

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

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

Sample Date: 4/3/17

Concrete Grade: **DM**

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

Dates Test Represents: 4/3/2017 to 4/9/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1520	9.06	2.69	50.8
26A	58-003	Stoneco	250	1.49	2.69	8.4
2NS	81-93	Burmeister	1220	7.41	2.64	40.8
<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"	99.7	100.0	100.0	99.8	0.2	0.2
3/4"	80.2	100.0	100.0	89.9	9.9	10.1
1/2"	44.8	99.8	100.0	71.9	18.0	28.1
3/8"	25.5	89.3	100.0	61.2	10.7	38.8
#4	2.2	27.3	99.1	43.8	17.4	56.2
#8	1.0	5.1	84.7	35.5	8.3	64.5
#16	0.8	1.8	67.9	28.3	7.2	71.7
#30	0.8	1.3	46.9	19.7	8.6	80.3
#50	0.6	1.1	16.2	7.0	12.6	93.0
#100	0.6	1.0	2.3	1.3	5.7	98.7
LBW	0.6	0.8	0.9	0.7	0.6	99.3

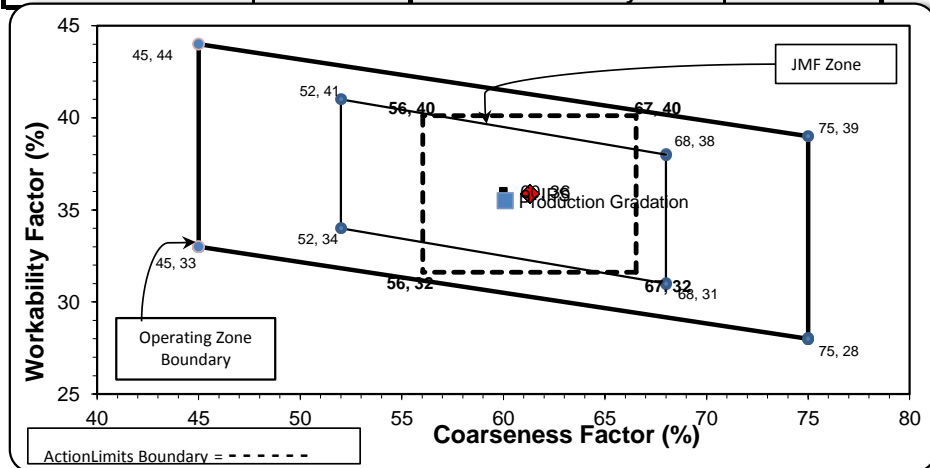


**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

\*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: 60**      **Workability Factor: 35**



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-36**

Sample Date: 4/3/17

Concrete Grade: **DM**

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

Dates Test Represents: 4/3/2017 to 4/9/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1530	9.11	2.69	51.2
26A	71-47	Presque Isle	230	1.41	2.62	7.7
2NS	63-115	Ray Road	1230	7.44	2.65	41.1
<b>Total Wt</b>			<b>2990</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"	99.7	100.0	100.0	99.8	0.2	0.2
3/4"	80.2	100.0	100.0	89.9	10.0	10.1
1/2"	44.8	95.3	100.0	71.4	18.5	28.6
3/8"	25.5	80.1	100.0	60.3	11.0	39.7
#4	2.2	14.2	96.7	42.0	18.3	58.0
#8	1.0	3.6	80.3	33.8	8.2	66.2
#16	0.8	1.8	62.0	26.1	7.8	73.9
#30	0.8	1.4	45.2	19.1	6.9	80.9
#50	0.6	1.3	21.6	9.3	9.8	90.7
#100	0.6	1.2	3.9	2.0	7.3	98.0
LBW	0.6	1.0	1.3	0.9	1.1	99.1

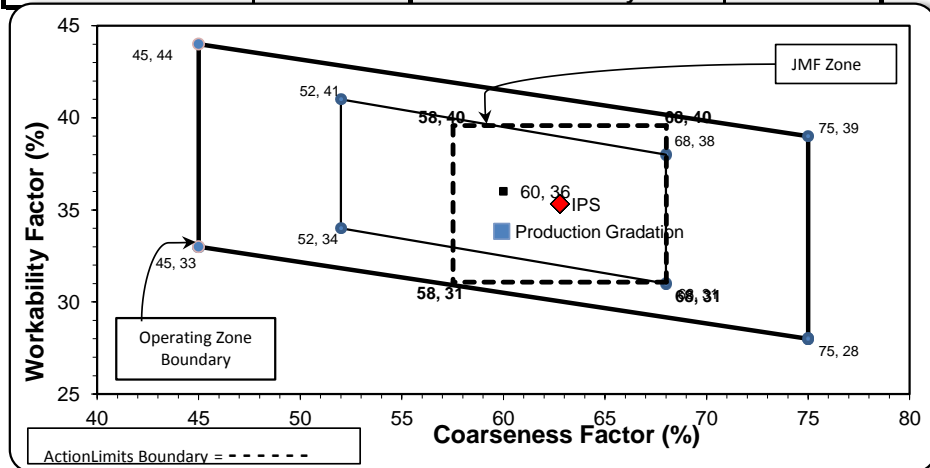


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained 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: **60**      Workability Factor: **34**



Initial Production Sample (IPS)

Coarseness Factor: <b>63</b>		Workability Factor: <b>35</b>	
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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 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

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

Sample Date: 4/3/17

Concrete Grade: **DM**

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

Dates Test Represents: 4/3/2017 to 4/9/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1520	9.06	2.69	50.8
26A	58-003	Stoneco	250	1.49	2.69	8.4
2NS	81-93	Burmeister	1220	7.41	2.64	40.8
<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"	99.7	100.0	100.0	99.8	0.2	0.2
3/4"	80.2	100.0	100.0	89.9	9.9	10.1
1/2"	44.8	99.8	100.0	71.9	18.0	28.1
3/8"	25.5	89.3	100.0	61.2	10.7	38.8
#4	2.2	27.3	99.1	43.8	17.4	56.2
#8	1.0	5.1	84.7	35.5	8.3	64.5
#16	0.8	1.8	67.9	28.3	7.2	71.7
#30	0.8	1.3	46.9	19.7	8.6	80.3
#50	0.6	1.1	16.2	7.0	12.6	93.0
#100	0.6	1.0	2.3	1.3	5.7	98.7
LBW	0.6	0.8	0.9	0.7	0.6	99.3

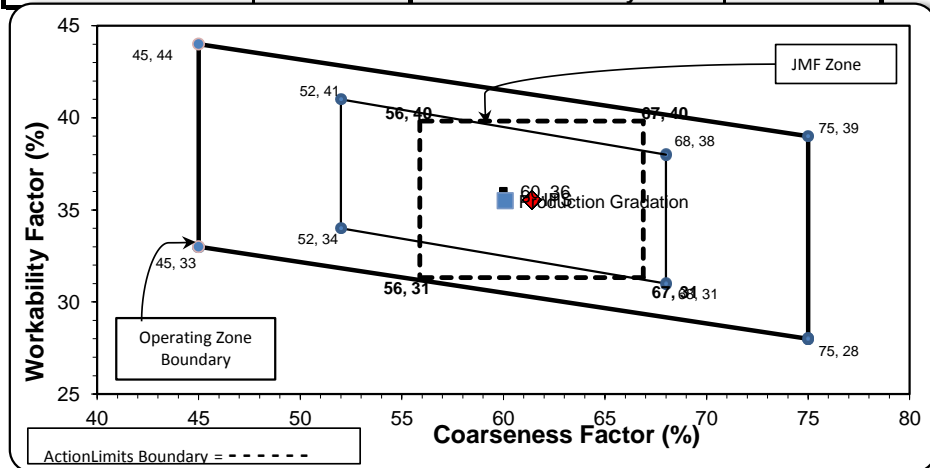
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.



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Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor: 60**      **Workability Factor: 35**



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"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#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

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-39**

Sample Date: 4/3/17

Concrete Grade: **DM**

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

Dates Test Represents: 4/3/2017 to 4/9/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1600	9.79	2.62	54.2
26A	71-47	Presque Isle	100	0.61	2.62	3.4
2NS	63-115	Ray Road	1250	7.56	2.65	42.4
<b>Total Wt</b>			<b>2950</b>	<b>17.96</b>		<b>100.0</b>

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



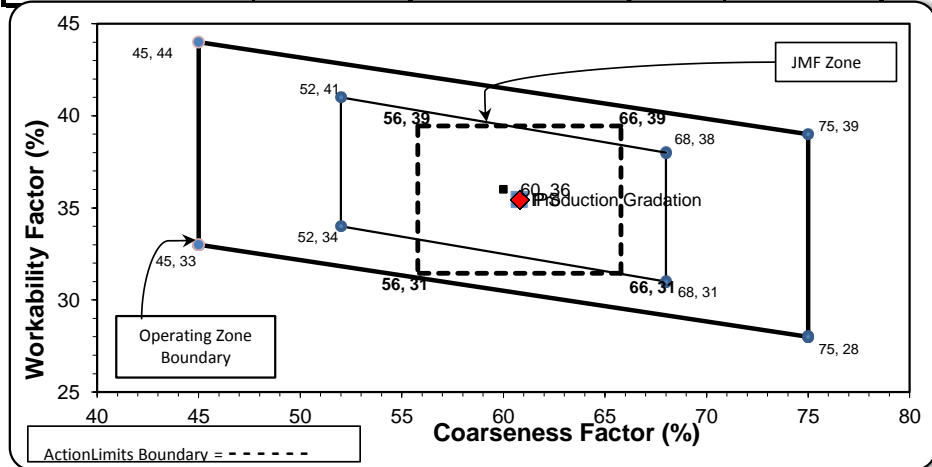
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	88.5	100.0	100.0	93.8	6.2	6.2
1/2"	49.9	95.3	100.0	72.7	21.1	27.3
3/8"	28.9	80.1	100.0	60.8	11.9	39.2
#4	5.7	14.2	96.7	44.5	16.2	55.5
#8	2.4	3.6	80.3	35.4	9.1	64.6
#16	2.0	1.8	62.0	27.4	8.0	72.6
#30	1.9	1.4	45.2	20.2	7.2	79.8
#50	1.9	1.3	21.6	10.2	10.0	89.8
#100	1.9	1.2	3.9	2.7	7.5	97.3
LBW	1.7	1.0	1.3	1.5	1.2	98.5

\*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

<b>Coarseness Factor:</b>	<b>61</b>	<b>Workability Factor:</b>	<b>35</b>
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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"	100.0	0.0	0.0
3/4"	93.8	6.2	6.2
1/2"	72.7	21.1	27.3
3/8"	60.8	11.9	39.2
#4	44.5	16.2	55.5
#8	35.4	9.1	64.6
#16	27.4	8.0	72.6
#30	20.2	7.2	79.8
#50	10.2	10.0	89.8
#100	2.7	7.5	97.3
LBW	1.5	1.2	98.5

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