

Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-101**

Sample Date: 7/2/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/3/2018 through 7/9/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
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"	49.5	100.0	100.0	83.6	16.4	16.4
3/4"	13.6	99.1	100.0	71.6	11.9	28.4
1/2"	4.9	84.9	100.0	65.3	6.3	34.7
3/8"	3.5	62.4	100.0	59.4	6.0	40.6
#4	2.9	14.1	99.1	47.0	12.4	53.0
#8	2.6	4.5	83.8	38.0	9.0	62.0
#16	2.4	2.8	69.0	31.1	6.8	68.9
#30	2.2	2.4	51.0	23.2	7.9	76.8
#50	2.1	2.2	22.0	10.7	12.6	89.3
#100	2.0	2.1	4.8	3.2	7.5	96.8
LBW	1.7	1.9	0.7	1.3	1.9	98.7

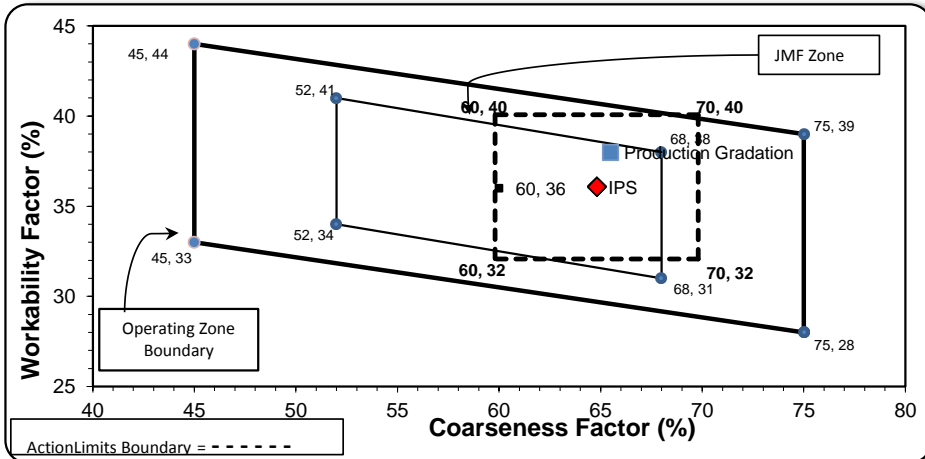


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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: **65** **Workability Factor:** **38**



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: 7/2/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/3/2018 through 7/9/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3120	18.70		100.0

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



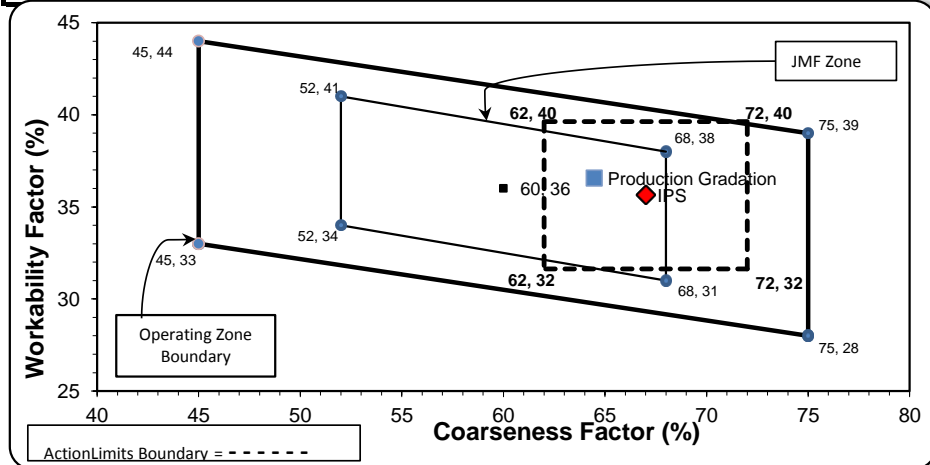
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	63.0	100.0	100.0	84.8	15.2	15.2
3/4"	41.1	100.0	100.0	75.8	9.0	24.2
1/2"	15.8	94.0	100.0	64.2	11.6	35.8
3/8"	8.1	84.4	100.0	59.1	5.1	40.9
#4	4.2	24.7	100.0	45.3	13.8	54.7
#8	2.3	4.9	90.0	36.6	8.7	63.4
#16	2.0	2.1	64.0	25.9	10.7	74.1
#30	1.8	1.6	42.0	17.2	8.6	82.8
#50	1.8	1.4	19.0	8.3	8.9	91.7
#100	1.6	1.3	4.0	2.5	5.9	97.5
LBW	1.5	1.1	1.2	1.3	1.2	98.7

*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:	37
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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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Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-36**

Sample Date: 7/2/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/3/2018 through 7/9/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	930	5.69	2.62	30.3
2NS	63-92	AA Grange Hall	1270	7.68	2.65	41.4
Total Wt			3070	18.69		100.0

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



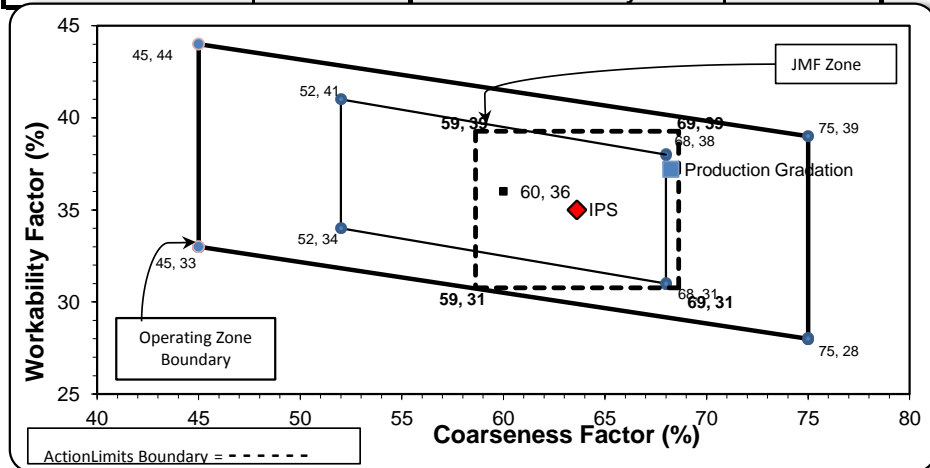
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	51.3	100.0	100.0	86.2	13.8	13.8
3/4"	14.1	97.5	100.0	74.9	11.3	25.1
1/2"	3.0	78.7	100.0	66.1	8.8	33.9
3/8"	1.9	50.3	100.0	57.1	8.9	42.9
#4	1.7	8.2	97.8	43.4	13.7	56.6
#8	1.7	3.1	86.5	37.2	6.2	62.8
#16	1.6	2.5	71.0	30.6	6.6	69.4
#30	1.6	2.4	51.7	22.6	8.0	77.4
#50	1.5	2.3	21.7	10.1	12.5	89.9
#100	1.4	2.2	2.9	2.3	7.8	97.7
LBW	1.1	1.8	0.2	0.9	1.3	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:	68	Workability Factor:	37
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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:
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Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-39**

Sample Date: 7/2/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/3/2018 through 7/9/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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	63-115	Ray Road	1320	7.98	2.65	43.0
Total Wt			3070	18.69		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"	49.5	100.0	100.0	83.6	16.4	16.4
3/4"	13.6	99.1	100.0	71.6	11.9	28.4
1/2"	4.9	84.9	100.0	65.3	6.3	34.7
3/8"	3.5	62.4	100.0	59.4	6.0	40.6
#4	2.9	14.1	96.1	45.7	13.7	54.3
#8	2.6	4.5	77.8	35.4	10.3	64.6
#16	2.4	2.8	60.5	27.5	7.9	72.5
#30	2.2	2.4	45.5	20.9	6.6	79.1
#50	2.1	2.2	25.5	12.2	8.7	87.8
#100	2.0	2.1	7.9	4.6	7.6	95.4
LBW	1.7	1.9	0.8	1.4	3.2	98.6

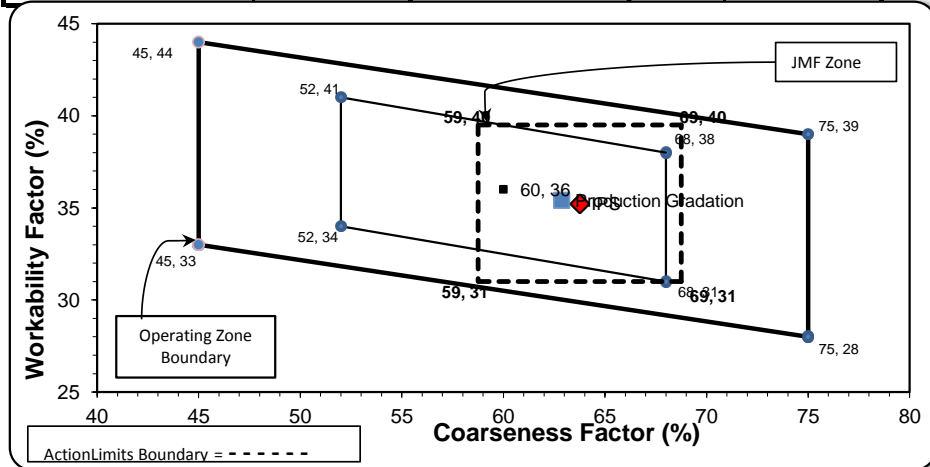
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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



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Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

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



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

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: 7/2/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 7/3/2018 through 7/9/2018

MDOT No.: _____

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

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



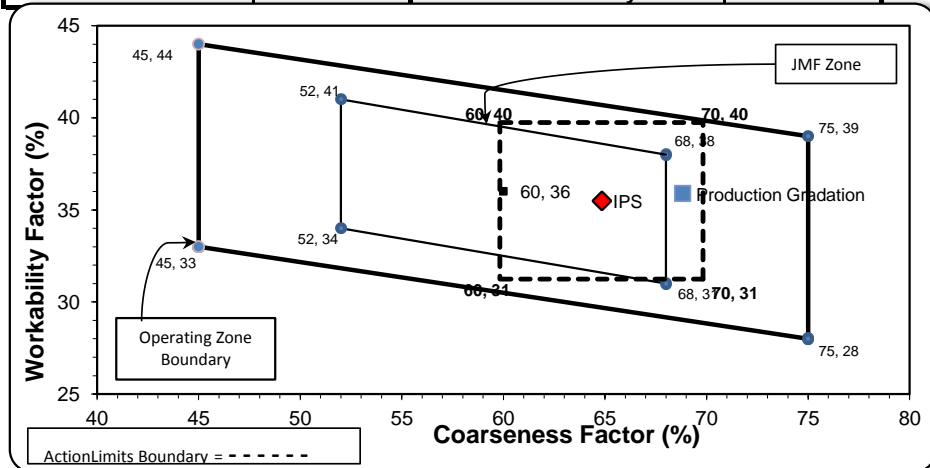
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	51.3	100.0	100.0	85.4	14.6	14.6
3/4"	14.1	97.5	100.0	73.5	11.9	26.5
1/2"	3.0	78.7	100.0	64.6	8.9	35.4
3/8"	1.9	50.3	100.0	55.9	8.7	44.1
#4	1.7	8.2	95.9	41.7	14.2	58.3
#8	1.7	3.1	85.3	35.9	5.8	64.1
#16	1.6	2.5	71.9	30.3	5.6	69.7
#30	1.6	2.4	52.7	22.5	7.8	77.5
#50	1.5	2.3	20.2	9.3	13.2	90.7
#100	1.4	2.2	2.7	2.2	7.1	97.8
LBW	1.1	1.8	0.3	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:	69	Workability Factor:	36
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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

PREPARED BY:
 SM, LLC Technical Service

Approved By: