

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 5/25/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/26/2020 through 6/1/2020

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%



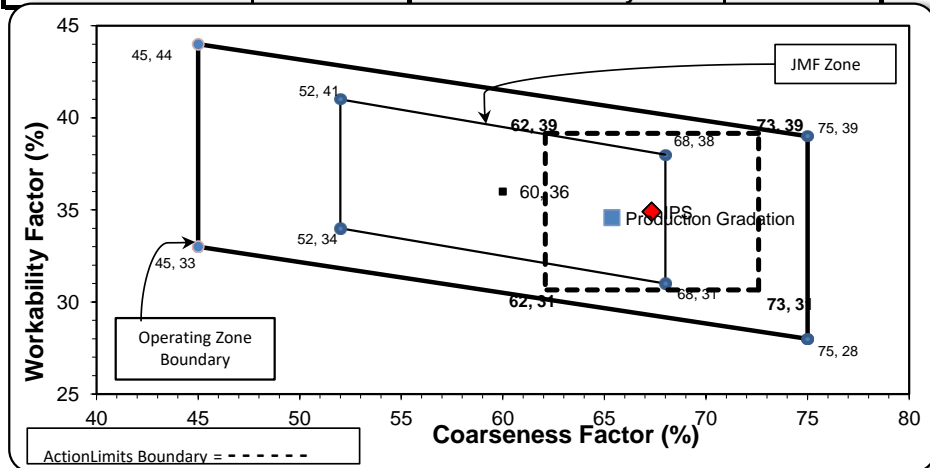
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	62.8	100.0	100.0	83.1	16.9	16.9
3/4"	40.2	100.0	100.0	72.8	10.3	27.2
1/2"	19.1	92.4	100.0	62.0	10.8	38.0
3/8"	12.3	82.2	100.0	57.2	4.7	42.8
#4	4.2	24.4	99.1	43.9	13.3	56.1
#8	2.8	6.7	83.8	34.6	9.4	65.4
#16	2.2	2.7	66.7	27.1	7.5	72.9
#30	1.8	2.1	49.9	20.3	6.7	79.7
#50	1.8	2.0	23.8	10.3	10.1	89.7
#100	1.7	1.9	4.8	2.9	7.4	97.1
LBW	1.6	1.5	0.4	1.1	1.8	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:	65	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

Contractor: _____

Sample Date: 5/25/20

Concrete Grade: P1M

Dates Test Represents: 5/26/2020 through 6/1/2020

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%



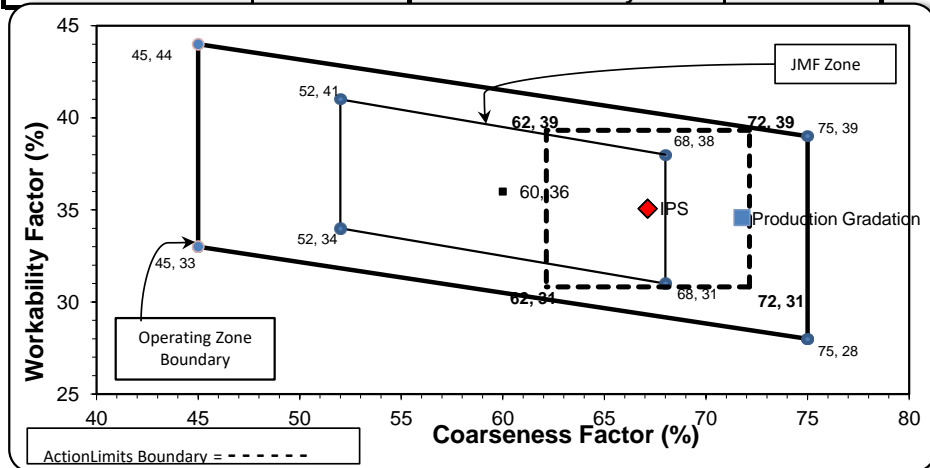
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.6	0.4	0.4
1"	45.9	100.0	100.0	84.1	15.4	15.9
3/4"	11.2	96.1	100.0	72.8	11.3	27.2
1/2"	3.1	66.1	100.0	61.4	11.4	38.6
3/8"	2.6	38.6	100.0	53.0	8.4	47.0
#4	2.3	7.5	98.3	42.9	10.1	57.1
#8	2.1	3.4	80.9	34.6	8.4	65.4
#16	2.0	2.5	64.3	27.5	7.1	72.5
#30	2.0	2.1	48.1	20.8	6.7	79.2
#50	1.9	2.0	24.3	11.1	9.7	88.9
#100	1.7	1.8	5.3	3.2	7.9	96.8
LBW	1.2	1.5	0.7	1.1	2.1	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



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

Approved By:

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 5/25/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/26/2020 through 6/1/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	725	4.43	2.62	23.6
IA	71-47	Presque Isle	1050	6.42	2.62	34.1
2NS	95-013	Smelter Bay	1300	7.86	2.65	42.3
Total Wt			3075	18.72		100.0

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



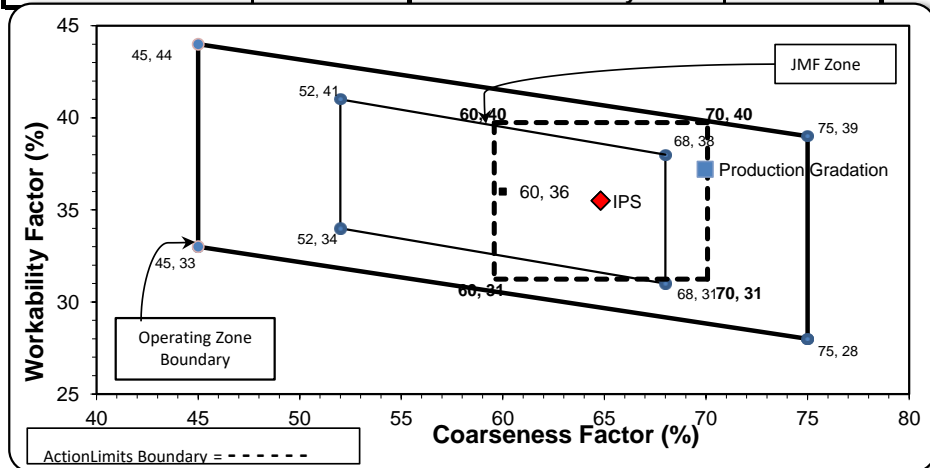
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.7	0.3	0.3
1"	45.9	100.0	100.0	87.2	12.4	12.8
3/4"	11.2	96.1	100.0	77.7	9.5	22.3
1/2"	3.1	66.1	100.0	65.6	12.2	34.4
3/8"	2.6	38.6	100.0	56.1	9.5	43.9
#4	2.3	7.5	96.7	44.0	12.1	56.0
#8	2.1	3.4	84.1	37.2	6.8	62.8
#16	2.0	2.5	66.2	29.3	7.9	70.7
#30	2.0	2.1	42.6	19.2	10.1	80.8
#50	1.9	2.0	16.7	8.2	11.0	91.8
#100	1.7	1.8	3.6	2.5	5.7	97.5
LBW	1.2	1.5	0.7	1.1	1.4	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:	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

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 5/25/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/26/2020 through 6/1/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	775	4.74	2.62	25.2
IA	71-47	Presque Isle	1095	6.70	2.62	35.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



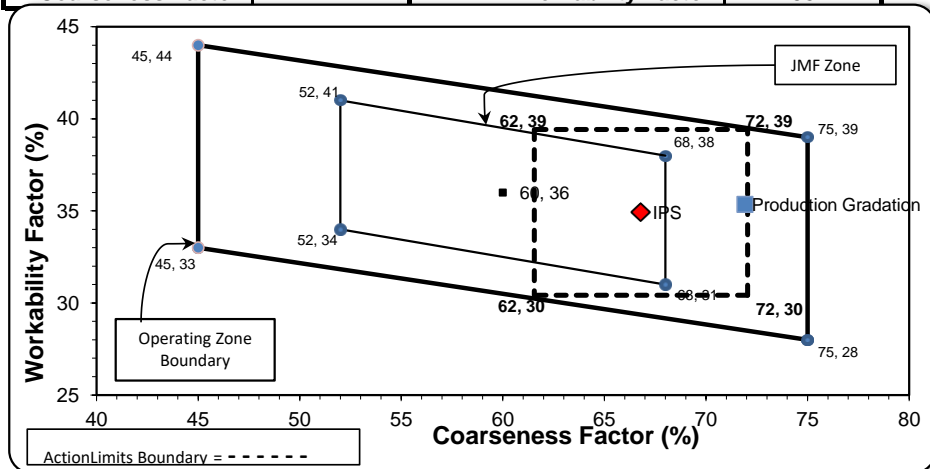
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.6	0.4	0.4
1"	45.9	100.0	100.0	86.3	13.3	13.7
3/4"	11.2	96.1	100.0	76.2	10.2	23.8
1/2"	3.1	66.1	100.0	63.4	12.7	36.6
3/8"	2.6	38.6	100.0	53.5	9.9	46.5
#4	2.3	7.5	97.6	41.4	12.1	58.6
#8	2.1	3.4	86.0	35.4	6.0	64.6
#16	2.0	2.5	72.0	29.5	5.8	70.5
#30	2.0	2.1	51.8	21.5	8.0	78.5
#50	1.9	2.0	22.9	10.1	11.4	89.9
#100	1.7	1.8	3.0	2.2	7.9	97.8
LBW	1.2	1.5	0.5	1.0	1.2	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:	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"	72.1	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: 5/25/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/26/2020 through 6/1/2020

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%



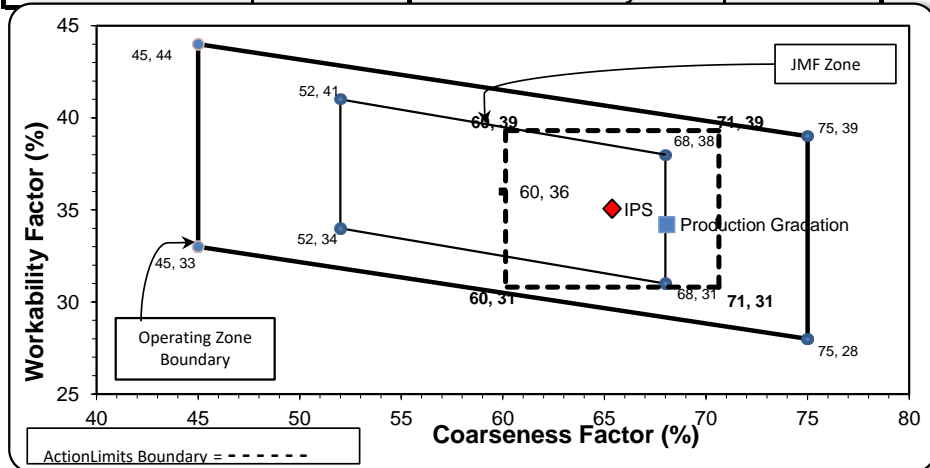
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	43.6	100.0	100.0	81.6	18.4	18.4
3/4"	14.3	98.6	100.0	71.7	9.9	28.3
1/2"	3.3	77.8	100.0	62.4	9.3	37.6
3/8"	2.2	53.3	100.0	55.2	7.1	44.8
#4	1.8	13.4	95.4	42.2	13.0	57.8
#8	1.6	5.1	81.2	34.2	8.0	65.8
#16	1.5	3.2	66.3	27.7	6.5	72.3
#30	1.5	2.8	50.6	21.4	6.3	78.6
#50	1.4	2.6	25.1	11.2	10.2	88.8
#100	1.4	2.4	7.5	4.1	7.0	95.9
LBW	1.2	2.1	0.8	1.3	2.8	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:	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"	99.6	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: 5/25/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/26/2020 through 6/1/2020

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%



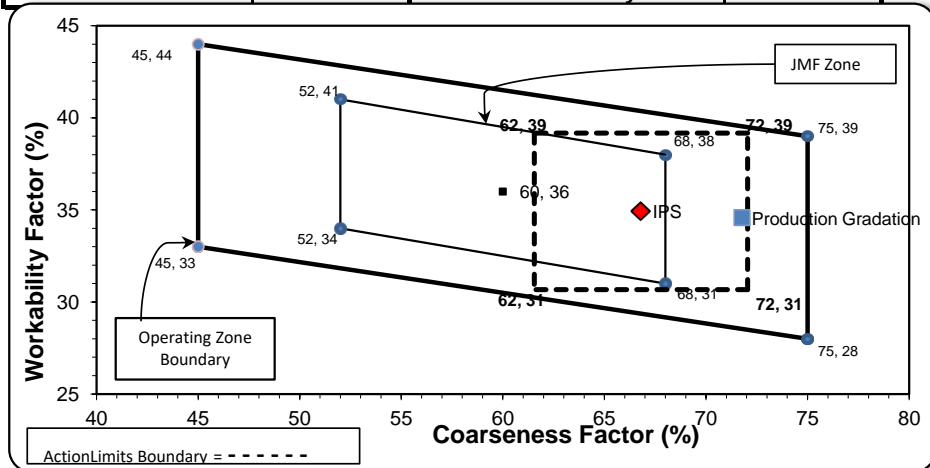
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	45.9	100.0	100.0	84.1	15.4	15.9
3/4"	11.2	96.1	100.0	72.8	11.3	27.2
1/2"	3.1	66.1	100.0	61.4	11.4	38.6
3/8"	2.6	38.6	100.0	53.0	8.4	47.0
#4	2.3	7.5	98.3	42.9	10.1	57.1
#8	2.1	3.4	80.9	34.6	8.4	65.4
#16	2.0	2.5	64.3	27.5	7.1	72.5
#30	2.0	2.1	48.1	20.8	6.7	79.2
#50	1.9	2.0	24.3	11.1	9.7	88.9
#100	1.7	1.8	5.3	3.2	7.9	96.8
LBW	1.2	1.5	0.7	1.1	2.1	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"	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: