

# Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

**PLANT #:** **P-101**

Sample Date: 5/15/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/15/2017 to 5/21/2017

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	51.4
26A	71-47	Presque Isle	150	0.92	2.62	4.8
2NS	63-115	Ray Road	1360	8.22	2.65	43.7
<b>Total Wt</b>			<b>3110</b>	<b>18.93</b>		<b>100.0</b>

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



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

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"	90.4	100.0	100.0	95.1	4.9	4.9
1/2"	48.6	97.3	100.0	73.4	21.6	26.6
3/8"	26.6	82.6	100.0	61.4	12.0	38.6
#4	3.8	10.4	97.7	45.2	16.2	54.8
#8	2.0	2.1	79.2	35.8	9.4	64.2
#16	1.6	1.4	59.4	26.9	8.9	73.1
#30	1.6	1.3	42.9	19.6	7.2	80.4
#50	1.5	1.3	21.4	10.2	9.5	89.8
#100	1.5	1.2	4.3	2.7	7.5	97.3
LBW	1.3	1.1	0.5	0.9	1.8	99.1

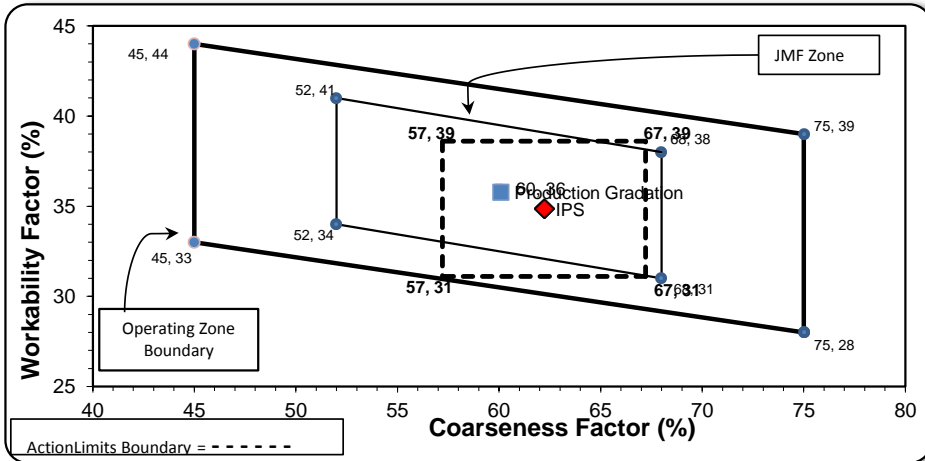
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **60**      **Workability Factor:** **36**

Initial Production Sample (IPS)

<b>Coarseness Factor:</b> <b>62</b>		<b>Workability Factor:</b> <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"	100.0	0.0	0.0
3/4"	95.0	5.0	5.0
1/2"	71.1	23.9	28.9
3/8"	59.5	11.7	40.5
#4	44.0	15.5	56.0
#8	34.9	9.1	65.1
#16	27.6	7.2	72.4
#30	20.2	7.4	79.8
#50	8.9	11.3	91.1
#100	2.7	6.2	97.3
LBW	1.4	1.2	98.6



PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

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

Sample Date: 5/15/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/15/2017 to 5/21/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1650	9.83	2.69	52.3
26A	58-003	Stoneco	215	1.28	2.69	6.8
2NS	81-93	Burmeister	1290	7.83	2.64	40.9
<b>Total Wt</b>			<b>3155</b>	<b>18.94</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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	80.0	100.0	100.0	89.5	10.4	10.5
1/2"	44.5	100.0	100.0	71.0	18.6	29.0
3/8"	23.8	85.3	100.0	59.1	11.8	40.9
#4	2.6	24.0	99.0	43.5	15.7	56.5
#8	0.9	5.8	84.9	35.6	7.9	64.4
#16	0.7	2.8	68.2	28.4	7.1	71.6
#30	0.6	2.2	47.4	19.8	8.6	80.2
#50	0.6	2.0	17.4	7.6	12.3	92.4
#100	0.5	1.9	3.1	1.7	5.9	98.3
LBW	0.4	1.7	1.1	0.8	0.9	99.2

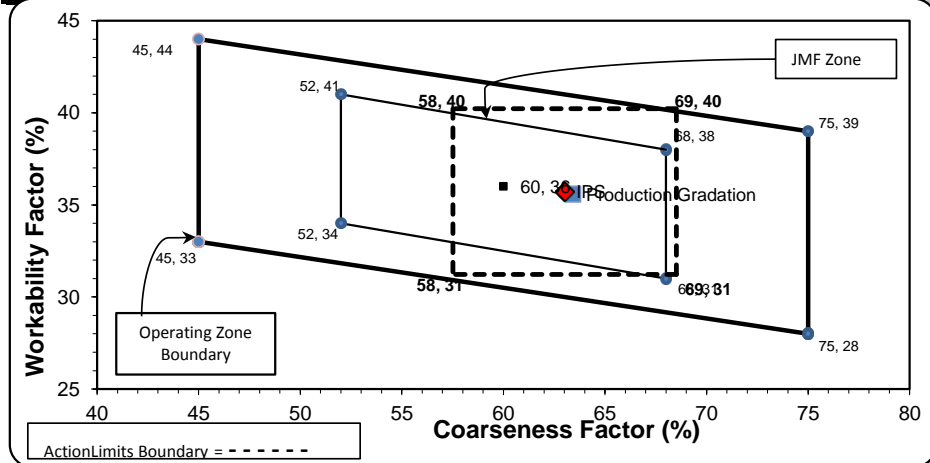


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained 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: 63**      **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	0.8	0.8
3/4"	90.9	8.3	9.1
1/2"	71.3	19.6	28.7
3/8"	59.5	11.8	40.5
#4	43.8	15.7	56.2
#8	35.7	8.1	64.3
#16	27.0	8.7	73.0
#30	18.6	8.4	81.4
#50	6.8	11.8	93.2
#100	1.4	5.4	98.6
LBW	0.6	0.8	99.4

PREPARED BY:  
 SM, LLC Technical Service

Approved BY:

# Aggregate Optimization Chart

MIX ID'S: WSN175E9

Production Gradation Report

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

Sample Date: 5/15/17

Dates Test Represents: 5/15/2017 to 5/21/2017

Concrete Grade: **S2M (SPECIAL, 5000 PSI)**

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

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1580	9.41	2.69	52.8
26A	71-47	Presque Isle	150	0.92	2.62	5.0
2NS	63-92	AA Grange Hall	1260	7.62	2.65	42.1
<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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	80.0	100.0	100.0	89.4	10.5	10.6
1/2"	44.5	97.3	100.0	70.5	18.9	29.5
3/8"	23.8	82.6	100.0	58.9	11.7	41.1
#4	2.6	10.4	97.8	43.1	15.8	56.9
#8	0.9	2.1	85.0	36.4	6.7	63.6
#16	0.7	1.4	68.6	29.3	7.1	70.7
#30	0.6	1.3	47.2	20.3	9.1	79.7
#50	0.6	1.3	18.9	8.3	11.9	91.7
#100	0.5	1.2	2.6	1.4	6.9	98.6
LBW	0.4	1.1	0.3	0.4	1.0	99.6

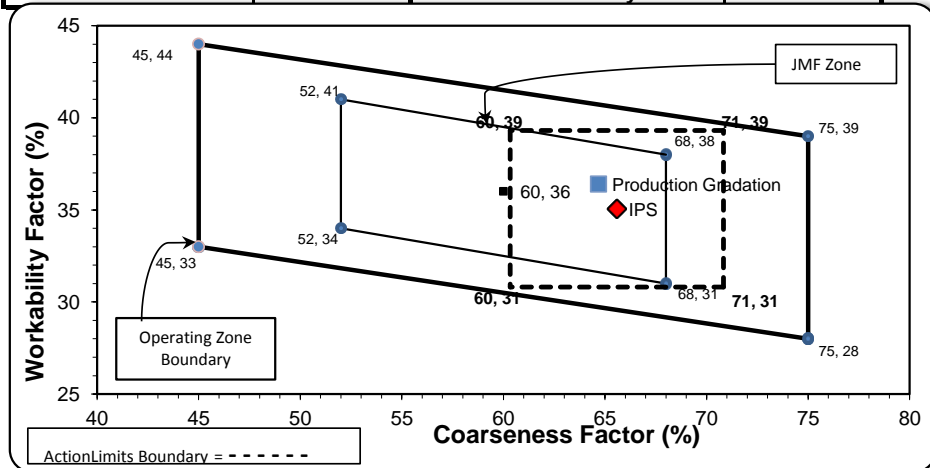
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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



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Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor: 65**      **Workability Factor: 36**



Initial Production Sample (IPS)

Coarseness Factor: 66		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"	100.0	0.0	0.0
3/4"	91.7	8.3	8.3
1/2"	66.8	24.8	33.2
3/8"	57.4	9.4	42.6
#4	43.0	14.4	57.0
#8	35.1	7.9	64.9
#16	28.0	7.1	72.0
#30	19.5	8.5	80.5
#50	8.1	11.4	91.9
#100	2.0	6.1	98.0
LBW	0.7	1.3	99.3

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

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

Sample Date: 5/15/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/15/2017 to 5/21/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1650	9.83	2.69	52.3
26A	58-003	Stoneco	215	1.28	2.69	6.8
2NS	81-93	Burmeister	1290	7.83	2.64	40.9
<b>Total Wt</b>			<b>3155</b>	<b>18.94</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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	80.0	100.0	100.0	89.5	10.4	10.5
1/2"	44.5	100.0	100.0	71.0	18.6	29.0
3/8"	23.8	85.3	100.0	59.1	11.8	40.9
#4	2.6	24.0	99.0	43.5	15.7	56.5
#8	0.9	5.8	84.9	35.6	7.9	64.4
#16	0.7	2.8	68.2	28.4	7.1	71.6
#30	0.6	2.2	47.4	19.8	8.6	80.2
#50	0.6	2.0	17.4	7.6	12.3	92.4
#100	0.5	1.9	3.1	1.7	5.9	98.3
LBW	0.4	1.7	1.1	0.8	0.9	99.2

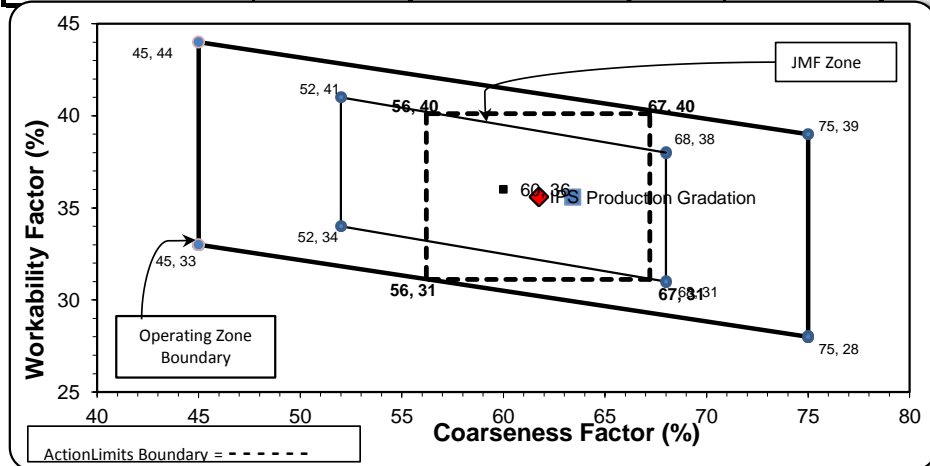


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained 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:** **63**      **Workability Factor:** **36**



Initial Production Sample (IPS)

Coarseness Factor:		62	
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"	99.2	0.8	0.8
3/4"	91.1	8.1	8.9
1/2"	72.0	19.1	28.0
3/8"	60.3	11.7	39.7
#4	43.4	16.9	56.6
#8	35.6	7.8	64.4
#16	28.4	7.2	71.6
#30	21.8	6.7	78.2
#50	9.1	12.6	90.9
#100	1.7	7.4	98.3
LBW	1.1	0.6	98.9

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

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

Sample Date: 5/15/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/15/2017 to 5/21/2017

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	51.4
26A	71-47	Presque Isle	150	0.92	2.62	4.8
2NS	63-115	Ray Road	1360	8.22	2.65	43.7
<b>Total Wt</b>			<b>3110</b>	<b>18.93</b>		<b>100.0</b>

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



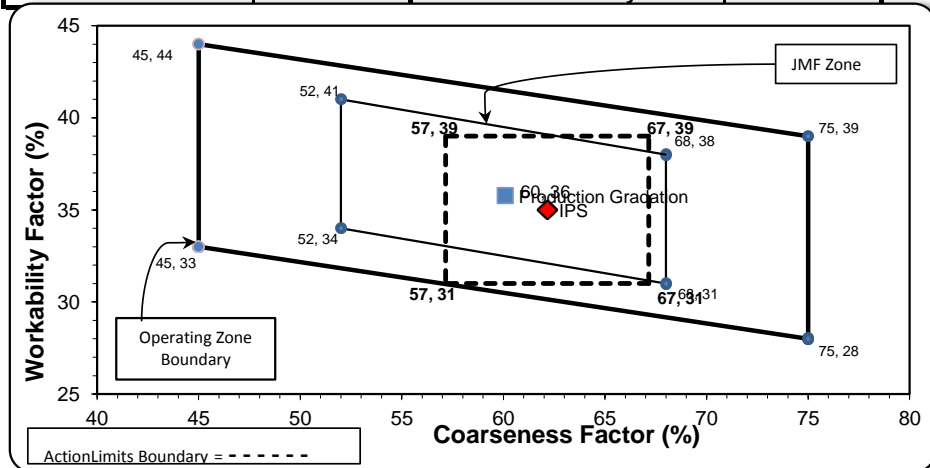
**Superior Materials, LLC**  
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 Suite 500  
 Farmington Hills, MI 48336

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"	90.4	100.0	100.0	95.1	4.9	4.9
1/2"	48.6	97.3	100.0	73.4	21.6	26.6
3/8"	26.6	82.6	100.0	61.4	12.0	38.6
#4	3.8	10.4	97.7	45.2	16.2	54.8
#8	2.0	2.1	79.2	35.8	9.4	64.2
#16	1.6	1.4	59.4	26.9	8.9	73.1
#30	1.6	1.3	42.9	19.6	7.2	80.4
#50	1.5	1.3	21.4	10.2	9.5	89.8
#100	1.5	1.2	4.3	2.7	7.5	97.3
LBW	1.3	1.1	0.5	0.9	1.8	99.1

\*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>60</b>	<b>Workability Factor:</b>	<b>36</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"	95.0	5.0	5.0
1/2"	71.2	23.8	28.8
3/8"	59.6	11.6	40.4
#4	44.1	15.5	55.9
#8	35.0	9.1	65.0
#16	27.7	7.3	72.3
#30	20.3	7.4	79.7
#50	8.9	11.4	91.1
#100	2.7	6.3	97.3
LBW	1.4	1.2	98.6

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