

# Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

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

Sample Date: 5/1/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/1/2017 to 5/7/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	48.2
26A	71-47	Presque Isle	250	1.53	2.62	8.0
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%

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"	86.1	100.0	100.0	93.3	6.7	6.7
1/2"	37.8	97.6	100.0	69.8	23.5	30.2
3/8"	18.1	84.1	100.0	59.2	10.6	40.8
#4	2.7	11.4	97.3	44.8	14.5	55.2
#8	1.7	2.8	78.7	35.5	9.3	64.5
#16	1.5	1.7	60.8	27.4	8.0	72.6
#30	1.4	1.5	43.9	20.0	7.5	80.0
#50	1.3	1.4	20.7	9.8	10.2	90.2
#100	1.3	1.4	3.8	2.4	7.4	97.6
LBW	1.1	1.3	0.5	0.9	1.5	99.1



**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

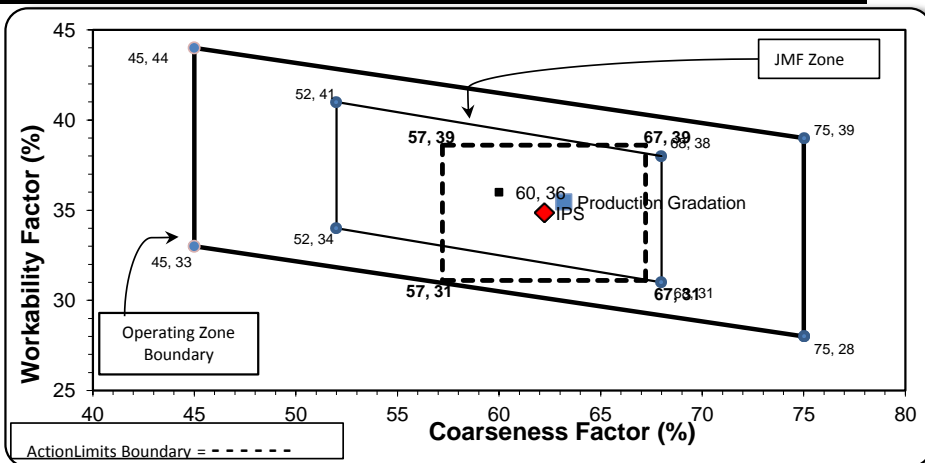
**Coarseness Factor:** **63**      **Workability Factor:** **35**

Initial Production Sample (IPS)

**Coarseness Factor:** **62**

**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"	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: 5/1/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/1/2017 to 5/7/2017

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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	80.6	100.0	100.0	89.9	9.9	10.1
1/2"	44.6	99.9	100.0	71.0	18.8	29.0
3/8"	27.1	86.8	100.0	61.0	10.0	39.0
#4	3.7	20.6	99.0	43.8	17.2	56.2
#8	1.0	5.2	85.0	35.6	8.2	64.4
#16	0.7	2.3	68.3	28.4	7.2	71.6
#30	0.6	1.7	46.9	19.6	8.8	80.4
#50	0.6	1.4	16.7	7.2	12.4	92.8
#100	0.5	1.3	2.9	1.5	5.7	98.5
LBW	0.4	1.0	1.1	0.7	0.8	99.3

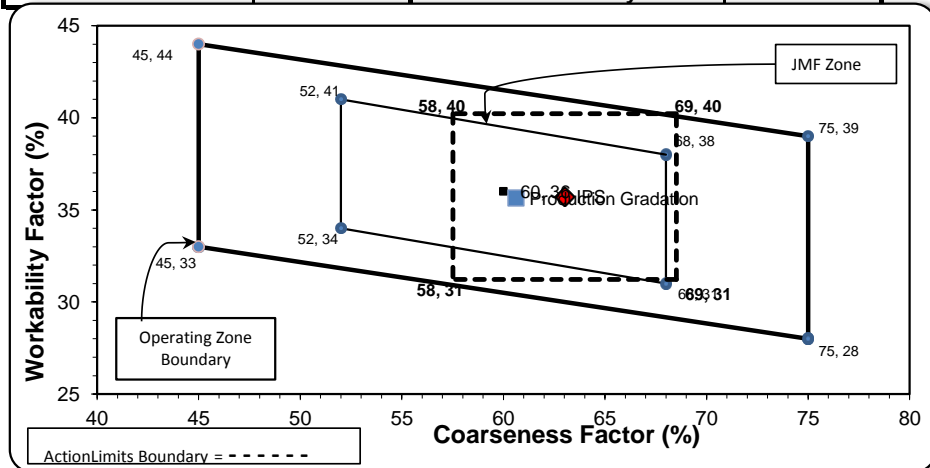


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained 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: 61**      **Workability Factor: 36**



Initial Production Sample (IPS)

Coarseness Factor: 63		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"	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: 5/1/17

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

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

Dates Test Represents: 5/1/2017 to 5/7/2017

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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	80.6	100.0	100.0	89.7	10.0	10.3
1/2"	44.6	97.6	100.0	70.6	19.1	29.4
3/8"	27.1	84.1	100.0	60.7	9.9	39.3
#4	3.7	11.4	97.5	43.6	17.1	56.4
#8	1.0	2.8	84.1	36.1	7.5	63.9
#16	0.7	1.7	67.4	28.9	7.3	71.1
#30	0.6	1.5	47.6	20.5	8.4	79.5
#50	0.6	1.4	19.6	8.6	11.8	91.4
#100	0.5	1.4	2.5	1.4	7.3	98.6
LBW	0.4	1.3	0.2	0.4	1.0	99.6

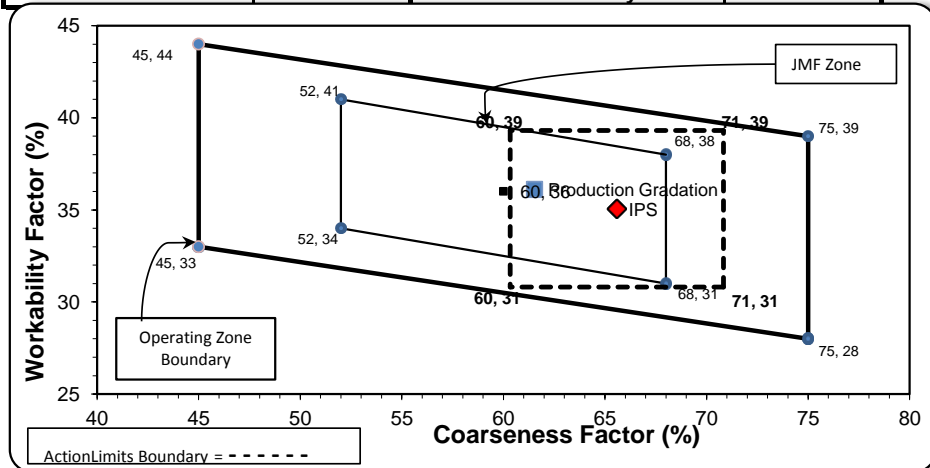


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 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

<b>Coarseness Factor:</b>	<b>62</b>	<b>Workability Factor:</b>	<b>36</b>
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Initial Production Sample (IPS)

<b>Coarseness Factor:</b>		<b>66</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"	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: 5/1/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/1/2017 to 5/7/2017

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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	80.6	100.0	100.0	89.9	9.9	10.1
1/2"	44.6	99.9	100.0	71.0	18.8	29.0
3/8"	27.1	86.8	100.0	61.0	10.0	39.0
#4	3.7	20.6	99.0	43.8	17.2	56.2
#8	1.0	5.2	85.0	35.6	8.2	64.4
#16	0.7	2.3	68.3	28.4	7.2	71.6
#30	0.6	1.7	46.9	19.6	8.8	80.4
#50	0.6	1.4	16.7	7.2	12.4	92.8
#100	0.5	1.3	2.9	1.5	5.7	98.5
LBW	0.4	1.0	1.1	0.7	0.8	99.3

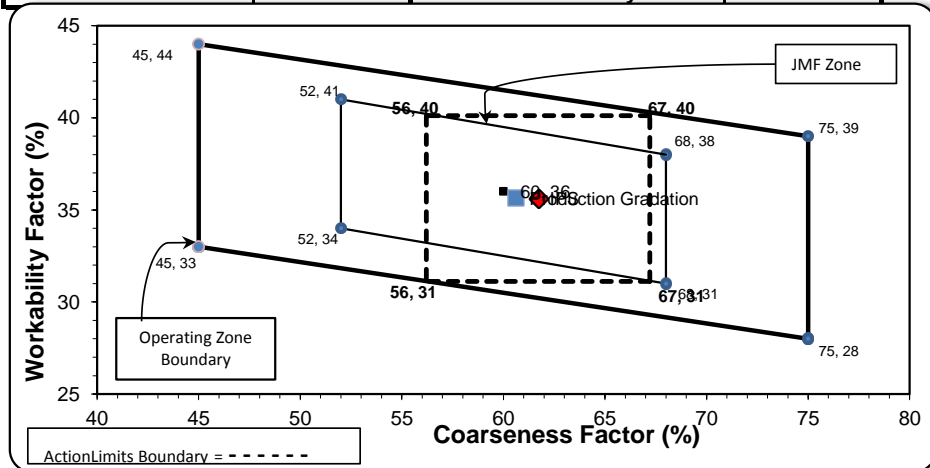


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 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **61**      **Workability Factor:** **36**



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"	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: 5/1/17

Concrete Grade: **S2M**

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

Dates Test Represents: 5/1/2017 to 5/7/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	48.2
26A	71-47	Presque Isle	250	1.53	2.62	8.0
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%

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"	86.1	100.0	100.0	93.3	6.7	6.7
1/2"	37.8	97.6	100.0	69.8	23.5	30.2
3/8"	18.1	84.1	100.0	59.2	10.6	40.8
#4	2.7	11.4	97.3	44.8	14.5	55.2
#8	1.7	2.8	78.7	35.5	9.3	64.5
#16	1.5	1.7	60.8	27.4	8.0	72.6
#30	1.4	1.5	43.9	20.0	7.5	80.0
#50	1.3	1.4	20.7	9.8	10.2	90.2
#100	1.3	1.4	3.8	2.4	7.4	97.6
LBW	1.1	1.3	0.5	0.9	1.5	99.1

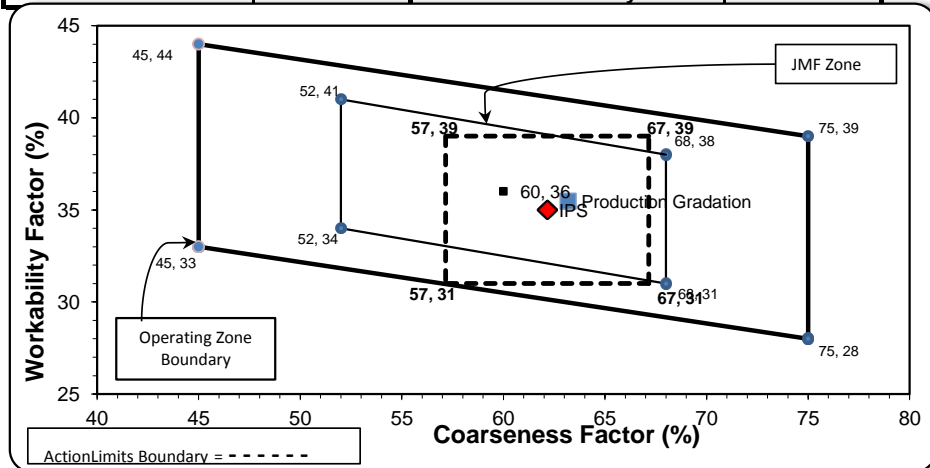


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained 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: 63**      **Workability Factor: 35**



Initial Production Sample (IPS)

Coarseness Factor: 62		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"	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

PREPARED BY:  
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Approved By: