

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 5/11/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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%



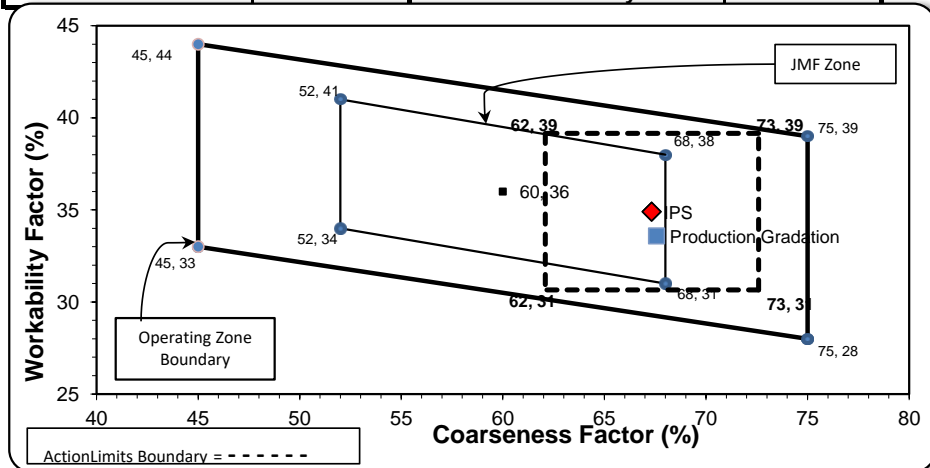
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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"	66.5	100.0	100.0	84.8	15.2	15.2
3/4"	44.5	100.0	100.0	74.7	10.0	25.3
1/2"	19.4	89.0	100.0	61.6	13.2	38.4
3/8"	10.2	75.0	100.0	55.1	6.4	44.9
#4	4.4	25.3	99.1	44.2	11.0	55.8
#8	2.8	7.2	81.0	33.6	10.6	66.4
#16	2.1	3.0	61.8	25.2	8.4	74.8
#30	1.8	2.2	43.6	17.9	7.3	82.1
#50	1.6	1.8	18.2	8.0	9.9	92.0
#100	1.6	1.7	3.5	2.3	5.7	97.7
LBW	1.4	1.4	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:	68	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: 5/11/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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%



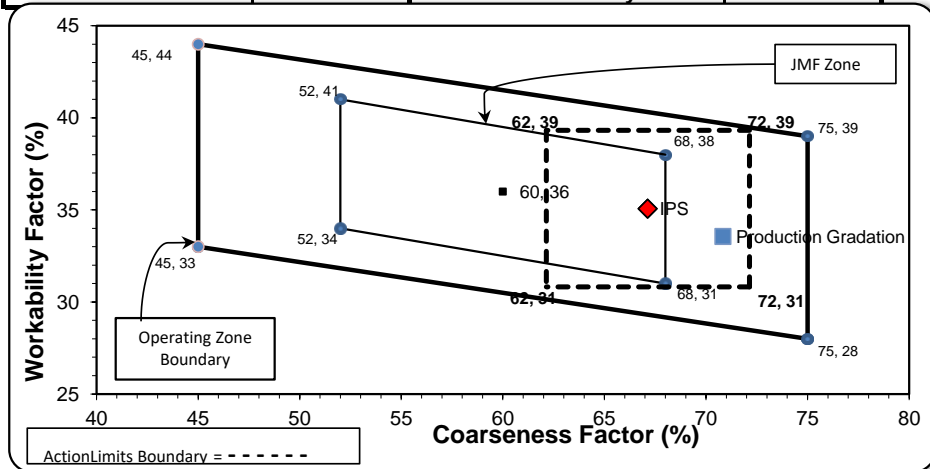
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 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.5	0.5	0.5
1"	48.8	100.0	100.0	83.8	15.7	16.2
3/4"	15.0	95.9	100.0	72.0	11.8	28.0
1/2"	3.4	68.1	100.0	60.6	11.4	39.4
3/8"	2.5	41.3	100.0	52.9	7.7	47.1
#4	2.2	8.2	98.4	43.0	9.9	57.0
#8	2.0	2.9	78.9	33.6	9.5	66.4
#16	1.9	2.2	61.0	26.0	7.5	74.0
#30	1.8	2.0	45.6	19.7	6.4	80.3
#50	1.7	1.9	23.4	10.6	9.1	89.4
#100	1.6	1.8	4.5	2.8	7.8	97.2
LBW	1.3	1.4	0.9	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:	71	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"	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: 5/11/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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%



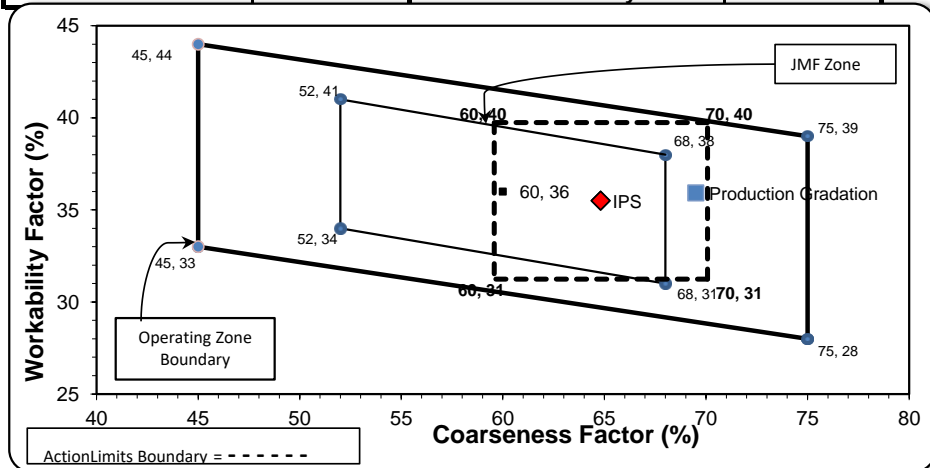
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.6	0.4	0.4
1"	48.8	100.0	100.0	86.7	12.9	13.3
3/4"	15.0	95.9	100.0	76.5	10.1	23.5
1/2"	3.4	68.1	100.0	64.4	12.1	35.6
3/8"	2.5	41.3	100.0	55.5	9.0	44.5
#4	2.2	8.2	95.4	42.7	12.8	57.3
#8	2.0	2.9	83.3	35.9	6.8	64.1
#16	1.9	2.2	68.4	29.5	6.4	70.5
#30	1.8	2.0	48.8	21.3	8.2	78.7
#50	1.7	1.9	21.6	10.0	11.3	90.0
#100	1.6	1.8	5.5	3.3	6.7	96.7
LBW	1.3	1.4	1.5	1.4	1.9	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:** **36**



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: 5/11/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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



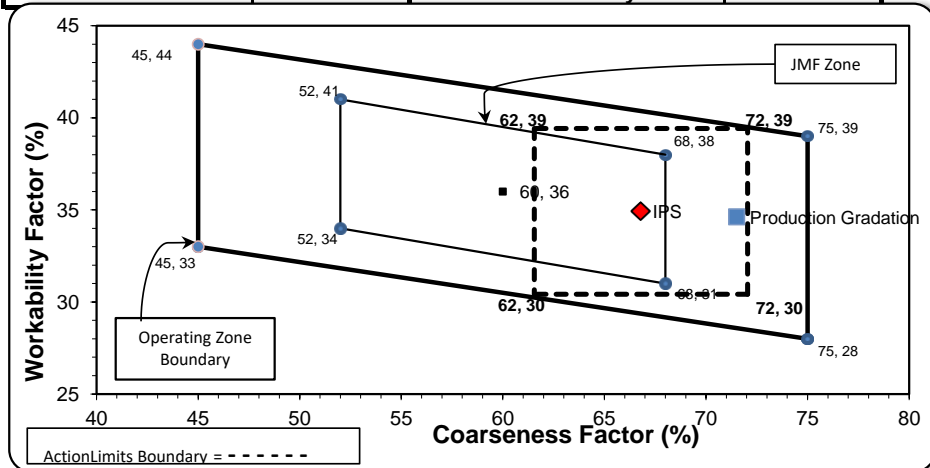
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.5	0.5	0.5
1"	48.8	100.0	100.0	85.5	14.1	14.5
3/4"	15.0	95.9	100.0	74.6	10.9	25.4
1/2"	3.4	68.1	100.0	62.2	12.3	37.8
3/8"	2.5	41.3	100.0	53.2	9.0	46.8
#4	2.2	8.2	97.3	41.3	11.9	58.7
#8	2.0	2.9	84.7	34.6	6.7	65.4
#16	1.9	2.2	69.7	28.5	6.1	71.5
#30	1.8	2.0	50.9	21.1	7.4	78.9
#50	1.7	1.9	23.3	10.2	10.8	89.8
#100	1.6	1.8	3.2	2.3	7.9	97.7
LBW	1.3	1.4	0.5	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:	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"	72.1	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: 5/11/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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%



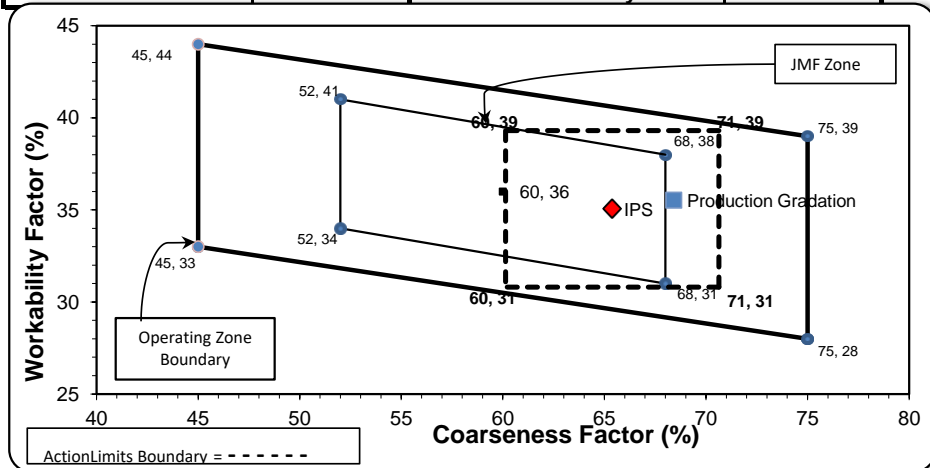
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	46.3	100.0	100.0	82.5	17.5	17.5
3/4"	15.5	98.9	100.0	72.2	10.3	27.8
1/2"	3.4	79.1	100.0	62.7	9.4	37.3
3/8"	2.5	55.4	100.0	55.9	6.9	44.1
#4	2.0	12.2	97.6	42.8	13.1	57.2
#8	1.8	4.5	84.8	35.5	7.3	64.5
#16	1.8	2.8	70.0	29.2	6.4	70.8
#30	1.7	2.4	51.0	21.5	7.7	78.5
#50	1.7	2.1	23.4	10.4	11.1	89.6
#100	1.6	2.0	3.8	2.6	7.8	97.4
LBW	1.4	1.8	0.7	1.2	1.4	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:	68	Workability Factor:	36
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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: 5/11/20

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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%



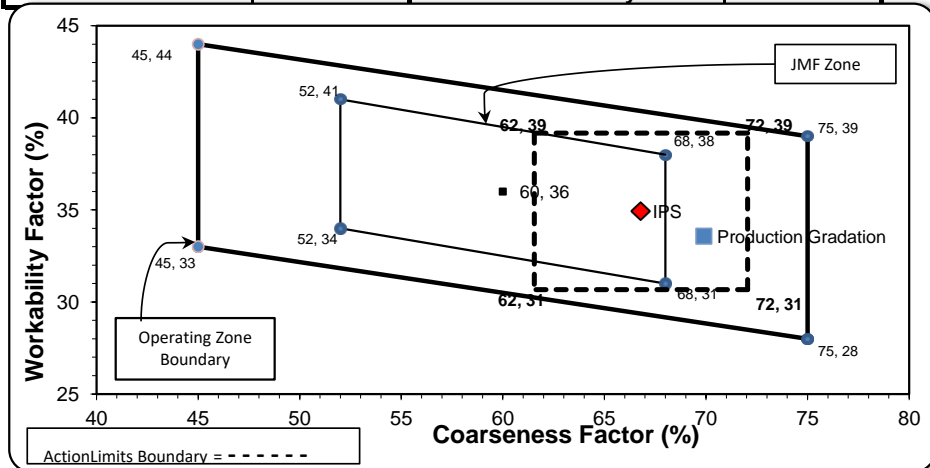
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.5	0.5	0.5
1"	48.8	100.0	100.0	84.7	14.9	15.3
3/4"	15.0	95.9	100.0	73.3	11.3	26.7
1/2"	3.4	68.1	100.0	61.7	11.6	38.3
3/8"	2.5	41.3	100.0	53.6	8.1	46.4
#4	2.2	8.2	98.4	43.1	10.4	56.9
#8	2.0	2.9	78.9	33.6	9.6	66.4
#16	1.9	2.2	61.0	26.1	7.5	73.9
#30	1.8	2.0	45.6	19.7	6.4	80.3
#50	1.7	1.9	23.4	10.6	9.1	89.4
#100	1.6	1.8	4.5	2.8	7.8	97.2
LBW	1.3	1.4	0.9	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:	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: