

# Aggregate Optimization Chart

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

Production Gradation Report

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

Sample Date: 9/25/17

Concrete Grade: **P1M**

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

Dates Test Represents: 9/25/2017 to 10/1/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-115	Ray Road	1320	7.98	2.65	43.0
<b>Total Wt</b>			<b>3070</b>	<b>18.69</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"	91.3	100.0	100.0	97.6	2.4	2.4
1"	35.8	100.0	100.0	82.2	15.4	17.8
3/4"	9.6	97.9	100.0	74.4	7.9	25.6
1/2"	1.9	76.0	100.0	65.8	8.6	34.2
3/8"	1.8	46.7	100.0	57.2	8.6	42.8
#4	1.8	6.6	97.5	44.4	12.8	55.6
#8	1.7	2.2	80.7	35.8	8.5	64.2
#16	1.7	1.8	62.5	27.9	7.9	72.1
#30	1.7	1.6	45.4	20.5	7.4	79.5
#50	1.6	1.6	22.7	10.7	9.8	89.3
#100	1.5	1.5	5.4	3.2	7.5	96.8
LBW	1.2	1.4	0.5	1.0	2.2	99.0



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 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

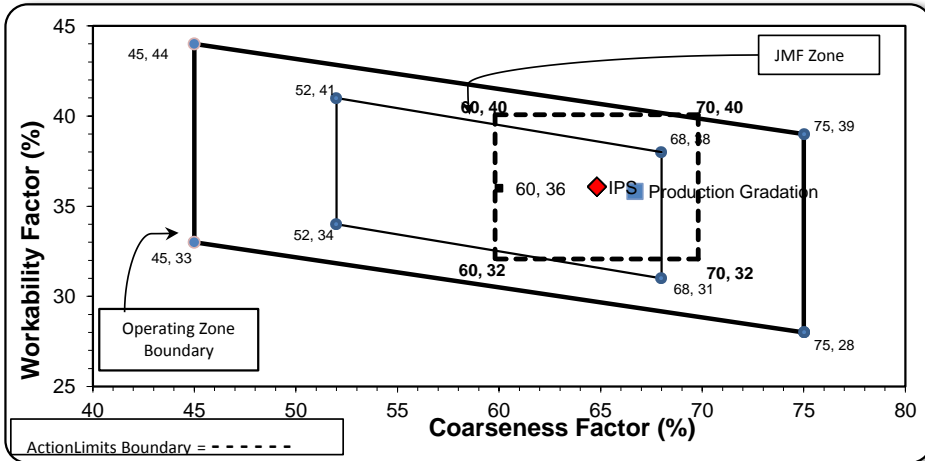
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2"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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

<b>Coarseness Factor:</b>	<b>67</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 and DDP154E8

Production Gradation Report

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

Sample Date: 9/25/17

Concrete Grade: **P1M**

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

Dates Test Represents: 9/25/2017 to 10/1/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.5
IA	58-003	Stoneco	550	3.28	2.69	17.5
2NS	63-114	AA Highland	1230	7.44	2.65	39.0
<b>Total Wt</b>			<b>3150</b>	<b>18.88</b>		<b>100.0</b>

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



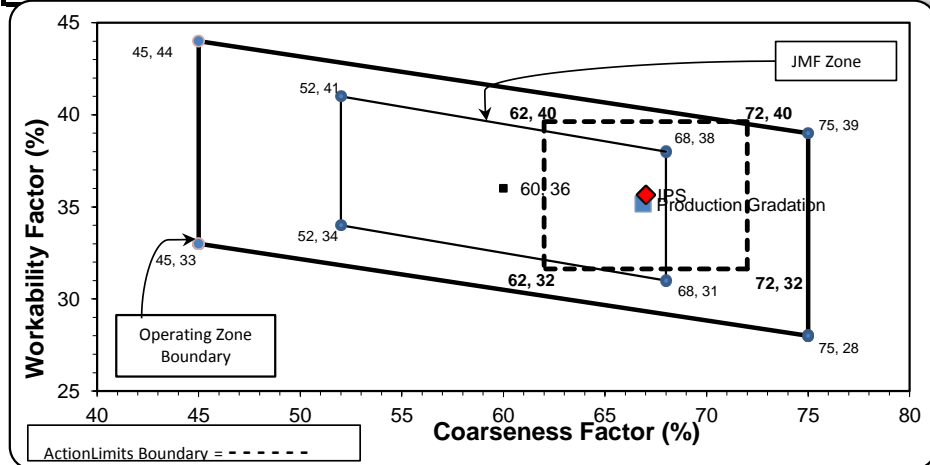
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 Suite 500  
 Farmington Hills, MI 48336

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"	63.2	100.0	100.0	84.0	16.0	16.0
3/4"	33.4	100.0	100.0	71.0	13.0	29.0
1/2"	15.0	94.8	100.0	62.1	8.9	37.9
3/8"	6.4	84.8	100.0	56.6	5.5	43.4
#4	1.8	26.8	99.7	44.4	12.2	55.6
#8	1.4	6.9	85.4	35.2	9.2	64.8
#16	1.2	2.6	64.6	26.2	9.0	73.8
#30	1.1	1.8	42.6	17.4	8.8	82.6
#50	0.9	1.6	13.1	5.8	11.6	94.2
#100	0.8	1.4	1.7	1.3	4.5	98.7
LBW	0.8	1.3	0.3	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.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **67**      Workability Factor: **35**



Initial Production Sample (IPS)

Coarseness Factor: <b>67</b>		Workability Factor: <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"	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

PREPARED BY:

Approved By:

# Aggregate Optimization Chart

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

Production Gradation Report

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

Sample Date: 9/25/17

Concrete Grade: **P1M**

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

Dates Test Represents: 9/25/2017 to 10/1/2017

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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	850	5.20	2.62	27.7
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-115	Ray Road	1320	7.98	2.65	43.0
<b>Total Wt</b>			<b>3070</b>	<b>18.69</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"	91.3	100.0	100.0	97.6	2.4	2.4
1"	35.8	100.0	100.0	82.2	15.4	17.8
3/4"	9.6	97.9	100.0	74.4	7.9	25.6
1/2"	1.9	76.0	100.0	65.8	8.6	34.2
3/8"	1.8	46.7	100.0	57.2	8.6	42.8
#4	1.8	6.6	97.5	44.4	12.8	55.6
#8	1.7	2.2	80.7	35.8	8.5	64.2
#16	1.7	1.8	62.5	27.9	7.9	72.1
#30	1.7	1.6	45.4	20.5	7.4	79.5
#50	1.6	1.6	22.7	10.7	9.8	89.3
#100	1.5	1.5	5.4	3.2	7.5	96.8
LBW	1.2	1.4	0.5	1.0	2.2	99.0

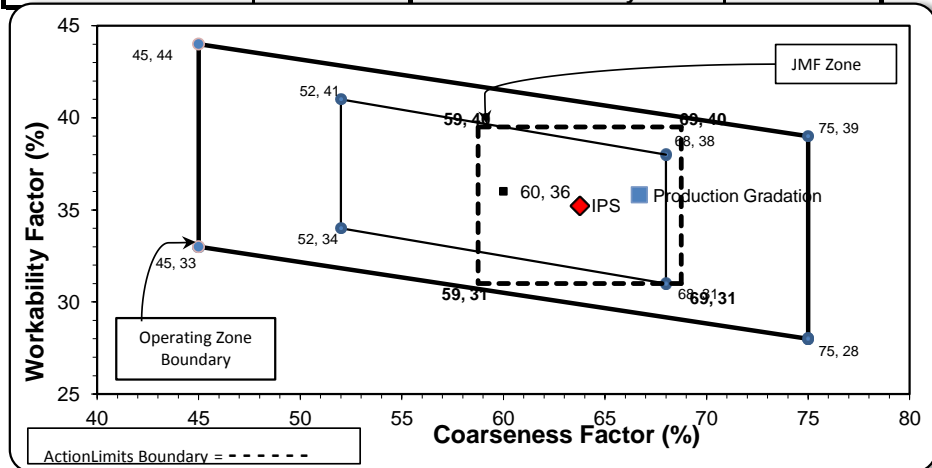


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 \*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor: 67**      **Workability Factor: 36**



Initial Production Sample (IPS)

Coarseness Factor: 64		Workability Factor: 35	
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.4	0.6	0.6
1"	84.3	15.1	15.7
3/4"	73.9	10.4	26.1
1/2"	65.7	8.2	34.3
3/8"	58.7	7.0	41.3
#4	45.1	13.6	54.9
#8	35.3	9.8	64.7
#16	28.1	7.2	71.9
#30	21.2	6.9	78.8
#50	10.1	11.1	89.9
#100	3.1	7.0	96.9
LBW	1.4	1.7	98.6

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 SM, LLC Technical Service

Approved By: