

Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-101**

Sample Date: 6/11/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/12/2018 through 6/18/2018

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"	96.6	100.0	100.0	98.9	1.1	1.1
1"	46.0	100.0	100.0	82.4	16.5	17.6
3/4"	13.5	98.1	100.0	71.4	11.1	28.6
1/2"	2.7	81.4	100.0	63.8	7.6	36.2
3/8"	2.0	55.3	100.0	57.2	6.6	42.8
#4	1.8	11.1	99.0	45.9	11.3	54.1
#8	1.8	3.6	80.0	35.9	10.0	64.1
#16	1.7	2.4	63.7	28.5	7.3	71.5
#30	1.7	2.0	47.7	21.6	7.0	78.4
#50	1.6	1.9	23.7	11.2	10.4	88.8
#100	1.5	1.7	6.3	3.6	7.6	96.4
LBW	1.1	1.4	1.2	1.2	2.4	98.8



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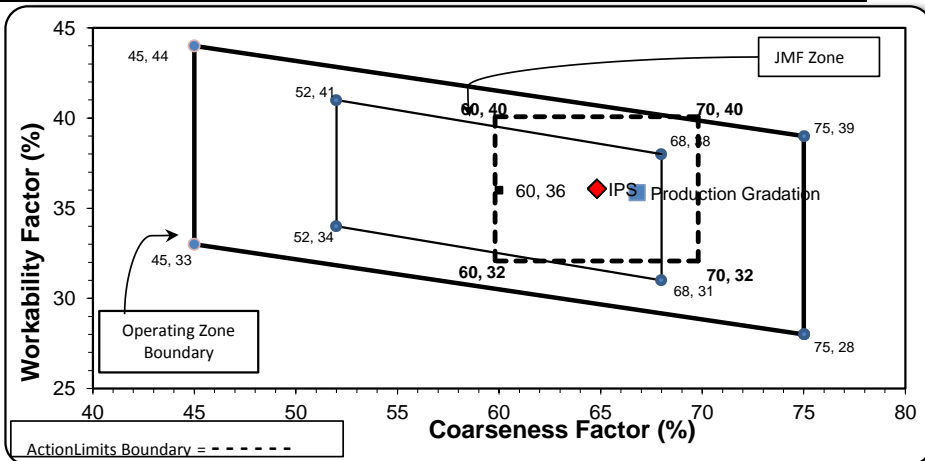
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	67	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: 6/11/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/12/2018 through 6/18/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1320	7.86	2.69	42.3
IA	58-003	Stoneco	600	3.57	2.69	19.2
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"	63.6	100.0	100.0	84.6	15.4	15.4
3/4"	37.7	100.0	100.0	73.6	11.0	26.4
1/2"	13.6	92.3	100.0	62.0	11.7	38.0
3/8"	5.9	81.5	100.0	56.6	5.3	43.4
#4	2.0	20.5	100.0	43.3	13.4	56.8
#8	1.4	4.6	87.0	34.9	8.3	65.1
#16	1.4	2.1	64.0	25.6	9.3	74.4
#30	1.2	1.6	40.0	16.2	9.4	83.8
#50	1.2	1.5	19.0	8.1	8.1	91.9
#100	1.1	1.4	3.0	1.9	6.2	98.1
LBW	1.1	1.2	0.9	1.0	0.8	99.0

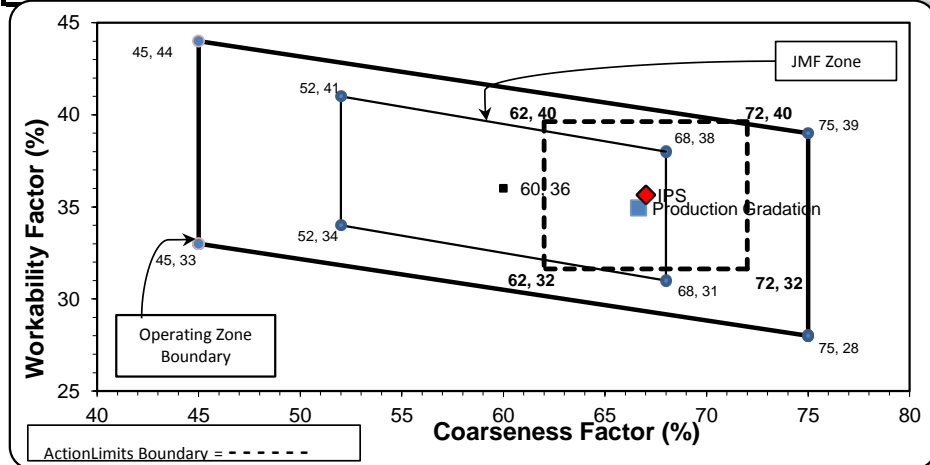


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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: 35**



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: 6/11/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/12/2018 through 6/18/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	875	5.35	2.62	28.5
IA	71-47	Presque Isle	920	5.63	2.62	30.0
2NS	63-92	AA Grange Hall	1275	7.71	2.65	41.5
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"	98.1	100.0	100.0	99.5	0.5	0.5
1"	51.0	100.0	100.0	86.0	13.4	14.0
3/4"	16.6	98.3	100.0	75.7	10.3	24.3
1/2"	5.3	79.6	100.0	66.9	8.8	33.1
3/8"	3.5	45.2	100.0	56.1	10.8	43.9
#4	2.6	5.8	97.1	42.8	13.3	57.2
#8	2.3	2.2	83.5	36.0	6.8	64.0
#16	2.2	1.7	68.0	29.4	6.6	70.6
#30	2.1	1.6	49.6	21.7	7.7	78.3
#50	2.0	1.6	22.5	10.4	11.3	89.6
#100	1.9	1.5	2.9	2.2	8.2	97.8
LBW	1.5	1.2	0.3	0.9	1.3	99.1

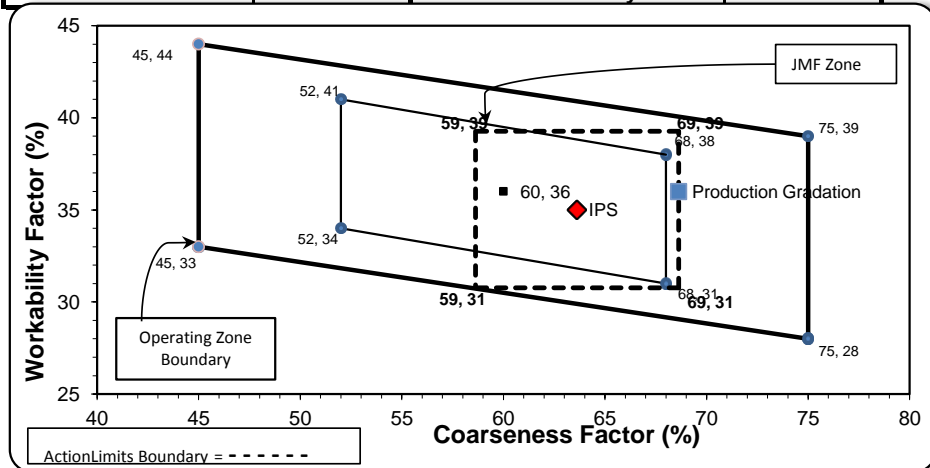


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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: 69 **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"	84.6	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: 6/11/18

Concrete Grade: P1M

Contractor: _____

Dates Test Represents: 6/12/2018 through 6/18/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
Total Wt			3070	18.69		100.0

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



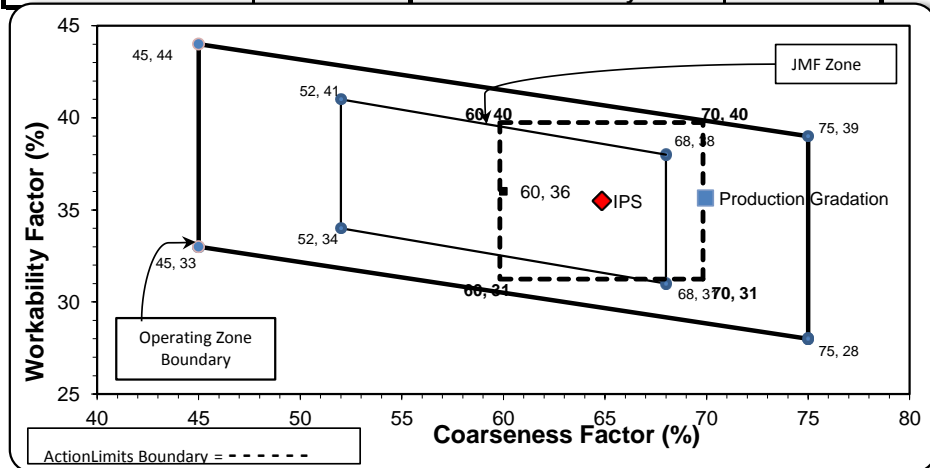
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.4	0.6	0.6
1"	51.0	100.0	100.0	85.5	14.0	14.5
3/4"	16.6	98.3	100.0	74.8	10.7	25.2
1/2"	5.3	79.6	100.0	65.8	9.0	34.2
3/8"	3.5	45.2	100.0	55.0	10.8	45.0
#4	2.6	5.8	95.6	41.1	13.9	58.9
#8	2.3	2.2	84.9	35.6	5.5	64.4
#16	2.2	1.7	71.9	30.2	5.4	69.8
#30	2.1	1.6	53.1	22.5	7.7	77.5
#50	2.0	1.6	19.1	8.8	13.8	91.2
#100	1.9	1.5	2.3	1.9	6.8	98.1
LBW	1.5	1.2	0.5	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

Coarseness Factor:	70	Workability Factor:	36
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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

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