

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-103**

Sample Date: 8/14/17

Concrete Grade: DM

Contractor: \_\_\_\_\_

Dates Test Represents: 8/14/2017 to 8/20/2017

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	51.8
26A	58-003	Stoneco	200	1.19	2.69	6.7
2NS	81-93	Burmeister	1240	7.53	2.64	41.5
<b>Total Wt</b>			<b>2990</b>	<b>17.95</b>		<b>100.0</b>

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

Sieve	6AA	26A	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"	99.6	100.0	100.0	99.8	0.2	0.2
3/4"	87.4	100.0	100.0	93.5	6.3	6.5
1/2"	52.0	100.0	100.0	75.1	18.4	24.9
3/8"	28.4	89.9	100.0	62.2	12.9	37.8
#4	3.8	26.0	97.4	44.1	18.1	55.9
#8	1.4	5.3	83.4	35.7	8.4	64.3
#16	1.1	2.7	68.0	29.0	6.7	71.0
#30	0.9	2.1	49.0	20.9	8.0	79.1
#50	0.9	1.9	19.0	8.5	12.5	91.5
#100	0.8	1.7	2.9	1.7	6.7	98.3
LBW	0.7	1.6	0.8	0.8	0.9	99.2

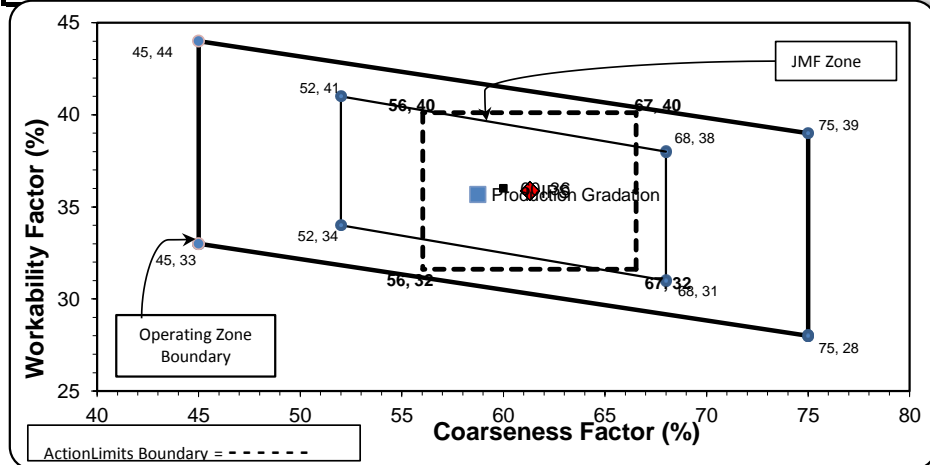


**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

\*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: 59**      **Workability Factor: 36**



Initial Production Sample (IPS)

Coarseness Factor: 61		Workability Factor: 36	
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:  
 SM, LLC Technical Service

Approved BY:

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-32**

Sample Date: 8/14/17

Concrete Grade: DM

Contractor: \_\_\_\_\_

Dates Test Represents: 8/14/2017 to 8/20/2017

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	52.5
26A	71-47	Presque Isle	200	1.22	2.62	6.8
2NS	95-13	Smelter Bay	1200	7.26	2.65	40.7
<b>Total Wt</b>			<b>2950</b>	<b>17.96</b>		<b>100.0</b>

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

Sieve	6AA	26A	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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	88.3	100.0	100.0	93.9	6.1	6.1
1/2"	51.6	98.1	100.0	74.4	19.4	25.6
3/8"	29.4	86.9	100.0	62.0	12.4	38.0
#4	5.1	13.7	97.3	43.2	18.8	56.8
#8	2.2	2.8	87.5	36.9	6.2	63.1
#16	1.8	1.8	72.9	30.7	6.2	69.3
#30	1.7	1.7	51.9	22.1	8.6	77.9
#50	1.6	1.6	24.1	10.8	11.4	89.2
#100	1.4	1.6	7.0	3.7	7.1	96.3
LBW	1.3	1.5	1.8	1.5	2.2	98.5

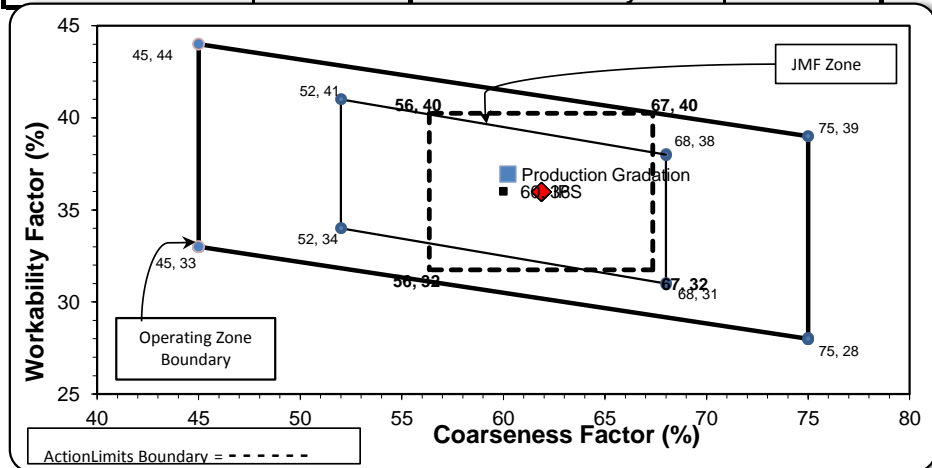


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 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

<b>Coarseness Factor:</b>	<b>60</b>	<b>Workability Factor:</b>	<b>37</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>62</b>		
<b>Workability Factor:</b>	<b>36</b>		
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-36**

Sample Date: 8/14/17

Concrete Grade: DM

Contractor: \_\_\_\_\_

Dates Test Represents: 8/14/2017 to 8/20/2017

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1630	9.71	2.69	54.5
26A	71-47	Presque Isle	150	0.92	2.62	5.0
2NS	63-92	AA Grange Hall	1210	7.32	2.65	40.5
<b>Total Wt</b>			<b>2990</b>	<b>17.95</b>		<b>100.0</b>

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

Sieve	6AA	26A	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"	99.6	100.0	100.0	99.8	0.2	0.2
3/4"	87.4	100.0	100.0	93.1	6.7	6.9
1/2"	52.0	98.1	100.0	73.7	19.4	26.3
3/8"	28.4	86.9	100.0	60.3	13.4	39.7
#4	3.8	13.7	98.5	42.6	17.7	57.4
#8	1.4	2.8	86.8	36.0	6.6	64.0
#16	1.1	1.8	70.1	29.1	7.0	70.9
#30	0.9	1.7	49.5	20.6	8.5	79.4
#50	0.9	1.6	21.2	9.2	11.5	90.8
#100	0.8	1.6	3.0	1.7	7.4	98.3
LBW	0.7	1.5	0.3	0.6	1.2	99.4

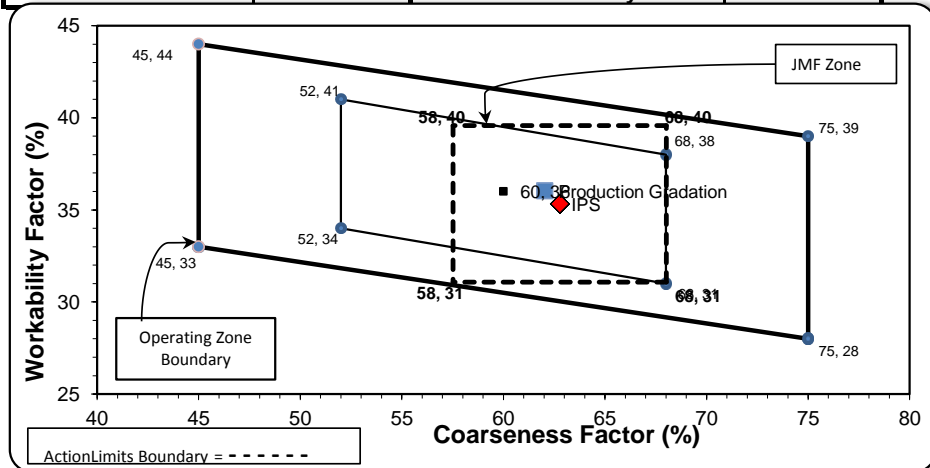
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Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **62**      Workability Factor: **36**



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"	99.9	0.1	0.1
3/4"	89.1	10.8	10.9
1/2"	71.3	17.8	28.7
3/8"	59.4	11.9	40.6
#4	42.6	16.8	57.4
#8	35.3	7.3	64.7
#16	28.5	6.8	71.5
#30	20.9	7.6	79.1
#50	9.0	12.0	91.0
#100	1.7	7.3	98.3
LBW	0.7	1.0	99.3

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# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-38**

Sample Date: 8/14/17

Concrete Grade: DM

Contractor: \_\_\_\_\_

Dates Test Represents: 8/14/2017 to 8/20/2017

MDOT No.: \_\_\_\_\_

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Sieve	6AA	26A	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"	99.6	100.0	100.0	99.8	0.2	0.2
3/4"	87.4	100.0	100.0	93.5	6.3	6.5
1/2"	52.0	100.0	100.0	75.1	18.4	24.9
3/8"	28.4	89.9	100.0	62.2	12.9	37.8
#4	3.8	26.0	97.4	44.1	18.1	55.9
#8	1.4	5.3	83.4	35.7	8.4	64.3
#16	1.1	2.7	68.0	29.0	6.7	71.0
#30	0.9	2.1	49.0	20.9	8.0	79.1
#50	0.9	1.9	19.0	8.5	12.5	91.5
#100	0.8	1.7	2.9	1.7	6.7	98.3
LBW	0.7	1.6	0.8	0.8	0.9	99.2

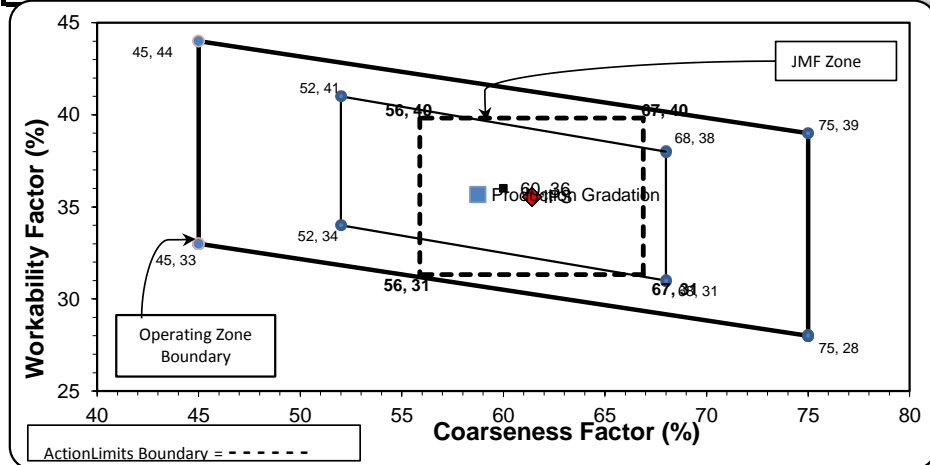


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Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

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1.5"	100.0	0.0	0.0
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1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
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#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

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