

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-102**

Sample Date: 11/26/18

Concrete Grade: **DM**

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

Dates Test Represents: 11/27/2018 through 12/3/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	45.9
26A	58-003	Stoneco	500	2.98	2.69	16.7
2NS	38-046	Chelsea	1120	6.77	2.65	37.4
<b>Total Wt</b>			<b>2995</b>	<b>17.94</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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	81.3	100.0	100.0	91.4	8.3	8.6
1/2"	39.0	99.8	100.0	72.0	19.5	28.0
3/8"	17.2	89.7	100.0	60.3	11.7	39.7
#4	3.2	23.8	100.0	42.8	17.4	57.2
#8	2.1	5.9	86.0	34.1	8.7	65.9
#16	2.0	2.5	64.0	25.3	8.8	74.7
#30	1.9	1.9	43.0	17.3	8.0	82.7
#50	1.8	1.7	23.0	9.7	7.6	90.3
#100	1.8	1.6	4.0	2.6	7.1	97.4
LBW	1.4	1.5	0.9	1.2	1.4	98.8

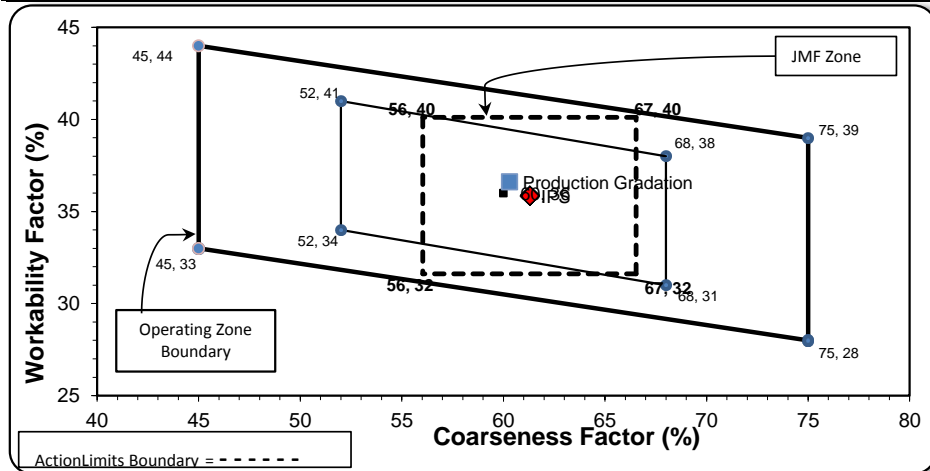
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>60</b>	<b>Workability Factor:</b>	<b>34</b>	<b>Adjusted WF</b>	<b>36.6</b>
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

<b>Coarseness Factor:</b>	<b>61</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"	99.3	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, DDD0K7E8 and DDD0K7E9

Production Gradation Report

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

Sample Date: 11/26/18

Concrete Grade: **DM**

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

Dates Test Represents: 11/27/2018 through 12/3/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1300	7.95	2.62	44.1
26A	71-47	Presque Isle	500	3.06	2.62	16.9
2NS	95-13	Smelter Bay	1150	6.95	2.65	39.0
<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"	83.1	100.0	100.0	92.6	7.4	7.4
1/2"	31.0	97.0	100.0	69.1	23.5	30.9
3/8"	12.4	84.0	100.0	58.7	10.4	41.3
#4	2.4	10.7	97.7	41.0	17.7	59.0
#8	2.1	1.6	85.1	34.4	6.6	65.6
#16	1.9	0.8	68.6	27.7	6.7	72.3
#30	1.8	0.6	48.4	19.8	8.0	80.2
#50	1.7	0.6	20.5	8.8	10.9	91.2
#100	1.6	0.5	4.3	2.5	6.4	97.5
LBW	1.1	0.3	0.9	0.9	1.6	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.



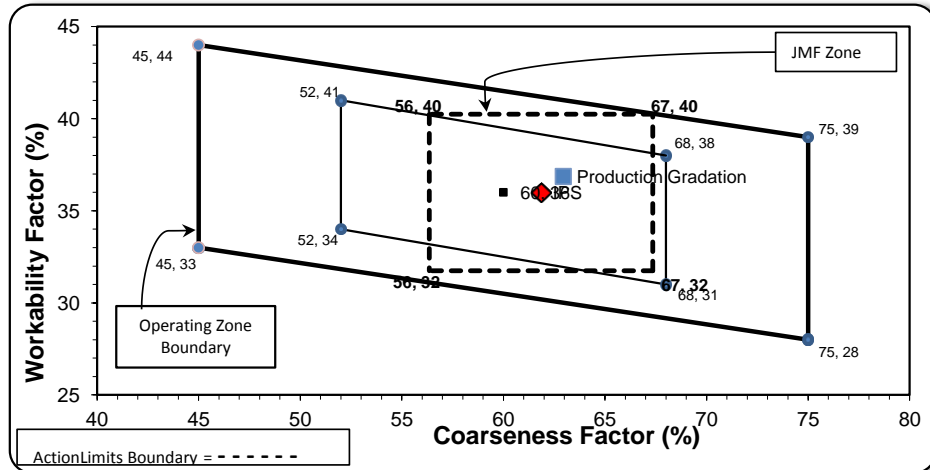
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>63</b>	<b>Workability Factor:</b>	<b>34</b>	<b>Adjusted WF</b>	<b>36.9</b>
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

<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, DDD0K7E8 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-35**

Sample Date: 11/26/18

Concrete Grade: **DM**

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

Dates Test Represents: 11/27/2018 through 12/3/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1440	8.58	2.69	48.2
26A	58-003	Stoneco	350	2.09	2.69	11.7
2NS	81-93	Burmeister	1200	7.28	2.64	40.1
<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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	81.3	100.0	100.0	91.0	8.7	9.0
1/2"	39.0	99.8	100.0	70.6	20.4	29.4
3/8"	17.2	89.7	100.0	58.9	11.7	41.1
#4	3.2	23.8	98.3	43.8	15.1	56.2
#8	2.1	5.9	81.8	34.5	9.2	65.5
#16	2.0	2.5	61.8	26.1	8.5	73.9
#30	1.9	1.9	41.7	17.9	8.2	82.1
#50	1.8	1.7	14.9	7.0	10.8	93.0
#100	1.8	1.6	2.5	2.1	5.0	97.9
LBW	1.4	1.5	0.7	1.1	0.9	98.9



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

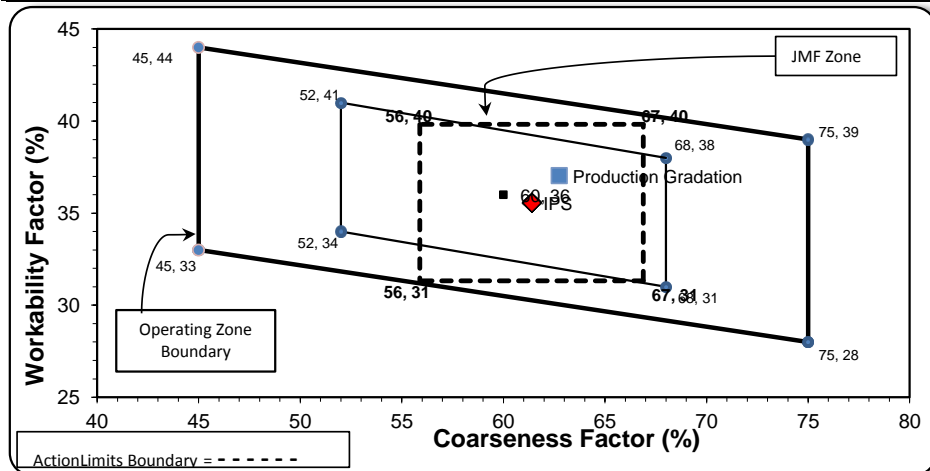
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>63</b>	<b>Workability Factor:</b>	<b>35</b>	<b>Adjusted WF</b>	<b>37.0</b>
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

<b>Coarseness Factor:</b>	<b>61</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"	99.3	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, DDD0K7E8 and DDD0K7E9

Production Gradation Report

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

Sample Date: 11/26/18

Concrete Grade: **DM**

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

Dates Test Represents: 11/27/2018 through 12/3/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	47.5
26A	71-47	Presque Isle	400	2.45	2.62	13.6
2NS	63-92	AA Grange Hall	1150	6.95	2.65	39.0
<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"	81.6	100.0	100.0	91.3	8.7	8.7
1/2"	39.3	97.0	100.0	70.8	20.5	29.2
3/8"	16.0	84.0	100.0	58.0	12.8	42.0
#4	2.2	10.7	97.4	40.5	17.5	59.5
#8	1.4	1.6	84.0	33.6	6.8	66.4
#16	1.3	0.8	68.0	27.2	6.4	72.8
#30	1.2	0.6	47.5	19.2	8.1	80.8
#50	1.2	0.6	18.3	7.8	11.4	92.2
#100	1.1	0.5	2.4	1.5	6.3	98.5
LBW	0.8	0.3	0.3	0.5	1.0	99.5



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

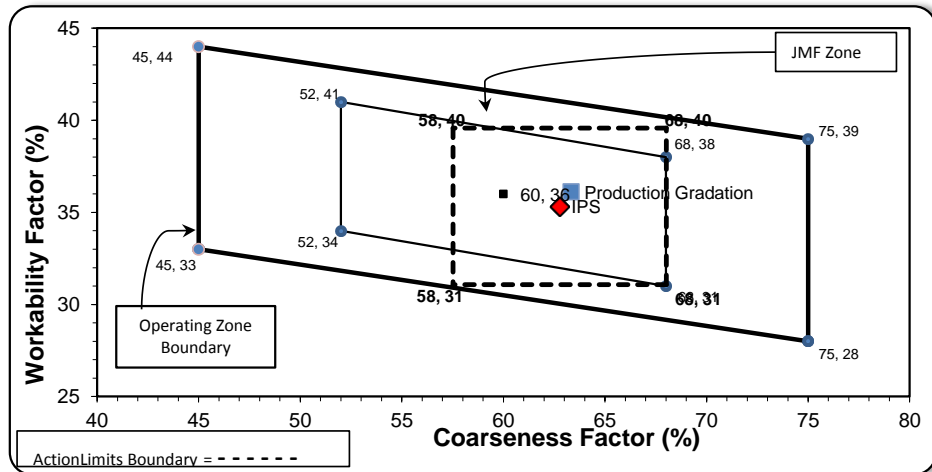
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>63</b>	<b>Workability Factor:</b>	<b>34</b>	<b>Adjusted WF</b>	<b>36.1</b>
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

<b>Coarseness Factor:</b>	<b>63</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"	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

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

**PLANT #:** **P-02**

Sample Date: 11/26/18

Concrete Grade: **DM**

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

Dates Test Represents: 11/27/2018 through 12/3/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	47.5
26A	71-47	Presque Isle	400	2.45	2.62	13.6
2NS	63-92	AA Grange Hall	1150	6.95	2.65	39.0
<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"	81.6	100.0	100.0	91.3	8.7	8.7
1/2"	39.3	97.0	100.0	70.8	20.5	29.2
3/8"	16.0	84.0	100.0	58.0	12.8	42.0
#4	2.2	10.7	97.4	40.5	17.5	59.5
#8	1.4	1.6	84.0	33.6	6.8	66.4
#16	1.3	0.8	68.0	27.2	6.4	72.8
#30	1.2	0.6	47.5	19.2	8.1	80.8
#50	1.2	0.6	18.3	7.8	11.4	92.2
#100	1.1	0.5	2.4	1.5	6.3	98.5
LBW	0.8	0.3	0.3	0.5	1.0	99.5



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

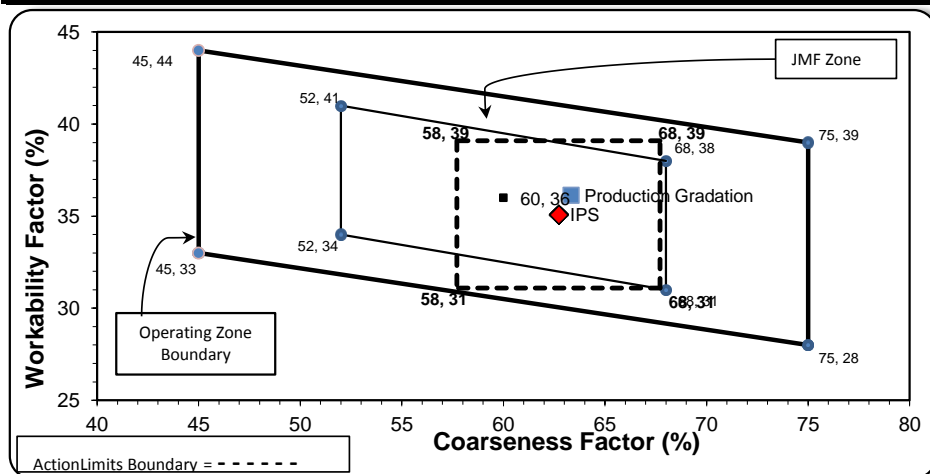
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>63</b>	<b>Workability Factor:</b>	<b>34</b>
---------------------------	-----------	----------------------------	-----------

<b>Coarseness Factor:</b>	<b>63</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"	95.1	4.9	4.9
1/2"	74.6	20.5	25.4
3/8"	59.3	15.3	40.7
#4	42.1	17.2	57.9
#8	35.1	7.1	64.9
#16	29.2	5.9	70.8
#30	21.9	7.3	78.1
#50	9.6	12.4	90.4
#100	2.4	7.2	97.6
LBW	0.9	1.5	99.1

PREPARED BY:  
 SM, LLC Technical Service

Approved By: