

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	42.9	100.0	100.0	81.0	19.0	19.0
3/4"	15.0	99.0	100.0	71.5	9.5	28.5
1/2"	4.9	81.2	100.0	63.2	8.3	36.8
3/8"	2.8	54.0	100.0	55.0	8.2	45.0
#4	2.2	10.7	98.3	42.1	12.9	57.9
#8	2.0	4.2	82.1	33.9	8.2	66.1
#16	2.0	2.8	65.9	27.2	6.7	72.8
#30	1.9	2.5	50.0	20.9	6.3	79.1
#50	1.9	2.4	25.7	11.3	9.5	88.7
#100	1.8	2.3	6.2	3.7	7.7	96.3
LBW	1.7	2.1	0.7	1.4	2.2	98.6

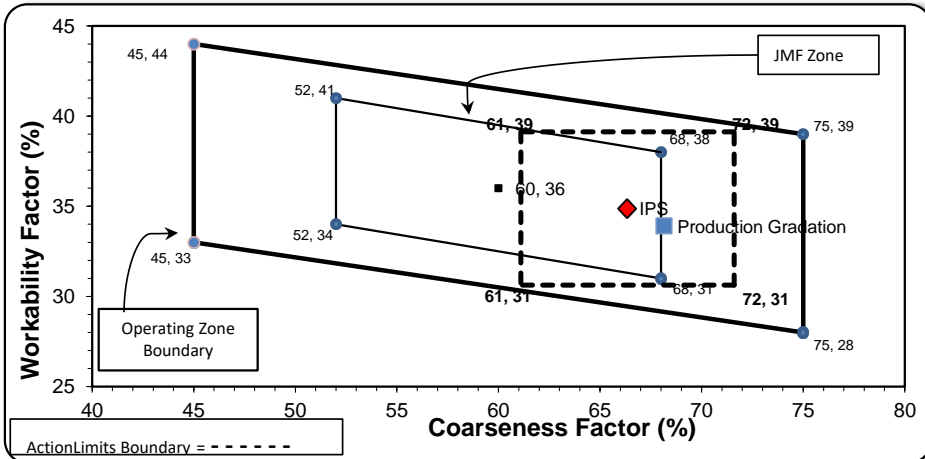
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	68	Workability Factor:	34
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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-102**

Sample Date: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1420	8.46	2.69	45.5
IA	58-003	Stoneco	500	2.98	2.69	16.0
2NS	63-114	Highland	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

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



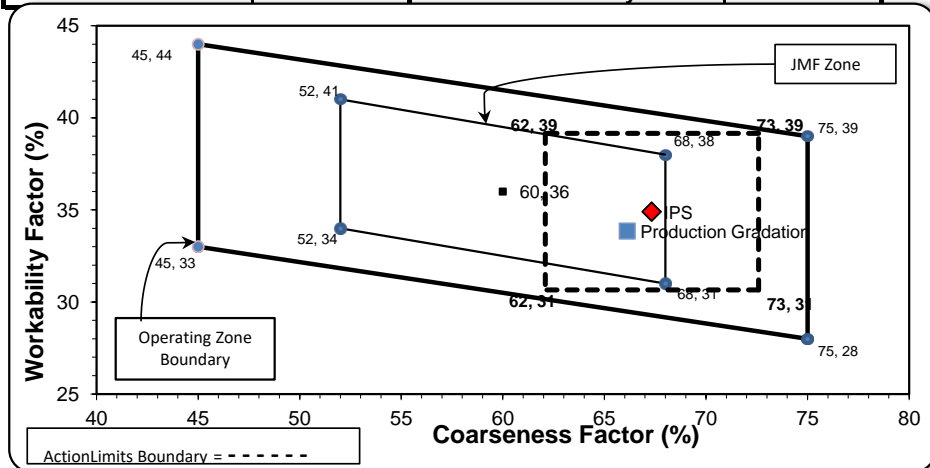
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	63.2	100.0	100.0	83.3	16.7	16.7
3/4"	45.4	100.0	100.0	75.2	8.1	24.9
1/2"	19.9	88.0	100.0	61.6	13.5	38.4
3/8"	10.8	80.4	100.0	56.3	5.4	43.7
#4	2.4	18.7	99.3	42.3	14.0	57.7
#8	2.0	6.8	82.8	33.8	8.4	66.2
#16	1.8	2.8	63.6	25.7	8.1	74.3
#30	1.3	2.1	45.4	18.4	7.3	81.6
#50	1.2	1.9	18.8	8.1	10.3	91.9
#100	1.0	1.8	4.0	2.3	5.8	97.7
LBW	0.8	1.5	0.3	0.7	1.6	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:	34
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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"	85.5	14.5	14.5
3/4"	73.4	12.1	26.6
1/2"	61.0	12.4	39.0
3/8"	56.2	4.8	43.8
#4	43.1	13.1	56.9
#8	34.9	8.2	65.1
#16	29.4	5.5	70.6
#30	21.6	7.8	78.4
#50	8.1	13.4	91.9
#100	2.2	5.9	97.8
LBW	1.4	0.8	98.6

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-12**

Sample Date: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

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	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



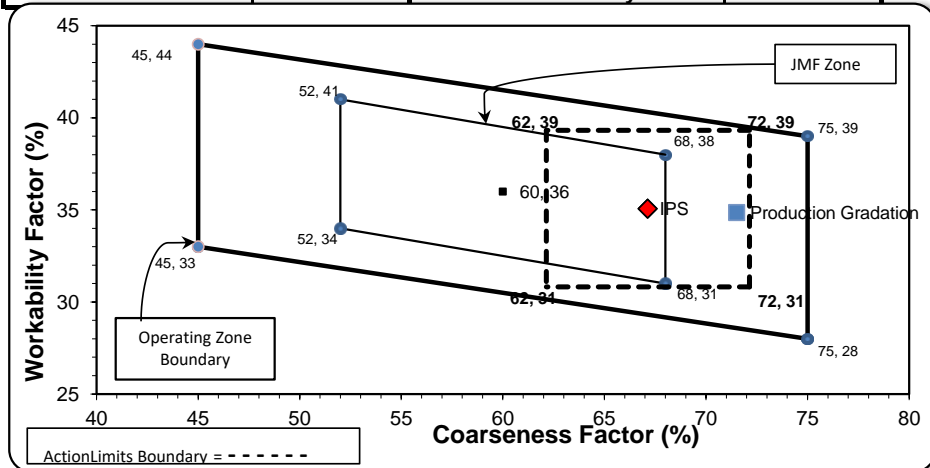
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	45.5	100.0	100.0	85.4	14.6	14.6
3/4"	14.7	91.0	100.0	74.3	11.2	25.7
1/2"	3.5	59.0	100.0	60.9	13.4	39.1
3/8"	2.8	36.7	100.0	53.4	7.5	46.6
#4	2.2	10.7	98.3	44.1	9.3	55.9
#8	2.0	4.5	80.7	34.9	9.2	65.1
#16	2.0	2.9	63.3	27.3	7.6	72.7
#30	1.9	2.4	47.3	20.5	6.7	79.5
#50	1.9	2.2	24.8	11.3	9.2	88.7
#100	1.8	2.0	4.7	3.0	8.3	97.0
LBW	1.6	1.6	0.3	1.1	2.0	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:	72	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"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.0	9.8	26.0
1/2"	63.7	10.3	36.3
3/8"	56.4	7.3	43.6
#4	43.0	13.4	57.0
#8	35.1	7.9	64.9
#16	29.0	6.1	71.0
#30	20.9	8.0	79.1
#50	8.1	12.8	91.9
#100	1.6	6.5	98.4
LBW	0.9	0.8	99.1

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	670	4.10	2.62	21.8
IA	71-47	Presque Isle	1150	7.03	2.62	37.5
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



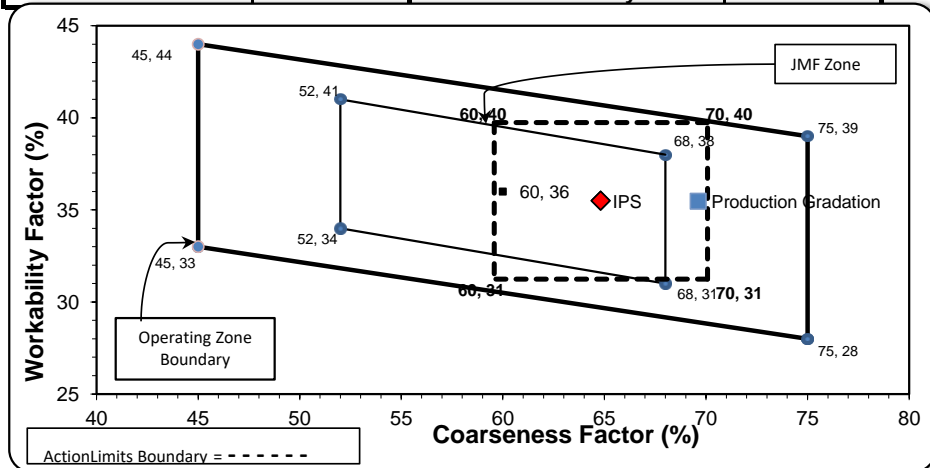
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	45.5	100.0	100.0	88.1	11.9	11.9
3/4"	14.7	91.0	100.0	78.0	10.1	22.0
1/2"	3.5	59.0	100.0	63.6	14.4	36.4
3/8"	2.8	36.7	100.0	55.1	8.5	44.9
#4	2.2	10.7	96.6	43.8	11.3	56.2
#8	2.0	4.5	81.9	35.5	8.4	64.5
#16	2.0	2.9	65.5	28.2	7.3	71.8
#30	1.9	2.4	45.0	19.6	8.6	80.4
#50	1.9	2.2	19.1	9.0	10.6	91.0
#100	1.8	2.0	3.8	2.7	6.3	97.3
LBW	1.6	1.6	0.4	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:	70	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"	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: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	650	3.98	2.62	21.2
IA	71-47	Presque Isle	1220	7.46	2.62	39.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



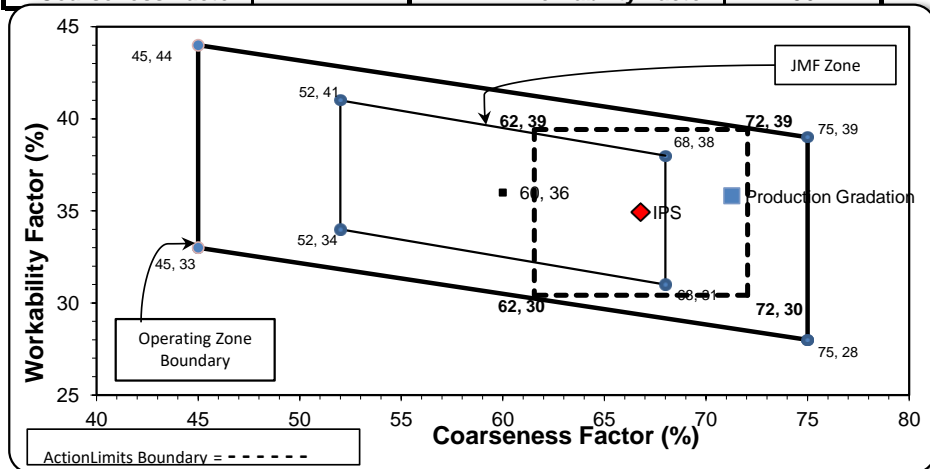
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	45.5	100.0	100.0	88.5	11.5	11.5
3/4"	14.7	91.0	100.0	78.4	10.1	21.6
1/2"	3.5	59.0	100.0	63.3	15.1	36.7
3/8"	2.8	36.7	100.0	54.3	9.0	45.7
#4	2.2	10.7	97.4	42.8	11.5	57.2
#8	2.0	4.5	86.0	35.8	7.0	64.2
#16	2.0	2.9	72.3	29.8	6.0	70.2
#30	1.9	2.4	51.0	21.3	8.5	78.7
#50	1.9	2.2	18.3	8.4	12.9	91.6
#100	1.8	2.0	1.9	1.9	6.5	98.1
LBW	1.6	1.6	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:	71	Workability Factor:	36
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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: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

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	44-051	Krake Willis Rd	1220	7.38	2.65	39.7
Total Wt			3070	18.69		100.0

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



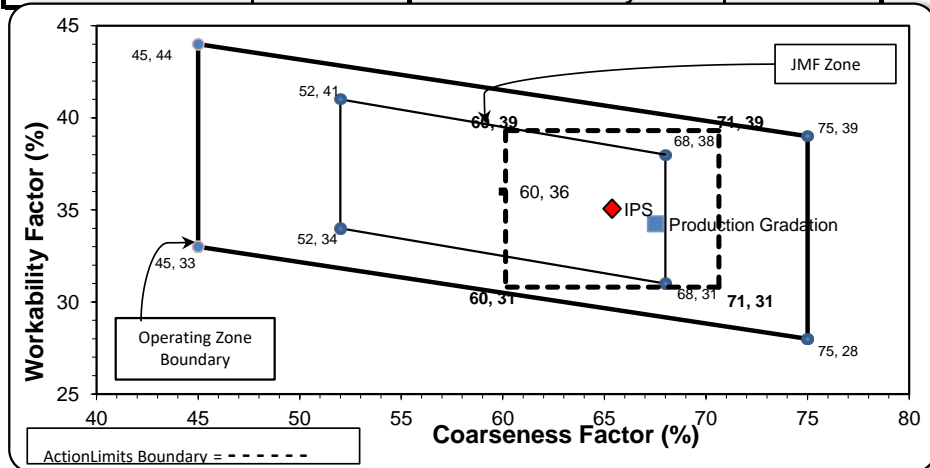
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	42.9	100.0	100.0	81.4	18.6	18.6
3/4"	15.0	99.0	100.0	72.0	9.4	28.0
1/2"	4.9	81.2	100.0	63.8	8.2	36.2
3/8"	2.8	54.0	100.0	55.6	8.2	44.4
#4	2.2	10.7	95.8	41.7	13.9	58.3
#8	2.0	4.2	81.6	34.2	7.5	65.8
#16	2.0	2.8	65.8	27.6	6.7	72.4
#30	1.9	2.5	51.0	21.6	6.0	78.4
#50	1.9	2.4	26.2	11.7	9.9	88.3
#100	1.8	2.3	7.6	4.2	7.5	95.8
LBW	1.7	2.1	1.2	1.6	2.6	98.4

*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: **68** **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: 7/27/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/28/2020 through 8/3/2020

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	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



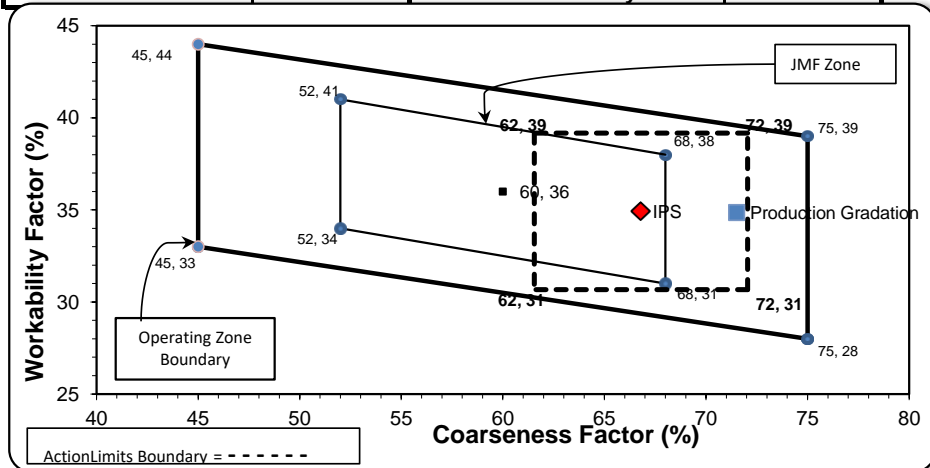
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 30701 W. 10 Mile Rd.
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	45.5	100.0	100.0	85.4	14.6	14.6
3/4"	14.7	91.0	100.0	74.3	11.2	25.7
1/2"	3.5	59.0	100.0	60.9	13.4	39.1
3/8"	2.8	36.7	100.0	53.4	7.5	46.6
#4	2.2	10.7	98.3	44.1	9.3	55.9
#8	2.0	4.5	80.7	34.9	9.2	65.1
#16	2.0	2.9	63.3	27.3	7.6	72.7
#30	1.9	2.4	47.3	20.5	6.7	79.5
#50	1.9	2.2	24.8	11.3	9.2	88.7
#100	1.8	2.0	4.7	3.0	8.3	97.0
LBW	1.6	1.6	0.3	1.1	2.0	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:	72	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"	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: