

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 5/3/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/4/2021 through 5/10/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
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"	97.9	100.0	100.0	99.3	0.7	0.7
1"	47.6	100.0	100.0	81.7	17.5	18.3
3/4"	12.7	98.3	100.0	69.1	12.6	30.9
1/2"	3.3	83.1	100.0	61.9	7.2	38.1
3/8"	2.0	62.8	100.0	56.1	5.7	43.9
#4	1.7	14.6	98.7	43.0	13.2	57.0
#8	1.6	5.2	80.2	33.3	9.7	66.7
#16	1.6	2.9	61.9	25.5	7.8	74.5
#30	1.5	2.3	44.1	18.4	7.1	81.6
#50	1.4	2.2	20.4	9.0	9.3	91.0
#100	1.3	2.0	5.2	3.0	6.0	97.0
LBW	1.1	1.8	0.5	1.0	2.0	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

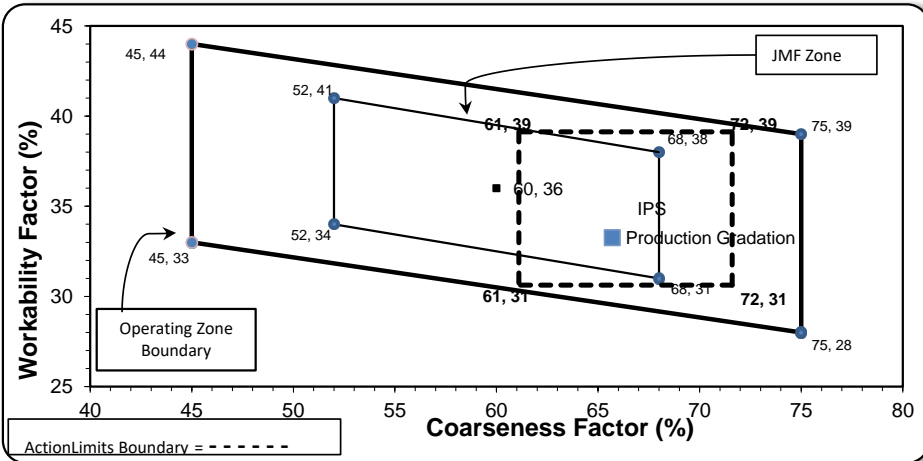
Coarseness Factor: 66 **Workability Factor: 33**

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-12**

Sample Date: 5/3/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/4/2021 through 5/10/2021

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	920	5.63	2.62	30.0
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



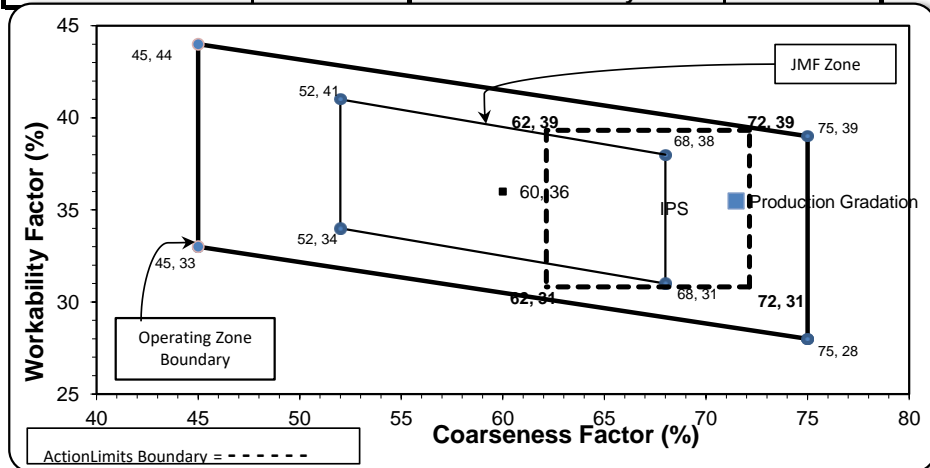
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.6	0.4	0.4
1"	47.3	100.0	100.0	84.6	15.0	15.4
3/4"	16.0	97.6	100.0	74.7	9.9	25.3
1/2"	4.5	72.1	100.0	63.6	11.0	36.4
3/8"	2.5	41.5	100.0	53.9	9.8	46.1
#4	2.1	7.3	96.7	42.2	11.7	57.8
#8	2.0	4.9	82.1	35.5	6.7	64.5
#16	1.9	3.2	67.9	29.2	6.3	70.8
#30	1.8	2.6	50.7	22.0	7.2	78.0
#50	1.7	2.3	24.7	11.2	10.7	88.8
#100	1.6	2.0	4.5	2.9	8.3	97.1
LBW	1.3	1.5	0.4	1.0	1.9	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:	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"	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: 5/3/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/4/2021 through 5/10/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	800	4.89	2.62	26.1
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



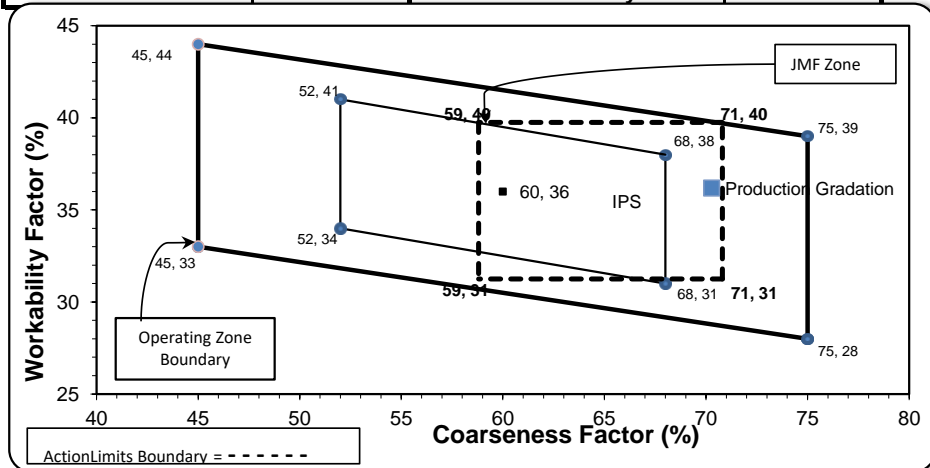
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.6	0.4	0.4
1"	47.3	100.0	100.0	86.3	13.4	13.7
3/4"	16.0	97.6	100.0	77.3	9.0	22.7
1/2"	4.5	72.1	100.0	65.8	11.5	34.2
3/8"	2.5	41.5	100.0	55.2	10.7	44.8
#4	2.1	7.3	97.1	42.5	12.6	57.5
#8	2.0	4.9	83.6	36.2	6.3	63.8
#16	1.9	3.2	66.1	28.5	7.7	71.5
#30	1.8	2.6	43.0	18.8	9.6	81.2
#50	1.7	2.3	19.1	9.0	9.9	91.0
#100	1.6	2.0	5.5	3.3	5.7	96.7
LBW	1.3	1.5	1.6	1.5	1.8	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:	36
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Intial Production Sample (IPS)

Coarseness Factor:	65		
Workability Factor:	36		
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.0	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: 5/3/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/4/2021 through 5/10/2021

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	1050	6.42	2.62	34.2
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



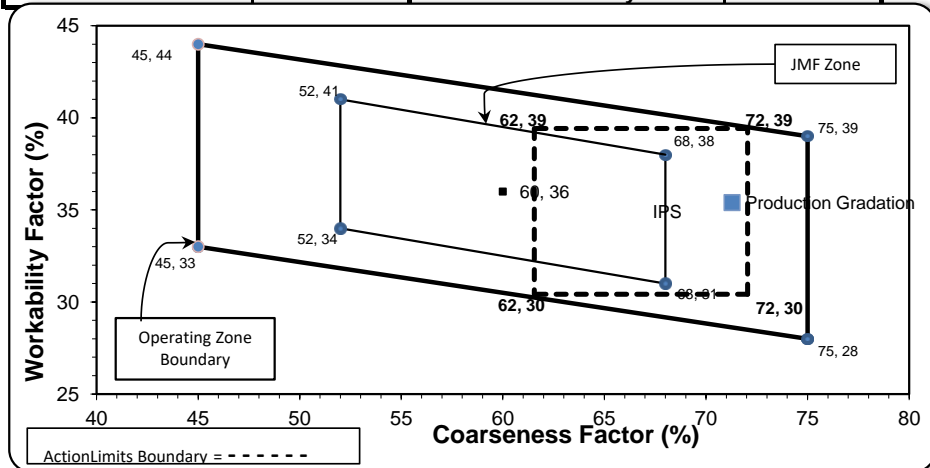
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.6	0.4	0.4
1"	47.3	100.0	100.0	85.9	13.7	14.1
3/4"	16.0	97.6	100.0	76.7	9.2	23.3
1/2"	4.5	72.1	100.0	64.9	11.8	35.1
3/8"	2.5	41.5	100.0	53.9	11.0	46.1
#4	2.1	7.3	97.5	41.2	12.8	58.8
#8	2.0	4.9	84.9	35.4	5.8	64.6
#16	1.9	3.2	71.5	29.5	5.8	70.5
#30	1.8	2.6	53.2	22.2	7.4	77.8
#50	1.7	2.3	23.6	10.5	11.7	89.5
#100	1.6	2.0	3.2	2.4	8.1	97.6
LBW	1.3	1.5	0.4	1.0	1.3	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:	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: 5/3/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/4/2021 through 5/10/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
2NS	44-051	Krake Willis Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



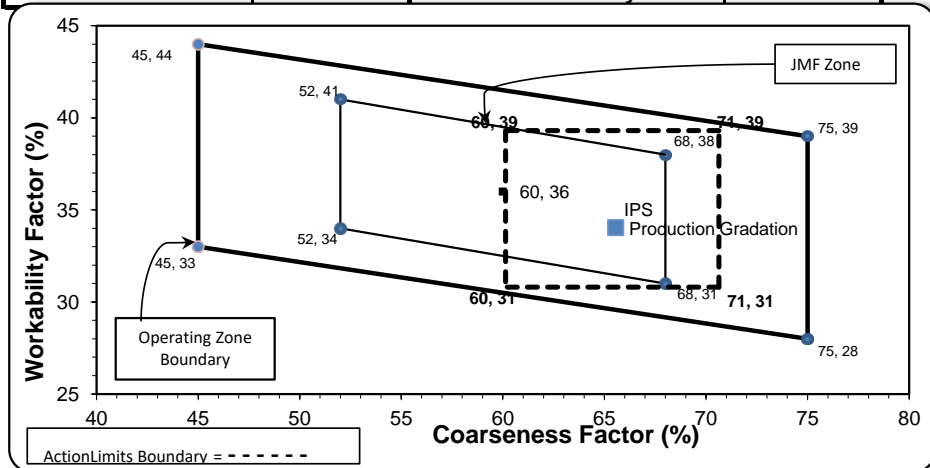
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.9	100.0	100.0	99.3	0.7	0.7
1"	47.6	100.0	100.0	81.7	17.5	18.3
3/4"	12.7	98.3	100.0	69.2	12.6	30.8
1/2"	3.3	83.1	100.0	62.2	7.0	37.8
3/8"	2.0	62.8	100.0	56.8	5.4	43.2
#4	1.7	14.6	96.1	43.3	13.5	56.7
#8	1.6	5.2	79.1	34.0	9.3	66.0
#16	1.6	2.9	64.5	27.5	6.5	72.5
#30	1.5	2.3	49.8	21.4	6.2	78.6
#50	1.4	2.2	26.9	12.0	9.4	88.0
#100	1.3	2.0	6.8	3.7	8.3	96.3
LBW	1.1	1.8	0.5	1.0	2.7	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:	66	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"	99.6	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: 5/3/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/4/2021 through 5/10/2021

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	920	5.63	2.62	30.0
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



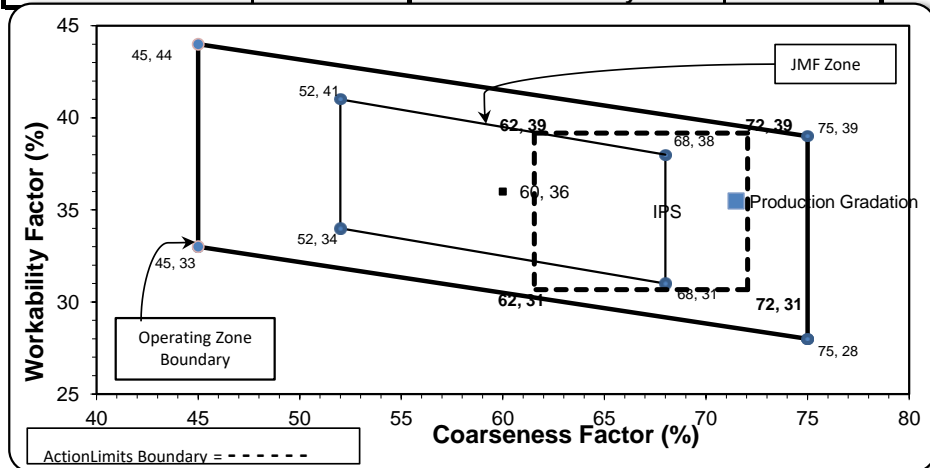
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.6	0.4	0.4
1"	47.3	100.0	100.0	84.6	15.0	15.4
3/4"	16.0	97.6	100.0	74.7	9.9	25.3
1/2"	4.5	72.1	100.0	63.6	11.0	36.4
3/8"	2.5	41.5	100.0	53.9	9.8	46.1
#4	2.1	7.3	96.7	42.2	11.7	57.8
#8	2.0	4.9	82.1	35.5	6.7	64.5
#16	1.9	3.2	67.9	29.2	6.3	70.8
#30	1.8	2.6	50.7	22.0	7.2	78.0
#50	1.7	2.3	24.7	11.2	10.7	88.8
#100	1.6	2.0	4.5	2.9	8.3	97.1
LBW	1.3	1.5	0.4	1.0	1.9	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: **71** **Workability Factor:** **35**



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: