

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 5/18/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/19/2020 through 5/25/2020

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%



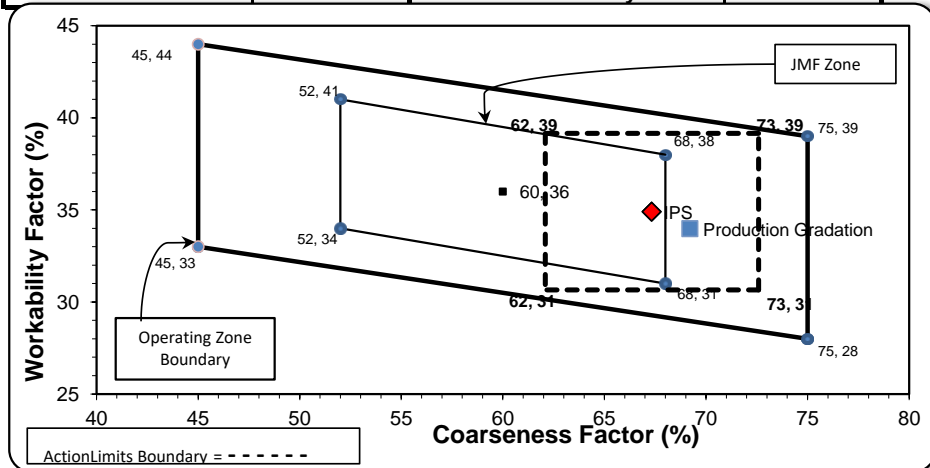
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	69.9	100.0	100.0	86.3	13.7	13.7
3/4"	43.2	100.0	100.0	74.1	12.2	25.9
1/2"	17.8	85.3	100.0	60.2	13.9	39.8
3/8"	10.1	70.2	100.0	54.3	5.9	45.7
#4	3.7	22.4	99.0	43.4	11.0	56.6
#8	2.8	6.8	82.2	34.0	9.4	66.0
#16	2.3	3.1	64.7	26.4	7.6	73.6
#30	2.2	2.3	47.1	19.5	6.9	80.5
#50	1.9	2.1	22.0	9.7	9.8	90.3
#100	1.9	1.9	4.5	2.9	6.8	97.1
LBW	1.8	1.6	0.5	1.3	1.6	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:	69	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: 5/18/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/19/2020 through 5/25/2020

MDOT No.: _____

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

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



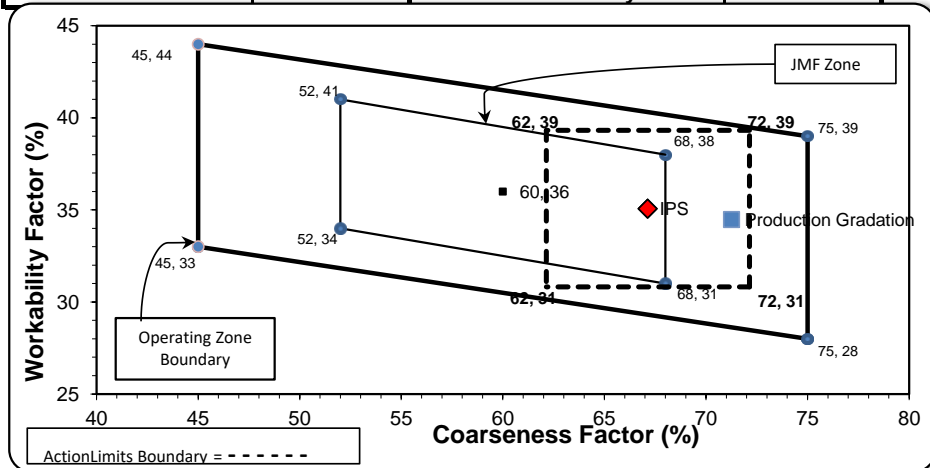
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 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.1	0.9	0.9
1"	53.8	100.0	100.0	85.4	13.7	14.6
3/4"	19.8	94.6	100.0	73.2	12.2	26.8
1/2"	7.0	65.6	100.0	61.1	12.1	38.9
3/8"	5.0	39.8	100.0	53.3	7.8	46.7
#4	3.3	8.2	98.3	43.3	10.0	56.7
#8	2.8	3.4	80.2	34.5	8.9	65.5
#16	2.5	2.6	62.4	26.9	7.6	73.1
#30	2.4	2.4	46.0	20.2	6.8	79.8
#50	2.2	2.2	23.6	10.9	9.2	89.1
#100	2.0	2.0	4.8	3.1	7.8	96.9
LBW	1.6	1.5	0.8	1.2	1.9	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: **71** **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

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: P-32

Contractor: _____

Sample Date: 5/18/20

Concrete Grade: P1M

Dates Test Represents: 5/19/2020 through 5/25/2020

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	1000	6.12	2.62	32.6
2NS	95-013	Smelter Bay	1270	7.68	2.65	41.4
Total Wt			3070	18.69		100.0

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



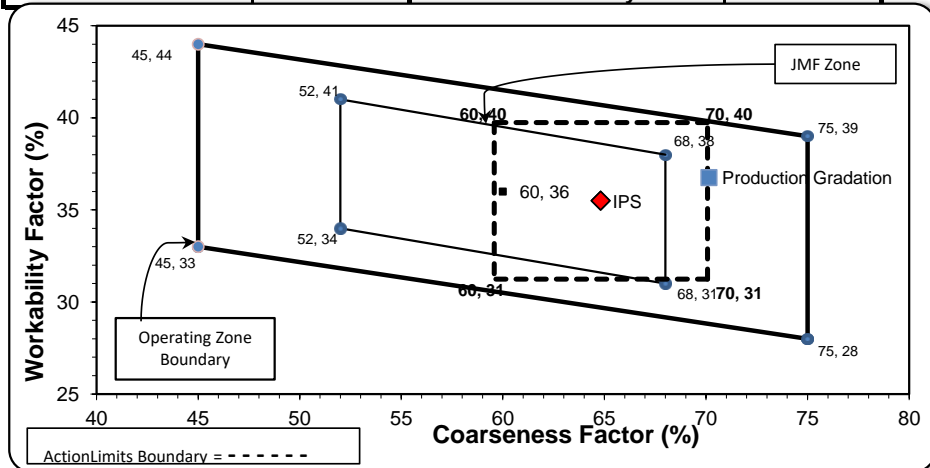
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.3	0.7	0.7
1"	53.8	100.0	100.0	88.0	11.3	12.0
3/4"	19.8	94.6	100.0	77.3	10.6	22.7
1/2"	7.0	65.6	100.0	64.6	12.8	35.4
3/8"	5.0	39.8	100.0	55.6	8.9	44.4
#4	3.3	8.2	96.5	43.5	12.2	56.5
#8	2.8	3.4	84.4	36.8	6.7	63.2
#16	2.5	2.6	69.7	30.3	6.4	69.7
#30	2.4	2.4	51.0	22.5	7.8	77.5
#50	2.2	2.2	22.8	10.7	11.8	89.3
#100	2.0	2.0	5.5	3.4	7.3	96.6
LBW	1.6	1.5	1.1	1.4	2.1	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:	70	Workability Factor:	37
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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: 5/18/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/19/2020 through 5/25/2020

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	1070	6.54	2.62	34.9
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



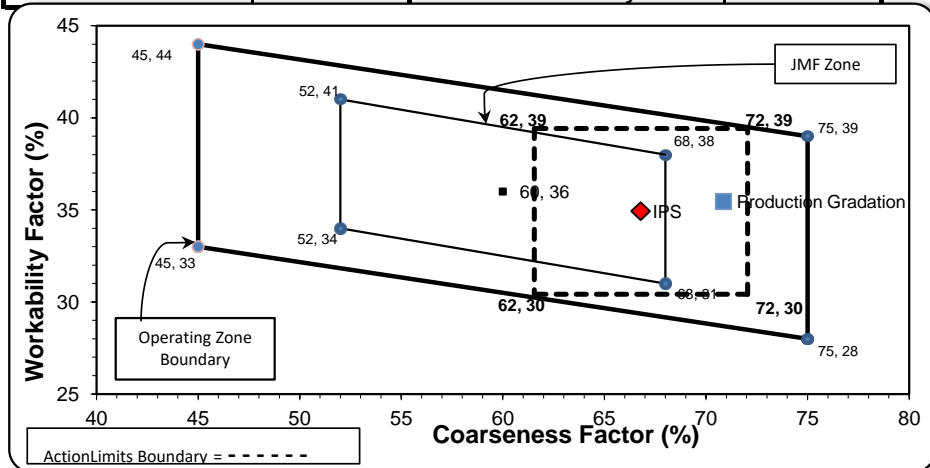
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.3	0.7	0.7
1"	53.8	100.0	100.0	88.0	11.3	12.0
3/4"	19.8	94.6	100.0	77.2	10.7	22.8
1/2"	7.0	65.6	100.0	63.8	13.4	36.2
3/8"	5.0	39.8	100.0	54.3	9.5	45.7
#4	3.3	8.2	97.8	41.9	12.3	58.1
#8	2.8	3.4	85.8	35.5	6.5	64.5
#16	2.5	2.6	71.4	29.5	6.0	70.5
#30	2.4	2.4	51.7	21.7	7.8	78.3
#50	2.2	2.2	23.3	10.4	11.2	89.6
#100	2.0	2.0	3.1	2.4	8.0	97.6
LBW	1.6	1.5	0.6	1.2	1.3	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:	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: 5/18/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/19/2020 through 5/25/2020

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%



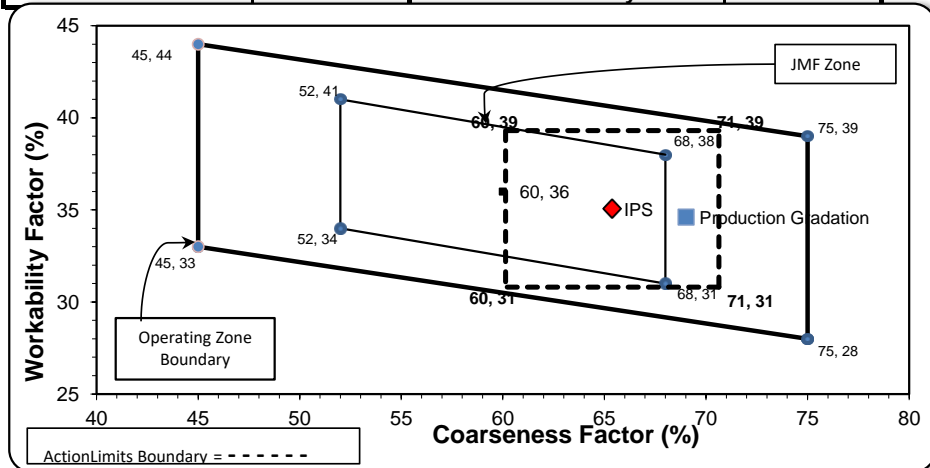
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 Farmington Hills, MI 48336

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"	44.8	100.0	100.0	82.0	18.0	18.0
3/4"	14.6	98.0	100.0	71.6	10.4	28.4
1/2"	3.4	77.8	100.0	62.4	9.2	37.6
3/8"	2.4	51.8	100.0	54.9	7.5	45.1
#4	1.9	12.7	96.2	42.4	12.5	57.6
#8	1.8	4.9	82.2	34.6	7.8	65.4
#16	1.7	3.1	66.4	27.8	6.8	72.2
#30	1.6	2.6	49.9	21.1	6.7	78.9
#50	1.6	2.4	22.6	10.2	10.9	89.8
#100	1.5	2.3	5.8	3.4	6.7	96.6
LBW	1.3	2.1	1.0	1.4	2.0	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:	69	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"	99.6	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: 5/18/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/19/2020 through 5/25/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



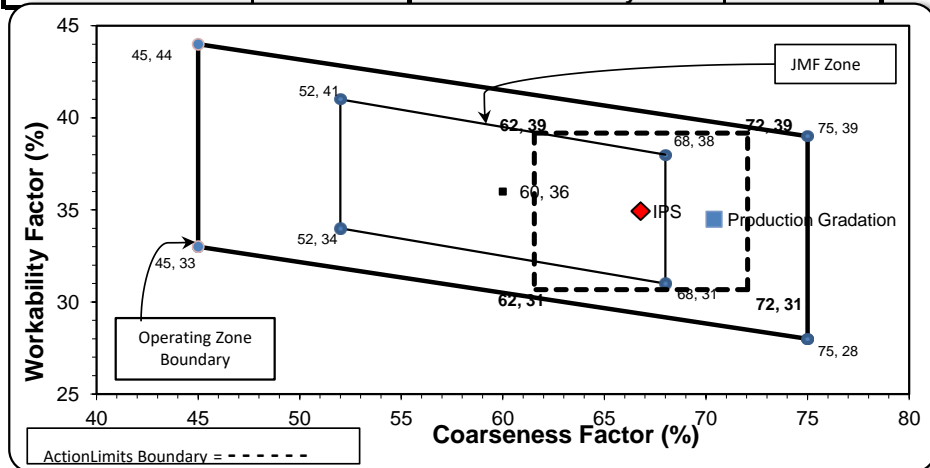
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.2	0.8	0.8
1"	53.8	100.0	100.0	86.2	13.0	13.8
3/4"	19.8	94.6	100.0	74.4	11.8	25.6
1/2"	7.0	65.6	100.0	62.0	12.3	38.0
3/8"	5.0	39.8	100.0	53.9	8.2	46.1
#4	3.3	8.2	98.3	43.4	10.5	56.6
#8	2.8	3.4	80.2	34.5	8.9	65.5
#16	2.5	2.6	62.4	26.9	7.6	73.1
#30	2.4	2.4	46.0	20.2	6.8	79.8
#50	2.2	2.2	23.6	10.9	9.2	89.1
#100	2.0	2.0	4.8	3.1	7.8	96.9
LBW	1.6	1.5	0.8	1.2	1.9	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:	70	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: