

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/26/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

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	900	5.50	2.62	29.3
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"	96.4	100.0	100.0	98.9	1.1	1.1
1"	44.5	100.0	100.0	82.5	16.4	17.5
3/4"	14.6	98.8	100.0	72.7	9.8	27.3
1/2"	5.0	84.3	100.0	65.4	7.3	34.6
3/8"	3.5	61.8	100.0	58.3	7.1	41.7
#4	2.6	13.7	97.6	43.0	15.3	57.0
#8	2.2	4.6	79.3	33.0	9.9	67.0
#16	2.0	2.6	61.7	25.5	7.5	74.5
#30	1.9	2.2	45.9	19.2	6.3	80.8
#50	1.9	2.1	22.7	10.1	9.1	89.9
#100	1.8	2.0	4.5	2.9	7.2	97.1
LBW	1.6	1.8	0.7	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

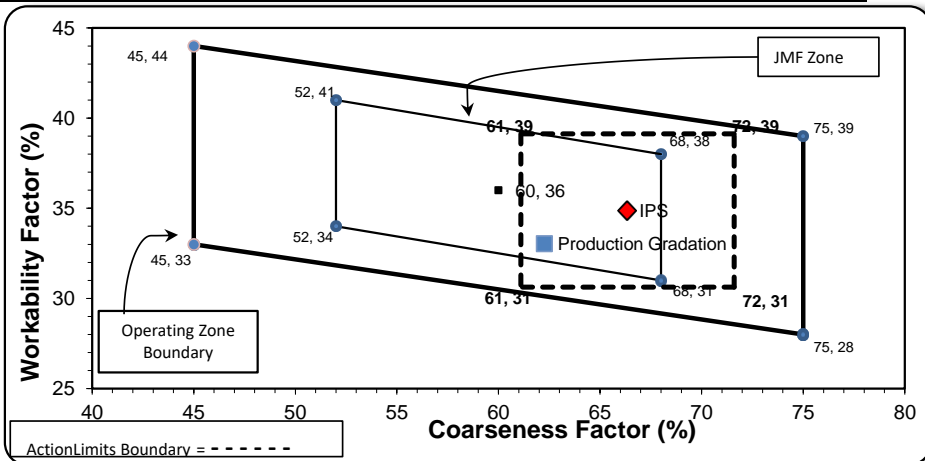
Coarseness Factor:	62	Workability Factor:	33
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Initial Production Sample (IPS)

Coarseness Factor:	66
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Workability Factor:	35
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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-20**

Sample Date: 10/26/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

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	920	5.63	2.62	30.0
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



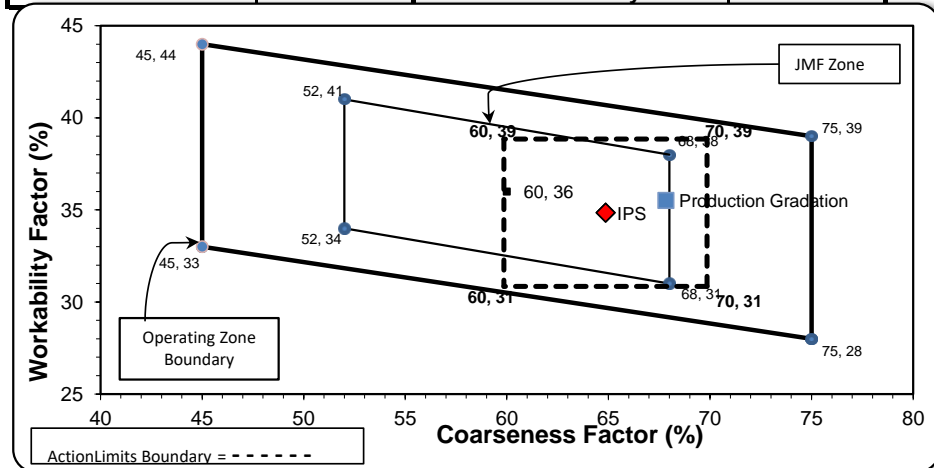
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	42.3	100.0	100.0	82.1	17.9	17.9
3/4"	14.1	99.6	100.0	73.3	8.8	26.7
1/2"	3.4	77.3	100.0	63.3	10.0	36.7
3/8"	2.9	54.3	100.0	56.3	7.0	43.7
#4	2.6	9.8	97.6	41.9	14.4	58.1
#8	2.5	4.0	85.8	35.5	6.4	64.5
#16	2.4	2.9	70.9	29.3	6.2	70.7
#30	2.3	2.5	48.8	20.5	8.8	79.5
#50	2.2	2.3	18.0	8.4	12.1	91.6
#100	2.0	2.1	2.5	2.2	6.2	97.8
LBW	1.8	1.9	0.4	1.3	0.9	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:	36
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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"	99.1	0.9	0.9
1"	80.8	18.2	19.2
3/4"	71.3	9.6	28.7
1/2"	64.0	7.3	36.0
3/8"	57.7	6.2	42.3
#4	42.8	15.0	57.2
#8	34.8	7.9	65.2
#16	28.4	6.4	71.6
#30	20.2	8.2	79.8
#50	7.6	12.6	92.4
#100	1.6	6.0	98.4
LBW	1.0	0.6	99.0

PREPARED BY:
 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 10/26/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

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	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



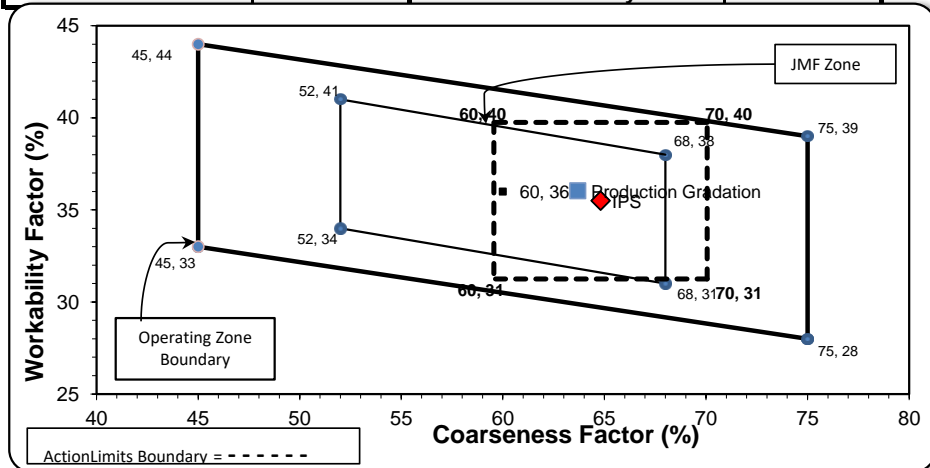
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.3	100.0	100.0	98.9	1.1	1.1
1"	42.5	100.0	100.0	82.8	16.1	17.2
3/4"	11.2	98.6	100.0	73.0	9.8	27.0
1/2"	4.2	80.9	100.0	65.7	7.3	34.3
3/8"	2.8	60.4	100.0	59.3	6.4	40.7
#4	2.2	15.2	96.0	44.2	15.1	55.8
#8	2.0	5.2	83.3	36.0	8.2	64.0
#16	1.9	3.2	67.1	28.8	7.2	71.2
#30	1.9	2.6	46.7	20.3	8.5	79.7
#50	1.7	2.4	22.1	10.2	10.1	89.8
#100	1.6	2.1	6.1	3.6	6.6	96.4
LBW	1.4	1.8	1.0	1.4	2.2	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: **64** **Workability Factor:** **36**



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"	99.0	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

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Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 10/26/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

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	920	5.63	2.62	30.0
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



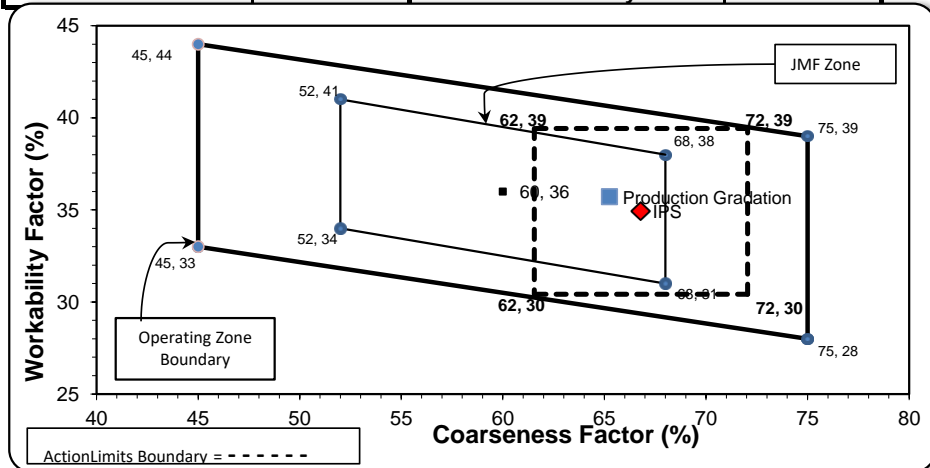
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.3	100.0	100.0	98.9	1.1	1.1
1"	42.5	100.0	100.0	82.2	16.6	17.8
3/4"	11.2	98.6	100.0	72.1	10.1	27.9
1/2"	4.2	80.9	100.0	64.6	7.5	35.4
3/8"	2.8	60.4	100.0	58.1	6.6	41.9
#4	2.2	15.2	97.6	43.4	14.7	56.6
#8	2.0	5.2	85.8	35.7	7.7	64.3
#16	1.9	3.2	70.9	29.3	6.5	70.7
#30	1.9	2.6	48.8	20.4	8.8	79.6
#50	1.7	2.4	18.0	8.3	12.2	91.7
#100	1.6	2.1	2.5	2.1	6.2	97.9
LBW	1.4	1.8	0.4	1.1	1.0	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:	65	Workability Factor:	36
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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

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Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 10/26/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

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	900	5.50	2.62	29.3
2NS	44-051	Krake Willis Rd	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



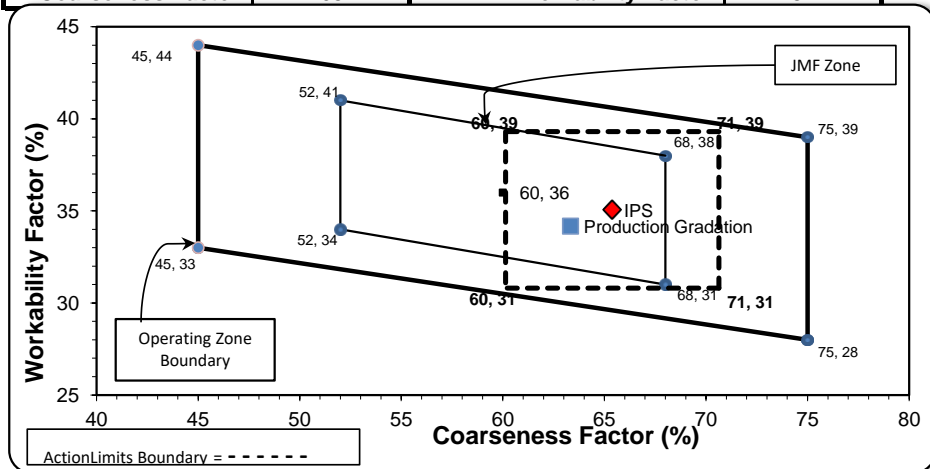
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.4	100.0	100.0	98.9	1.1	1.1
1"	44.5	100.0	100.0	82.5	16.4	17.5
3/4"	14.6	98.8	100.0	72.7	9.8	27.3
1/2"	5.0	84.3	100.0	65.4	7.3	34.6
3/8"	3.5	61.8	100.0	58.3	7.1	41.7
#4	2.6	13.7	96.2	42.4	15.9	57.6
#8	2.2	4.6	82.2	34.2	8.3	65.8
#16	2.0	2.6	66.8	27.5	6.7	72.5
#30	1.9	2.2	52.2	21.6	5.9	78.4
#50	1.9	2.1	26.3	11.5	10.2	88.5
#100	1.8	2.0	7.1	3.9	7.6	96.1
LBW	1.6	1.8	0.8	1.3	2.6	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:	63	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: 10/26/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

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%



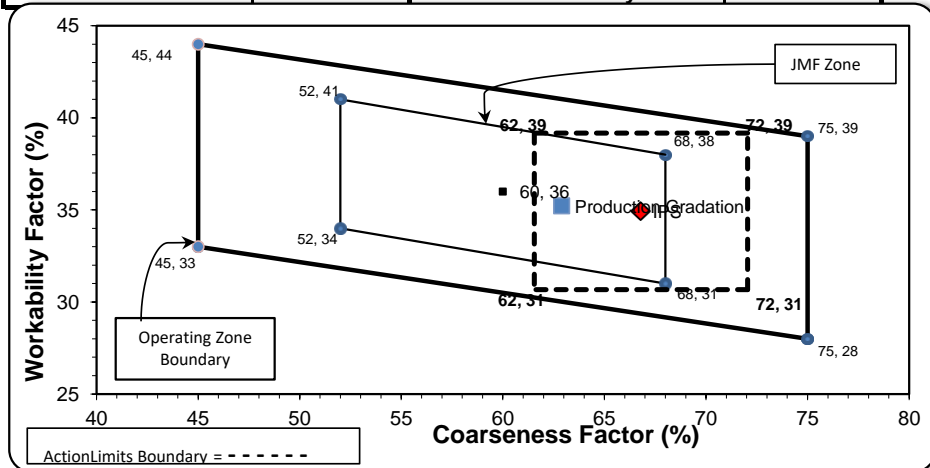
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.3	100.0	100.0	98.9	1.1	1.1
1"	42.5	100.0	100.0	82.8	16.1	17.2
3/4"	11.2	98.6	100.0	73.0	9.8	27.0
1/2"	4.2	80.9	100.0	65.7	7.3	34.3
3/8"	2.8	60.4	100.0	59.3	6.4	40.7
#4	2.2	15.2	98.0	45.0	14.2	55.0
#8	2.0	5.2	81.3	35.2	9.8	64.8
#16	1.9	3.2	64.6	27.8	7.4	72.2
#30	1.9	2.6	48.2	21.0	6.9	79.0
#50	1.7	2.4	21.8	10.1	10.9	89.9
#100	1.6	2.1	3.6	2.6	7.5	97.4
LBW	1.4	1.8	0.3	1.1	1.5	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:	63	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: