

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 6/22/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

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%



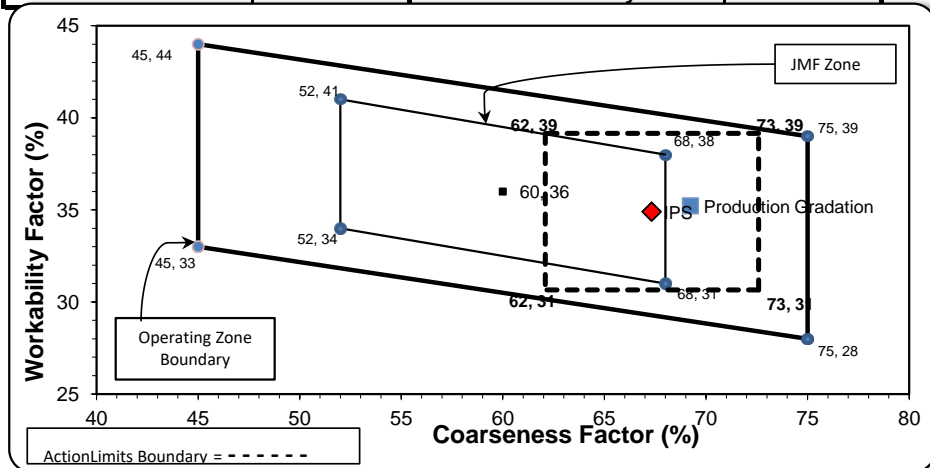
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	62.9	100.0	100.0	83.1	16.9	16.9
3/4"	36.5	100.0	100.0	71.1	12.0	28.9
1/2"	15.8	86.8	100.0	59.6	11.5	40.4
3/8"	9.2	78.0	100.0	55.1	4.4	44.9
#4	4.2	27.2	99.3	44.5	10.7	55.5
#8	2.9	6.8	85.3	35.2	9.2	64.8
#16	2.0	2.0	68.8	27.7	7.5	72.3
#30	1.6	1.3	50.3	20.3	7.4	79.7
#50	1.5	1.1	20.3	8.7	11.6	91.3
#100	1.4	1.0	3.8	2.3	6.4	97.7
LBW	1.3	0.8	0.3	0.8	1.4	99.2

*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:	69	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"	85.5	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: 6/22/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	970	5.93	2.62	31.6
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



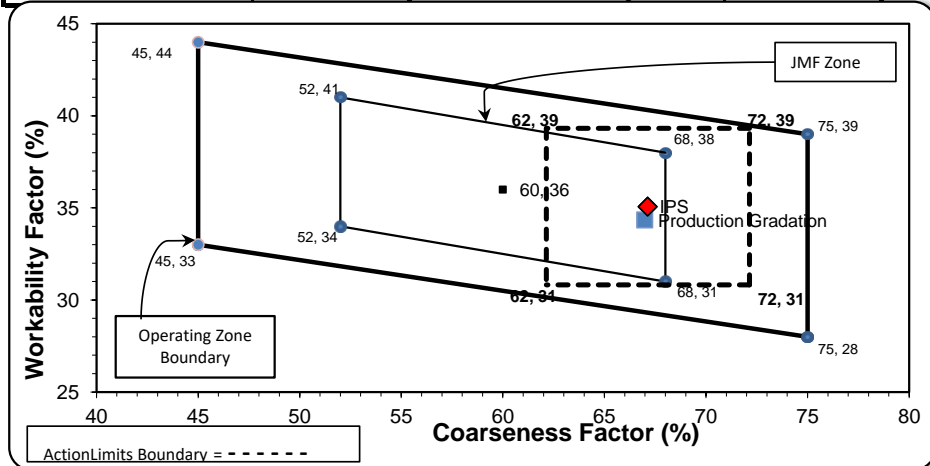
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 Suite 500
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	41.2	100.0	100.0	83.7	15.2	16.3
3/4"	13.0	97.4	100.0	75.1	8.6	24.9
1/2"	3.4	71.8	100.0	64.3	10.7	35.7
3/8"	2.8	46.0	100.0	56.0	8.3	44.0
#4	2.5	8.2	98.0	43.2	12.8	56.8
#8	2.3	4.0	79.7	34.4	8.8	65.6
#16	2.1	2.6	62.9	27.0	7.3	73.0
#30	2.0	2.2	46.8	20.3	6.7	79.7
#50	1.9	2.0	22.4	10.3	10.0	89.7
#100	1.9	1.8	4.4	2.9	7.4	97.1
LBW	1.7	1.6	0.5	1.2	1.7	98.8

*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:** **34**



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

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 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 6/22/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
2NS	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



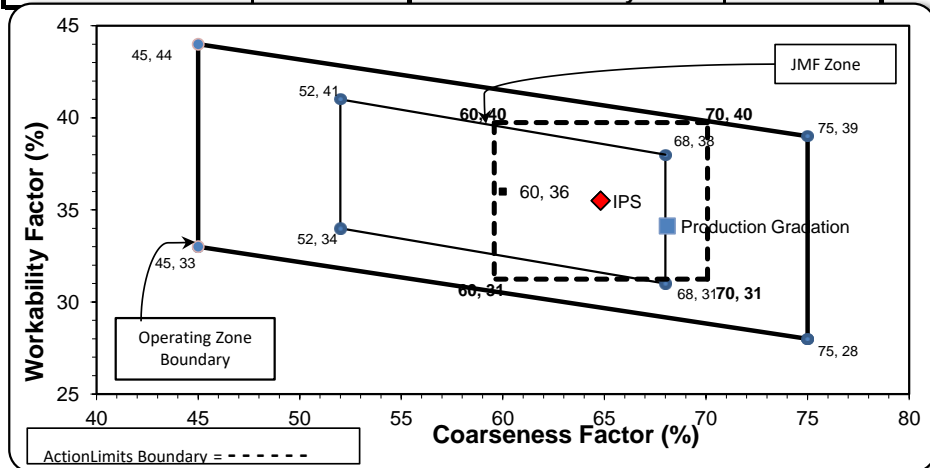
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	41.2	100.0	100.0	83.7	15.2	16.3
3/4"	13.0	97.4	100.0	75.0	8.7	25.0
1/2"	3.4	71.8	100.0	63.9	11.2	36.1
3/8"	2.8	46.0	100.0	55.1	8.7	44.9
#4	2.5	8.2	97.0	41.3	13.8	58.7
#8	2.3	4.0	82.3	34.1	7.2	65.9
#16	2.1	2.6	65.8	27.2	7.0	72.8
#30	2.0	2.2	46.1	19.3	7.9	80.7
#50	1.9	2.0	21.1	9.4	9.9	90.6
#100	1.9	1.8	5.7	3.4	6.1	96.6
LBW	1.7	1.6	1.5	1.6	1.8	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
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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

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 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 6/22/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



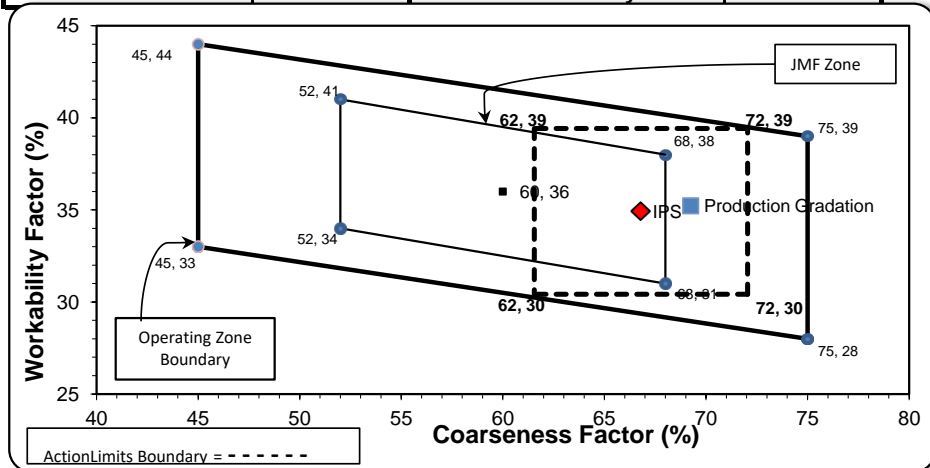
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	41.2	100.0	100.0	83.7	15.2	16.3
3/4"	13.0	97.4	100.0	75.0	8.7	25.0
1/2"	3.4	71.8	100.0	63.9	11.2	36.1
3/8"	2.8	46.0	100.0	55.1	8.7	44.9
#4	2.5	8.2	97.4	41.5	13.7	58.5
#8	2.3	4.0	85.1	35.2	6.3	64.8
#16	2.1	2.6	70.3	28.9	6.3	71.1
#30	2.0	2.2	48.3	20.2	8.8	79.8
#50	1.9	2.0	19.1	8.7	11.5	91.3
#100	1.9	1.8	2.2	2.0	6.7	98.0
LBW	1.7	1.6	0.4	1.2	0.8	98.8

*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:	69	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: 6/22/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

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%



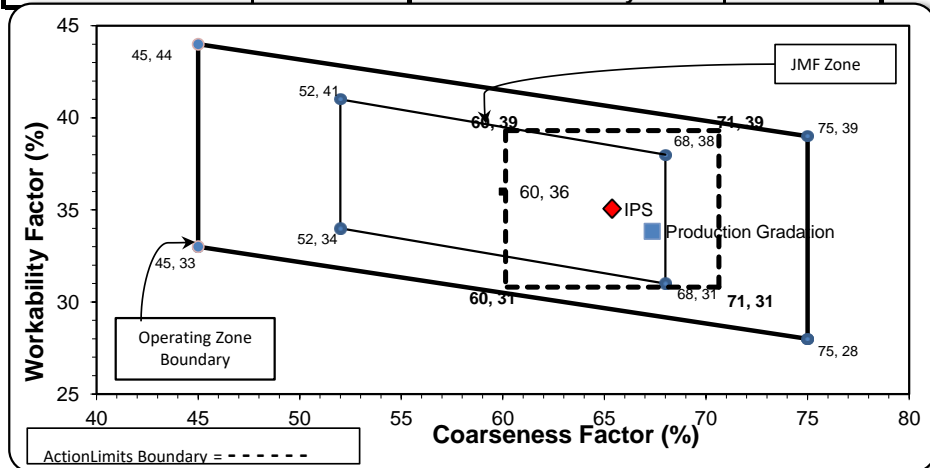
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 Suite 500
 Farmington Hills, MI 48336

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"	49.9	100.0	100.0	83.7	16.3	16.3
3/4"	16.4	99.0	100.0	72.5	11.2	27.5
1/2"	3.4	81.2	100.0	63.3	9.2	36.7
3/8"	2.3	54.0	100.0	55.4	7.9	44.6
#4	1.7	10.7	95.4	41.4	14.0	58.6
#8	1.5	4.2	81.0	33.8	7.6	66.2
#16	1.4	2.8	65.6	27.3	6.5	72.7
#30	1.4	2.5	49.2	20.7	6.6	79.3
#50	1.3	2.4	24.4	10.8	9.9	89.2
#100	1.3	2.3	7.4	4.0	6.8	96.0
LBW	1.1	2.1	1.1	1.4	2.6	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: **67** **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: 6/22/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/23/2020 through 6/29/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	970	5.93	2.62	31.6
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



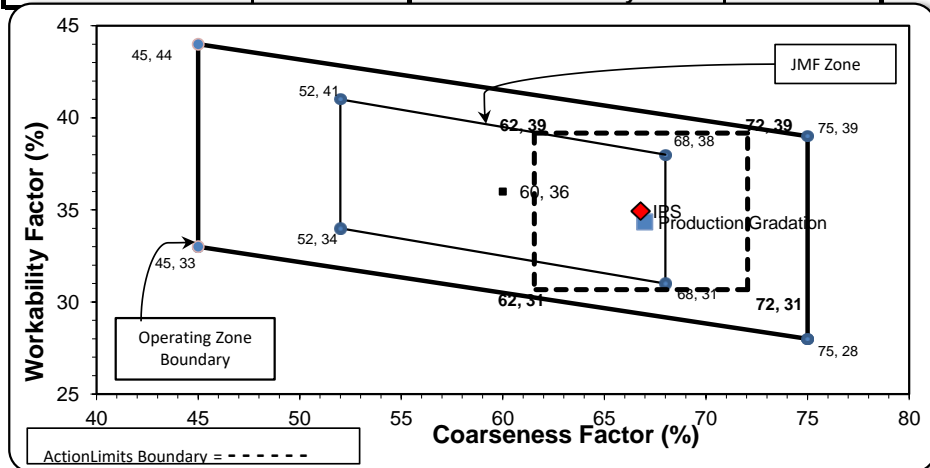
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	41.2	100.0	100.0	83.7	15.2	16.3
3/4"	13.0	97.4	100.0	75.1	8.6	24.9
1/2"	3.4	71.8	100.0	64.3	10.7	35.7
3/8"	2.8	46.0	100.0	56.0	8.3	44.0
#4	2.5	8.2	98.0	43.2	12.8	56.8
#8	2.3	4.0	79.7	34.4	8.8	65.6
#16	2.1	2.6	62.9	27.0	7.3	73.0
#30	2.0	2.2	46.8	20.3	6.7	79.7
#50	1.9	2.0	22.4	10.3	10.0	89.7
#100	1.9	1.8	4.4	2.9	7.4	97.1
LBW	1.7	1.6	0.5	1.2	1.7	98.8

*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:	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"	85.0	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: