	13.2	46.7
#4	4.0	5.8	97.3	41.2	12.1	58.8
#8	2.9	3.1	83.9	34.6	6.6	65.4
#16	2.7	2.5	68.6	28.4	6.3	71.6
#30	2.6	2.4	48.6	20.5	7.9	79.5
#50	2.5	2.3	20.4	9.4	11.1	90.6
#100	2.3	2.1	3.0	2.5	6.9	97.5
LBW	1.7	1.7	0.6	1.3	1.2	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:	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

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 3/16/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/17/2020 through 3/23/2020

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	850	5.20	2.62	27.7
2NS	63-92	Grange Hall	1220	7.38	2.65	39.7
Total Wt			3070	18.69		100.0

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

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	42.3	100.0	100.0	81.2	17.8	18.8
3/4"	14.3	99.0	100.0	71.8	9.4	28.2
1/2"	3.6	85.0	100.0	64.4	7.4	35.6
3/8"	2.7	64.5	100.0	58.5	6.0	41.5
#4	2.1	19.3	97.3	44.7	13.8	55.3
#8	1.9	6.7	83.9	35.8	8.9	64.2
#16	1.8	3.8	68.6	28.9	6.9	71.1
#30	1.7	3.1	48.6	20.7	8.2	79.3
#50	1.7	2.8	20.4	9.4	11.3	90.6
#100	1.6	2.6	3.0	2.4	7.0	97.6
LBW	1.4	2.4	0.6	1.4	1.1	98.6

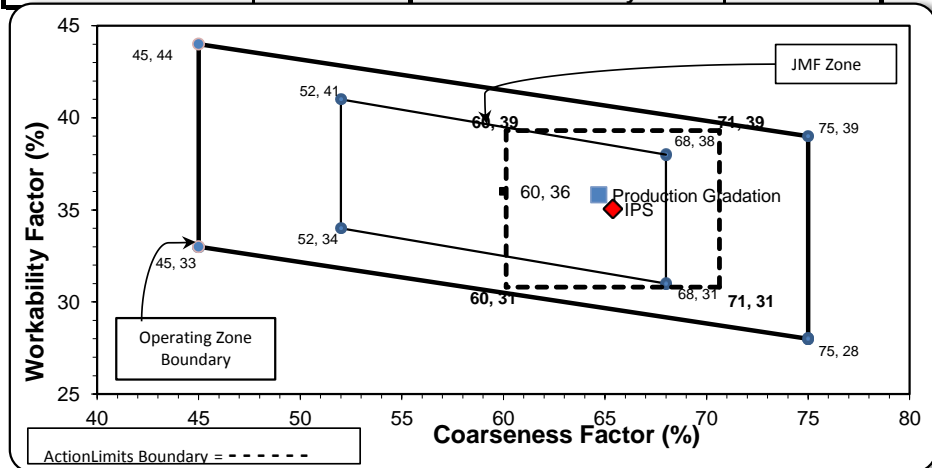


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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: 65 **Workability Factor: 36**



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: 3/16/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 3/17/2020 through 3/23/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	950	5.81	2.62	30.9
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



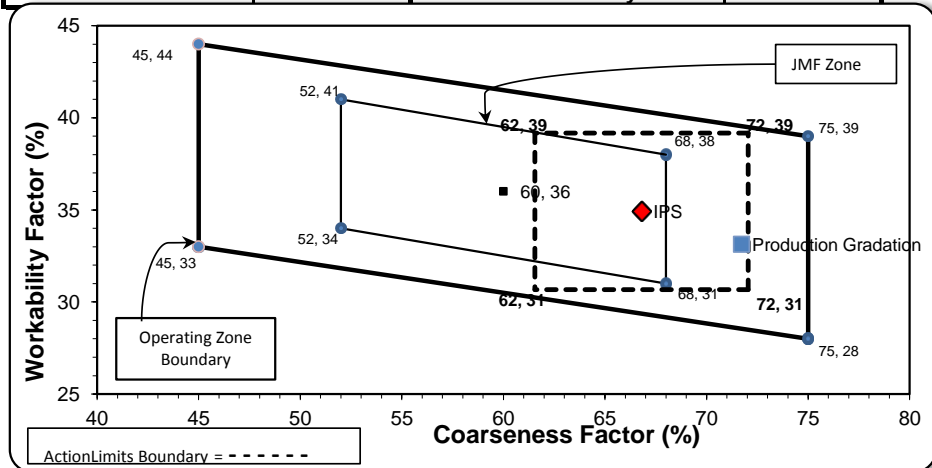
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.3	100.0	100.0	98.7	1.3	1.3
1"	46.6	100.0	100.0	84.9	13.8	15.1
3/4"	16.9	93.8	100.0	74.5	10.3	25.5
1/2"	9.1	59.9	100.0	61.8	12.7	38.2
3/8"	7.1	30.1	100.0	52.0	9.8	48.0
#4	4.0	5.8	95.6	41.9	10.2	58.1
#8	2.9	3.1	77.0	33.1	8.7	66.9
#16	2.7	2.5	60.7	26.3	6.9	73.7
#30	2.6	2.4	46.1	20.2	6.0	79.8
#50	2.5	2.3	24.8	11.5	8.7	88.5
#100	2.3	2.1	5.3	3.5	8.1	96.5
LBW	1.7	1.7	1.1	1.5	2.0	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:	72	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: