

Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

PLANT #: **P-101**

Sample Date: 7/16/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/17/2018 through 7/23/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	875	5.35	2.62	28.5
2NS	75-051	Mid-Michigan	1250	7.53	2.66	40.7
Total Wt			3075	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"	98.7	100.0	100.0	99.6	0.4	0.4
1"	48.4	100.0	100.0	84.1	15.5	15.9
3/4"	13.7	98.3	100.0	72.9	11.2	27.1
1/2"	4.9	80.6	100.0	65.1	7.8	34.9
3/8"	2.8	57.6	100.0	57.9	7.2	42.1
#4	1.9	8.8	99.0	43.3	14.6	56.7
#8	1.6	2.3	82.0	34.5	8.9	65.5
#16	1.5	1.7	67.4	28.3	6.1	71.7
#30	1.4	1.6	51.8	21.9	6.4	78.1
#50	1.4	1.6	24.8	11.0	11.0	89.0
#100	1.3	1.5	5.6	3.1	7.9	96.9
LBW	1.1	1.3	0.7	1.0	2.1	99.0

*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.

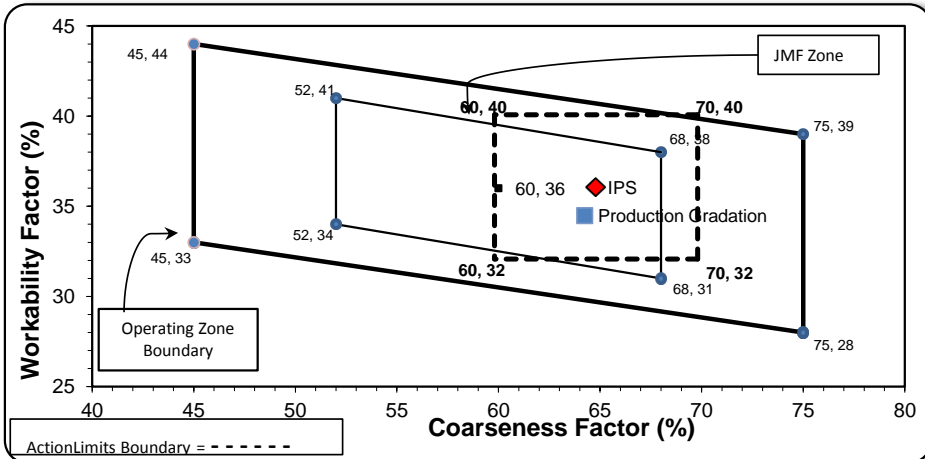
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

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

Coarseness Factor:	65
Workability Factor:	36

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.3	0.7	0.7
1"	83.6	15.7	16.4
3/4"	73.0	10.6	27.0
1/2"	65.1	7.9	34.9
3/8"	58.6	6.5	41.4
#4	45.8	12.8	54.2
#8	36.1	9.7	63.9
#16	28.8	7.3	71.2
#30	21.7	7.1	78.3
#50	10.3	11.4	89.7
#100	3.1	7.2	96.9
LBW	1.3	1.8	98.7



PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

PLANT #: **P-102**

Sample Date: 7/16/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/17/2018 through 7/23/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1350	8.04	2.69	43.3
IA	58-003	Stoneco	570	3.40	2.69	18.3
2NS	38-046	Chelsea	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

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



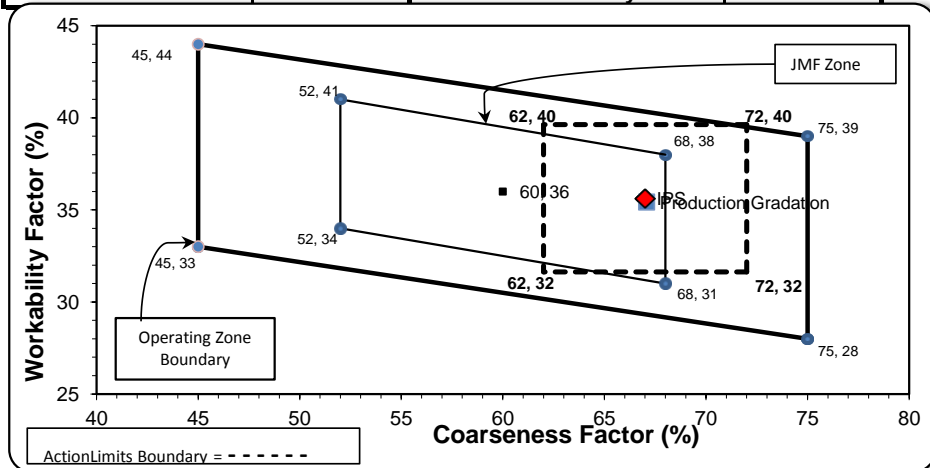
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 Suite 500
 Farmington Hills, MI 48336

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"	68.5	100.0	100.0	86.4	13.6	13.6
3/4"	40.8	100.0	100.0	74.4	12.0	25.6
1/2"	15.6	93.3	100.0	62.3	12.1	37.7
3/8"	7.3	82.5	100.0	56.7	5.6	43.3
#4	2.5	22.0	100.0	43.6	13.1	56.4
#8	1.8	6.5	87.0	35.4	8.1	64.6
#16	1.3	2.8	62.0	24.9	10.5	75.1
#30	1.2	2.0	42.0	17.0	7.9	83.0
#50	1.2	1.7	21.0	8.9	8.1	91.1
#100	1.2	1.6	5.0	2.7	6.2	97.3
LBW	1.2	1.4	0.8	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:	35
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Initial Production Sample (IPS)

Coarseness Factor:	67		
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"	87.2	12.8	12.8
3/4"	76.6	10.6	23.4
1/2"	64.4	12.2	35.6
3/8"	56.9	7.6	43.1
#4	44.1	12.7	55.9
#8	35.6	8.5	64.4
#16	27.7	8.0	72.3
#30	19.5	8.2	80.5
#50	7.8	11.6	92.2
#100	2.3	5.6	97.7
LBW	0.6	1.6	99.4

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

PLANT #: **P-103**

Sample Date: 7/16/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/17/2018 through 7/23/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1350	8.04	2.69	43.3
IA	58-003	Stoneco	570	3.40	2.69	18.3
2NS	38-046	Chelsea	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

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



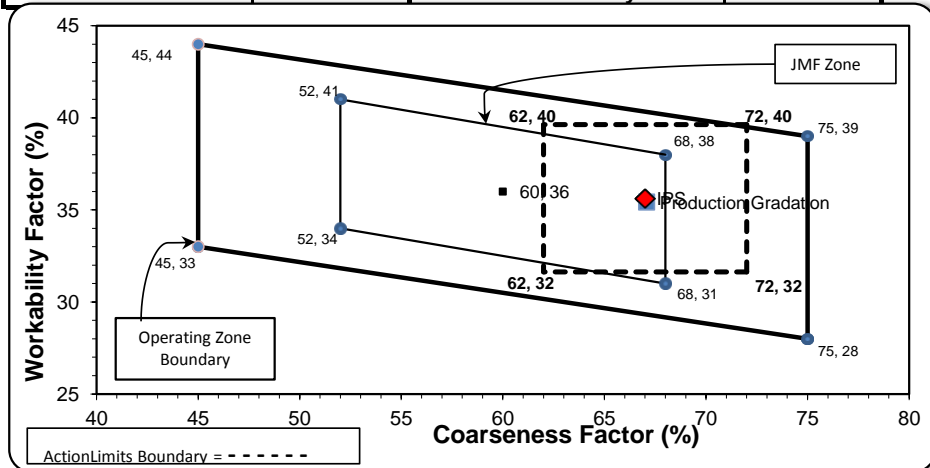
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	68.5	100.0	100.0	86.4	13.6	13.6
3/4"	40.8	100.0	100.0	74.4	12.0	25.6
1/2"	15.6	93.3	100.0	62.3	12.1	37.7
3/8"	7.3	82.5	100.0	56.7	5.6	43.3
#4	2.5	22.0	100.0	43.6	13.1	56.4
#8	1.8	6.5	87.0	35.4	8.1	64.6
#16	1.3	2.8	62.0	24.9	10.5	75.1
#30	1.2	2.0	42.0	17.0	7.9	83.0
#50	1.2	1.7	21.0	8.9	8.1	91.1
#100	1.2	1.6	5.0	2.7	6.2	97.3
LBW	1.2	1.4	0.8	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:** **35**



Initial Production Sample (IPS)

Coarseness Factor: **67**
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"	87.2	12.8	12.8
3/4"	76.6	10.6	23.4
1/2"	64.4	12.2	35.6
3/8"	56.9	7.6	43.1
#4	44.1	12.7	55.9
#8	35.6	8.5	64.4
#16	27.7	8.0	72.3
#30	19.5	8.2	80.5
#50	7.8	11.6	92.2
#100	2.3	5.6	97.7
LBW	0.6	1.6	99.4

PREPARED BY:
 SM, LLC Technical Service

Approved BY:

Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

PLANT #: **P-36**

Sample Date: 7/16/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/17/2018 through 7/23/2018

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	900	5.50	2.62	29.3
2NS	63-92	AA Grange Hall	1300	7.86	2.65	42.3
Total Wt			3070	18.69		100.0

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



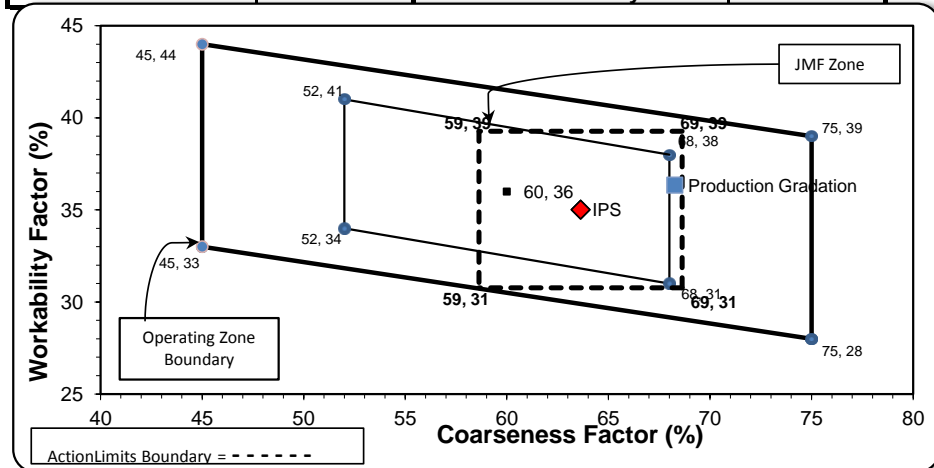
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.3	100.0	100.0	99.5	0.5	0.5
1"	49.5	100.0	100.0	85.7	13.8	14.3
3/4"	10.0	98.8	100.0	74.1	11.5	25.9
1/2"	1.5	76.0	100.0	65.1	9.1	34.9
3/8"	1.4	47.1	100.0	56.5	8.5	43.5
#4	1.3	5.4	97.0	43.0	13.5	57.0
#8	1.3	1.7	83.8	36.4	6.7	63.6
#16	1.3	1.4	69.3	30.1	6.2	69.9
#30	1.2	1.4	52.9	23.2	7.0	76.8
#50	1.2	1.3	26.6	12.0	11.2	88.0
#100	1.2	1.3	4.5	2.6	9.4	97.4
LBW	0.8	1.1	0.2	0.6	2.0	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:	68	Workability Factor:	36
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Initial Production Sample (IPS)

Coarseness Factor:	64		
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"	84.6	14.7	15.4
3/4"	74.4	10.3	25.6
1/2"	66.0	8.4	34.0
3/8"	58.7	7.4	41.3
#4	44.6	14.0	55.4
#8	35.0	9.6	65.0
#16	27.6	7.4	72.4
#30	19.5	8.1	80.5
#50	8.6	11.0	91.4
#100	2.0	6.6	98.0
LBW	0.9	1.1	99.1

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

PLANT #: **P-39**

Sample Date: 7/16/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/17/2018 through 7/23/2018

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	750	4.59	2.62	24.4
2NS	63-115	Ray Road	1320	7.98	2.65	43.0
Total Wt			3070	18.69		100.0

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



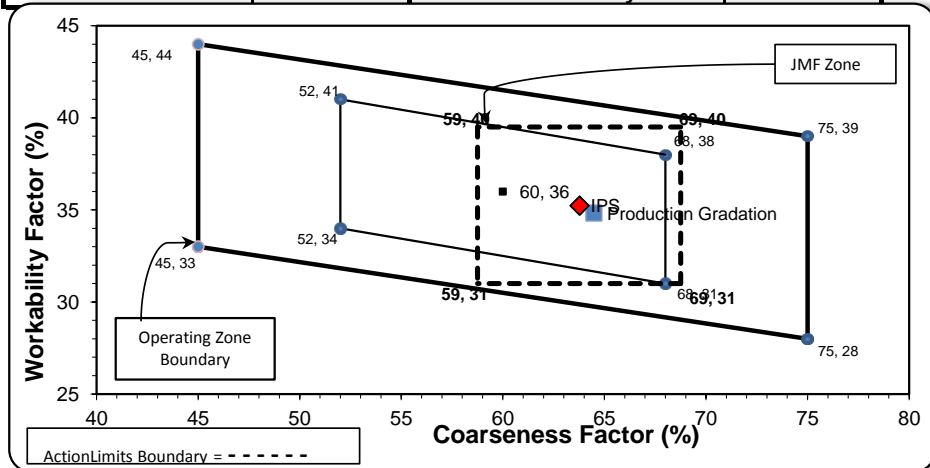
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.7	100.0	100.0	99.6	0.4	0.4
1"	48.4	100.0	100.0	83.2	16.4	16.8
3/4"	13.7	98.3	100.0	71.5	11.7	28.5
1/2"	4.9	80.6	100.0	64.3	7.2	35.7
3/8"	2.8	57.6	100.0	58.0	6.3	42.0
#4	1.9	8.8	95.8	44.0	14.0	56.0
#8	1.6	2.3	78.5	34.8	9.1	65.2
#16	1.5	1.7	61.9	27.5	7.3	72.5
#30	1.4	1.6	47.5	21.3	6.2	78.7
#50	1.4	1.6	26.7	12.3	8.9	87.7
#100	1.3	1.5	7.6	4.1	8.3	95.9
LBW	1.1	1.3	0.9	1.1	3.0	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: **64** Workability Factor: **35**



Initial Production Sample (IPS)

Coarseness Factor: 64		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"	84.3	15.1	15.7
3/4"	73.9	10.4	26.1
1/2"	65.7	8.2	34.3
3/8"	58.7	7.0	41.3
#4	45.1	13.6	54.9
#8	35.3	9.8	64.7
#16	28.1	7.2	71.9
#30	21.2	6.9	78.8
#50	10.1	11.1	89.9
#100	3.1	7.0	96.9
LBW	1.4	1.7	98.6

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

PLANT #: **P-02**

Sample Date: 7/16/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/17/2018 through 7/23/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	900	5.50	2.62	29.3
IA	71-47	Presque Isle	930	5.69	2.62	30.3
2NS	47-16	Buno Road	1240	7.50	2.65	40.4
Total Wt			3070	18.69		100.0

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



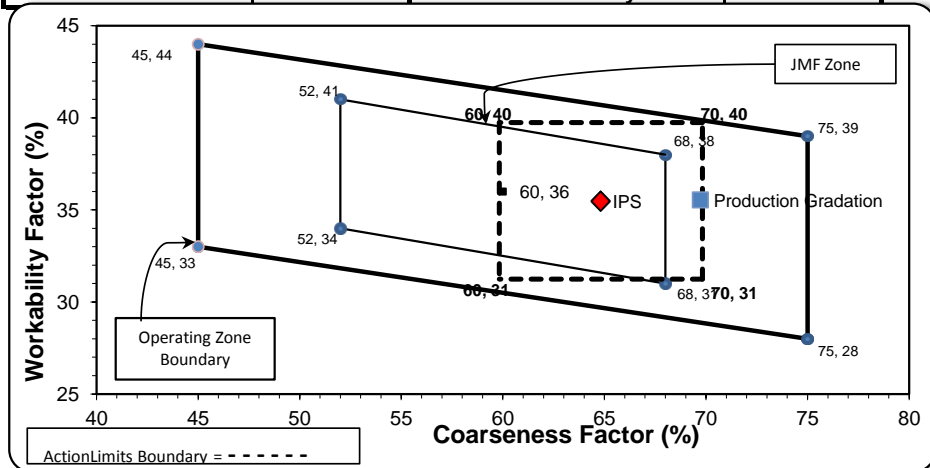
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.3	100.0	100.0	99.5	0.5	0.5
1"	49.5	100.0	100.0	85.2	14.3	14.8
3/4"	10.0	98.8	100.0	73.3	11.9	26.7
1/2"	1.5	76.0	100.0	63.9	9.4	36.1
3/8"	1.4	47.1	100.0	55.1	8.8	44.9
#4	1.3	5.4	96.3	40.9	14.2	59.1
#8	1.3	1.7	85.8	35.6	5.4	64.4
#16	1.3	1.4	72.1	29.9	5.6	70.1
#30	1.2	1.4	52.4	21.9	8.0	78.1
#50	1.2	1.3	18.6	8.3	13.7	91.7
#100	1.2	1.3	2.4	1.7	6.5	98.3
LBW	0.8	1.1	0.4	0.7	1.0	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: **70** **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"	99.4	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: