

Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-101**

Sample Date: 6/4/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/5/2018 through 6/11/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1100	6.73	2.62	35.8
IA	71-47	Presque Isle	650	3.98	2.62	21.2
2NS	75-051	Mid-Michigan	1320	7.95	2.66	43.0
Total Wt			3070	18.66		100.0

<----- 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"	55.8	100.0	100.0	84.2	15.8	15.8
3/4"	18.3	100.0	100.0	70.7	13.4	29.3
1/2"	6.4	89.5	100.0	64.2	6.5	35.8
3/8"	4.1	67.8	100.0	58.8	5.4	41.2
#4	2.8	16.0	98.3	46.7	12.2	53.3
#8	2.4	4.6	79.8	36.1	10.5	63.9
#16	2.2	2.6	63.8	28.8	7.4	71.2
#30	2.2	2.2	48.3	22.0	6.7	78.0
#50	2.0	2.0	23.3	11.2	10.9	88.8
#100	1.9	1.8	5.8	3.6	7.6	96.4
LBW	1.6	1.5	0.8	1.2	2.3	98.8

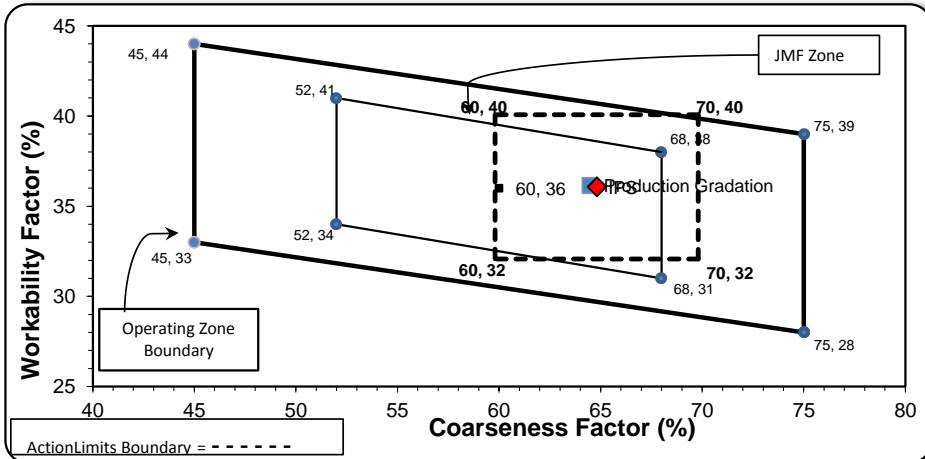


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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:	64	Workability Factor:	36
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Initial Production Sample (IPS)

Coarseness Factor:	65		
Workability Factor:	36		
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: 6/4/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/5/2018 through 6/11/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1170	6.97	2.69	37.5
IA	58-003	Stoneco	750	4.47	2.69	24.0
2NS	38-046	Chelsea	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

<----- 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"	61.5	100.0	100.0	85.6	14.4	14.4
3/4"	46.2	100.0	100.0	79.8	5.7	20.2
1/2"	7.4	94.2	100.0	63.9	15.9	36.1
3/8"	3.1	84.4	100.0	59.9	4.0	40.1
#4	1.4	24.8	100.0	44.9	15.0	55.1
#8	1.1	7.5	88.0	36.1	8.9	63.9
#16	0.9	2.7	65.0	26.0	10.1	74.0
#30	0.8	1.8	42.0	16.9	9.1	83.1
#50	0.8	1.6	20.0	8.4	8.5	91.6
#100	0.8	1.5	3.0	1.8	6.6	98.2
LBW	0.7	1.3	0.8	0.9	0.9	99.1

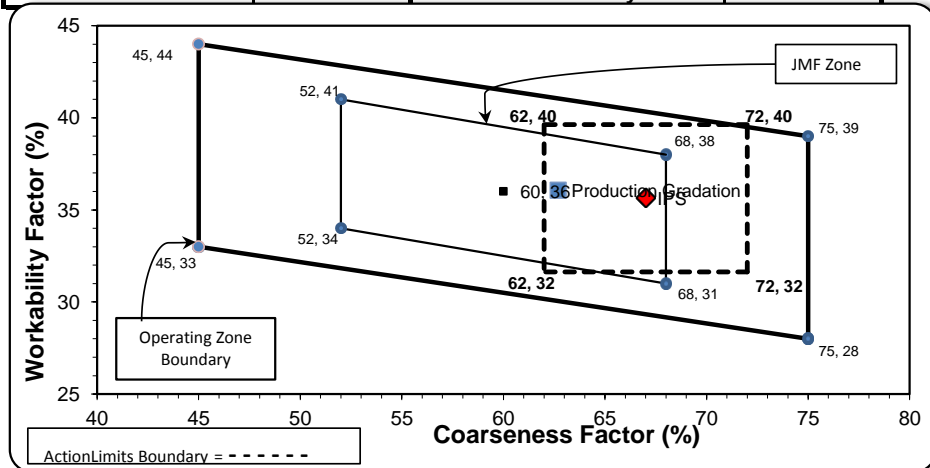


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must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

PREPARED BY:

Approved By:

Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-36**

Sample Date: 6/4/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/5/2018 through 6/11/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-92	AA Grange Hall	1220	7.38	2.65	39.7
Total Wt			3070	18.69		100.0

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



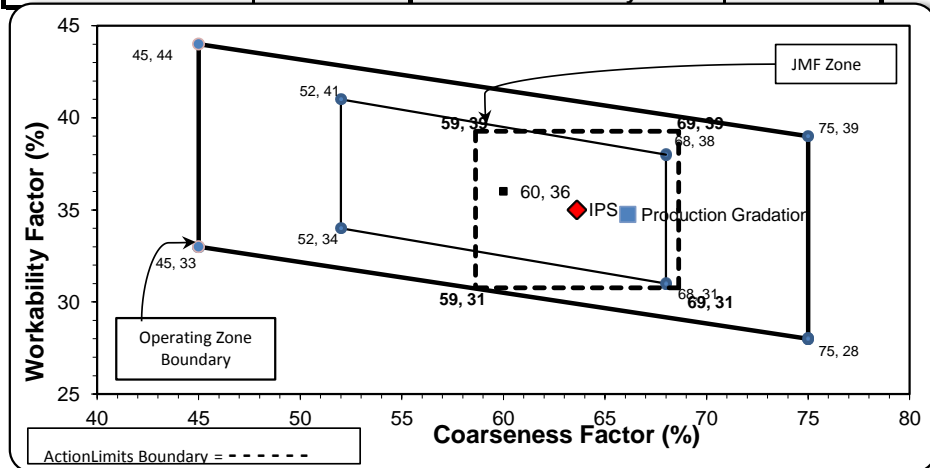
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.4	0.6	0.6
1"	36.0	100.0	100.0	80.2	19.2	19.8
3/4"	5.0	98.5	100.0	70.2	10.0	29.8
1/2"	1.8	82.5	100.0	64.5	5.7	35.5
3/8"	1.7	56.6	100.0	56.9	7.6	43.1
#4	1.7	10.1	97.3	42.2	14.7	57.8
#8	1.7	3.3	83.7	34.8	7.4	65.2
#16	1.6	2.5	67.9	28.2	6.5	71.8
#30	1.6	2.3	48.7	20.5	7.7	79.5
#50	1.5	2.2	22.1	9.9	10.6	90.1
#100	1.4	2.0	2.6	2.1	7.8	97.9
LBW	1.0	1.6	0.2	0.9	1.2	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:	66	Workability Factor:	35
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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

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: P-02

Sample Date: 6/4/18

Concrete Grade: P1M

Contractor: _____

Dates Test Represents: 6/5/2018 through 6/11/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	47-16	Buno Road	1220	7.38	2.65	39.7
Total Wt			3070	18.69		100.0

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



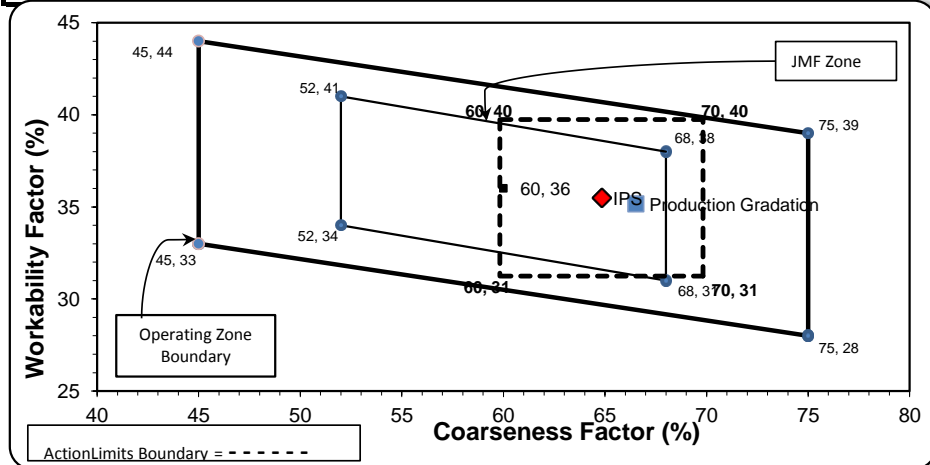
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.4	0.6	0.6
1"	36.0	100.0	100.0	80.2	19.2	19.8
3/4"	5.0	98.5	100.0	70.2	10.0	29.8
1/2"	1.8	82.5	100.0	64.5	5.7	35.5
3/8"	1.7	56.6	100.0	56.9	7.6	43.1
#4	1.7	10.1	95.6	41.5	15.4	58.5
#8	1.7	3.3	84.7	35.2	6.3	64.8
#16	1.6	2.5	71.7	29.7	5.4	70.3
#30	1.6	2.3	53.6	22.5	7.3	77.5
#50	1.5	2.2	21.1	9.5	13.0	90.5
#100	1.4	2.0	3.0	2.2	7.3	97.8
LBW	1.0	1.6	0.5	1.0	1.2	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

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



Initial Production Sample (IPS)

Coarseness Factor: 65		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"	84.0	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

PREPARED BY:
 SM, LLC Technical Service

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