

# Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

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

Sample Date: 6/18/18

Concrete Grade: **P1M**

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

Dates Test Represents: 6/19/2018 through 6/25/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1000	6.12	2.62	32.6
IA	71-47	Presque Isle	750	4.59	2.62	24.4
2NS	75-051	Mid-Michigan	1320	7.95	2.66	43.0
<b>Total Wt</b>			<b>3070</b>	<b>18.66</b>		<b>100.0</b>

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

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.4	0.6	0.6
1"	50.0	100.0	100.0	83.7	15.7	16.3
3/4"	12.9	100.0	100.0	71.6	12.1	28.4
1/2"	3.4	91.1	100.0	66.4	5.3	33.6
3/8"	2.2	66.0	100.0	59.8	6.5	40.2
#4	1.7	16.2	98.8	47.0	12.8	53.0
#8	1.6	4.0	79.4	35.6	11.4	64.4
#16	1.6	2.5	63.2	28.3	7.3	71.7
#30	1.5	2.2	48.2	21.8	6.6	78.2
#50	1.5	2.1	24.4	11.5	10.3	88.5
#100	1.4	1.9	6.0	3.5	8.0	96.5
LBW	1.0	1.7	0.9	1.1	2.4	98.9

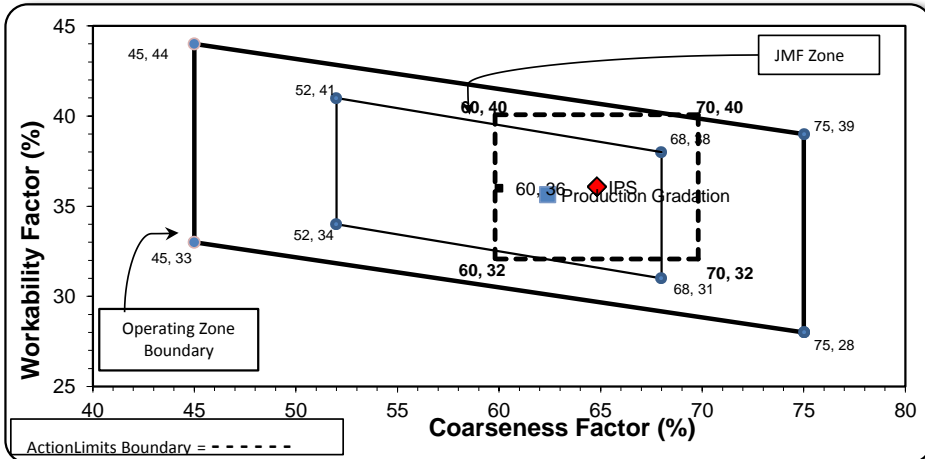


**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
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 Farmington Hills, MI 48336

\*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

<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>65</b>		
<b>Workability Factor:</b>	<b>36</b>		
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.3	0.7	0.7
1"	83.6	15.7	16.4
3/4"	73.0	10.6	27.0
1/2"	65.1	7.9	34.9
3/8"	58.6	6.5	41.4
#4	45.8	12.8	54.2
#8	36.1	9.7	63.9
#16	28.8	7.3	71.2
#30	21.7	7.1	78.3
#50	10.3	11.4	89.7
#100	3.1	7.2	96.9
LBW	1.3	1.8	98.7

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

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

Sample Date: 6/18/18

Concrete Grade: **P1M**

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

Dates Test Represents: 6/19/2018 through 6/25/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1280	7.63	2.69	41.0
IA	58-003	Stoneco	640	3.81	2.69	20.5
2NS	38-046	Chelsea	1200	7.26	2.65	38.5
<b>Total Wt</b>			<b>3120</b>	<b>18.70</b>		<b>100.0</b>

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

Sieve	CA	IA	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"	69.3	100.0	100.0	87.4	12.6	12.6
3/4"	36.8	100.0	100.0	74.1	13.3	25.9
1/2"	8.1	94.3	100.0	61.1	12.9	38.9
3/8"	3.1	84.3	100.0	57.0	4.1	43.0
#4	1.6	25.7	100.0	44.4	12.6	55.6
#8	1.3	5.5	88.0	35.5	8.9	64.5
#16	1.1	2.0	63.0	25.1	10.4	74.9
#30	1.0	1.5	39.0	15.7	9.4	84.3
#50	0.9	1.4	17.0	7.2	8.5	92.8
#100	0.9	1.3	3.0	1.8	5.4	98.2
LBW	0.8	1.1	0.9	0.9	0.9	99.1

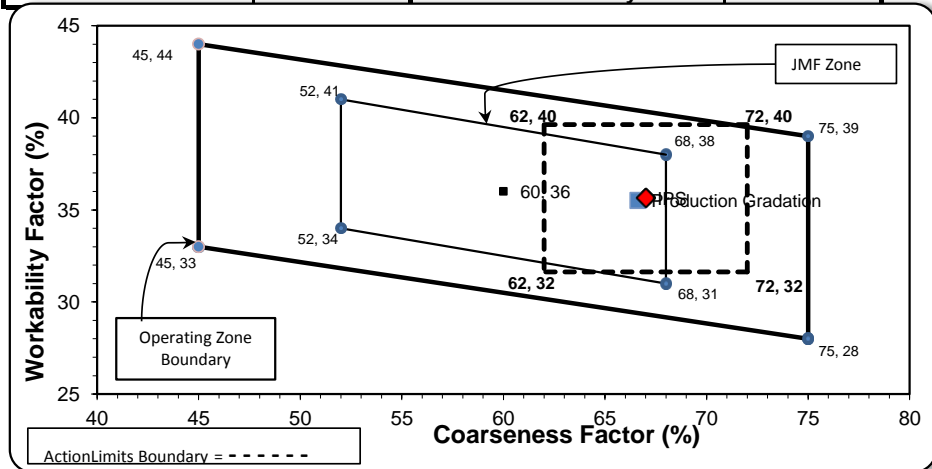


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained 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: 67**      **Workability Factor: 36**



Initial Production Sample (IPS)

Coarseness Factor: 67		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"	87.2	12.8	12.8
3/4"	76.6	10.6	23.4
1/2"	64.4	12.2	35.6
3/8"	56.9	7.6	43.1
#4	44.1	12.7	55.9
#8	35.6	8.5	64.4
#16	27.7	8.0	72.3
#30	19.5	8.2	80.5
#50	7.8	11.6	92.2
#100	2.3	5.6	97.7
LBW	0.6	1.6	99.4

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Approved By:

# Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

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

Sample Date: 6/18/18

Concrete Grade: **P1M**

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

Dates Test Represents: 6/19/2018 through 6/25/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	925	5.66	2.62	30.1
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	63-92	AA Grange Hall	1275	7.71	2.65	41.5
<b>Total Wt</b>			<b>3070</b>	<b>18.69</b>		<b>100.0</b>

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



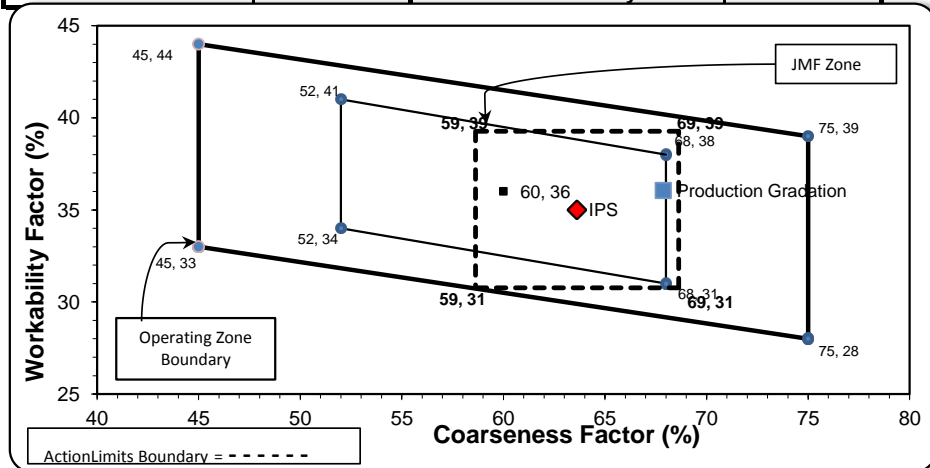
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	43.8	100.0	100.0	83.1	15.8	16.9
3/4"	12.1	97.3	100.0	72.8	10.3	27.2
1/2"	2.8	79.0	100.0	64.8	8.0	35.2
3/8"	2.3	50.7	100.0	56.6	8.2	43.4
#4	2.2	7.2	97.1	43.0	13.6	57.0
#8	2.1	2.6	83.5	36.0	7.0	64.0
#16	2.0	2.0	67.9	29.4	6.7	70.6
#30	2.0	1.9	49.8	21.8	7.5	78.2
#50	1.9	1.8	23.4	10.8	11.0	89.2
#100	1.8	1.7	3.7	2.6	8.2	97.4
LBW	1.4	1.5	0.4	1.0	1.5	99.0

\*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>68</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"	99.4	0.6	0.6
1"	84.6	14.7	15.4
3/4"	74.4	10.3	25.6
1/2"	66.0	8.4	34.0
3/8"	58.7	7.4	41.3
#4	44.6	14.0	55.4
#8	35.0	9.6	65.0
#16	27.6	7.4	72.4
#30	19.5	8.1	80.5
#50	8.6	11.0	91.4
#100	2.0	6.6	98.0
LBW	0.9	1.1	99.1

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# Aggregate Optimization Chart

MIX ID'S: DDP154E7, DDP154E8, DDP164E7 and DDP164E8

Production Gradation Report

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

Sample Date: 6/18/18

Concrete Grade: **P1M**

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

Dates Test Represents: 6/19/2018 through 6/25/2018

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	910	5.57	2.62	29.6
IA	71-47	Presque Isle	920	5.63	2.62	30.0
2NS	47-16	Buno Road	1240	7.50	2.65	40.4
<b>Total Wt</b>			<b>3070</b>	<b>18.69</b>		<b>100.0</b>

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



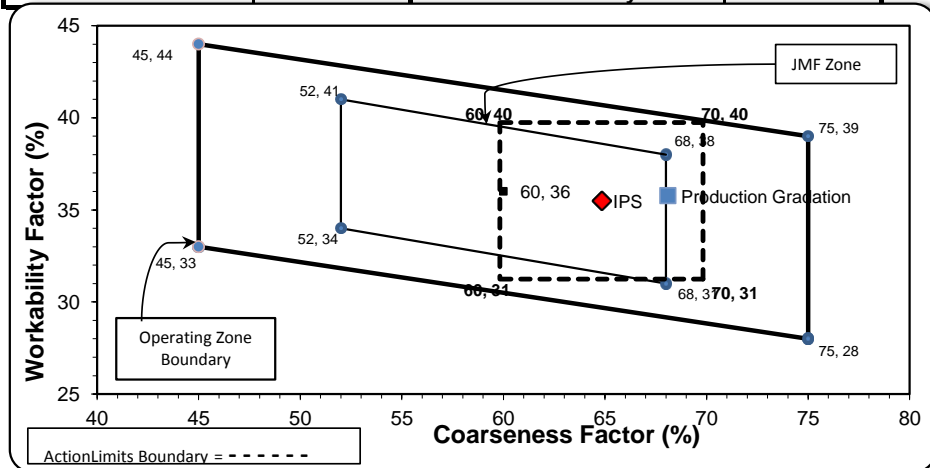
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.9	1.1	1.1
1"	43.8	100.0	100.0	83.3	15.5	16.7
3/4"	12.1	97.3	100.0	73.1	10.2	26.9
1/2"	2.8	79.0	100.0	64.9	8.2	35.1
3/8"	2.3	50.7	100.0	56.3	8.6	43.7
#4	2.2	7.2	95.6	41.4	14.8	58.6
#8	2.1	2.6	85.1	35.8	5.6	64.2
#16	2.0	2.0	72.0	30.3	5.5	69.7
#30	2.0	1.9	53.2	22.7	7.6	77.3
#50	1.9	1.8	19.9	9.1	13.5	90.9
#100	1.8	1.7	2.3	2.0	7.2	98.0
LBW	1.4	1.5	0.4	1.0	0.9	99.0

\*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>68</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"	99.4	0.6	0.6
1"	84.0	15.3	16.0
3/4"	73.5	10.5	26.5
1/2"	65.2	8.2	34.8
3/8"	58.2	7.1	41.8
#4	44.1	14.1	55.9
#8	35.5	8.6	64.5
#16	29.1	6.4	70.9
#30	21.9	7.3	78.1
#50	9.6	12.2	90.4
#100	2.6	7.1	97.4
LBW	1.0	1.6	99.0

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