

Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-101**

Sample Date: 6/25/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/26/2018 through 7/2/2018

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"	97.9	100.0	100.0	99.3	0.7	0.7
1"	46.0	100.0	100.0	82.4	16.9	17.6
3/4"	13.0	98.2	100.0	71.2	11.2	28.8
1/2"	3.1	82.5	100.0	64.2	7.1	35.8
3/8"	2.2	56.6	100.0	57.5	6.6	42.5
#4	2.0	12.2	98.9	46.2	11.4	53.8
#8	1.9	3.7	80.4	36.1	10.1	63.9
#16	1.9	2.4	64.0	28.7	7.4	71.3
#30	1.9	2.1	48.2	21.9	6.9	78.1
#50	1.8	1.9	21.9	10.5	11.4	89.5
#100	1.7	1.7	5.0	3.1	7.3	96.9
LBW	1.2	1.5	0.7	1.1	2.1	98.9

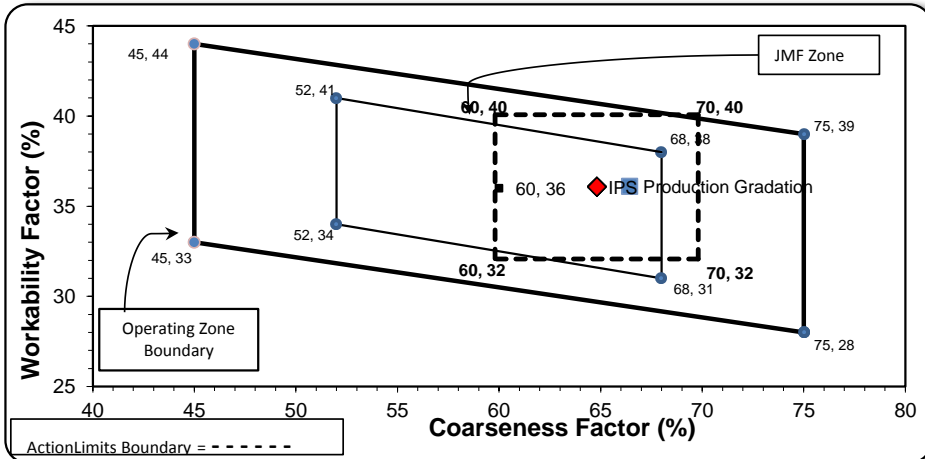


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*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must 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:	66	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: 6/25/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/26/2018 through 7/2/2018

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%

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"	64.6	100.0	100.0	85.5	14.5	14.5
3/4"	37.8	100.0	100.0	74.5	11.0	25.5
1/2"	10.0	94.0	100.0	61.8	12.6	38.2
3/8"	4.1	83.2	100.0	57.2	4.6	42.8
#4	1.7	26.6	100.0	44.6	12.6	55.4
#8	1.4	7.0	89.0	36.2	8.4	63.8
#16	1.2	2.7	62.0	24.9	11.3	75.1
#30	1.1	1.8	41.0	16.6	8.3	83.4
#50	1.1	1.6	18.0	7.7	8.9	92.3
#100	1.0	1.5	4.0	2.3	5.4	97.7
LBW	1.0	1.3	1.1	1.1	1.2	98.9

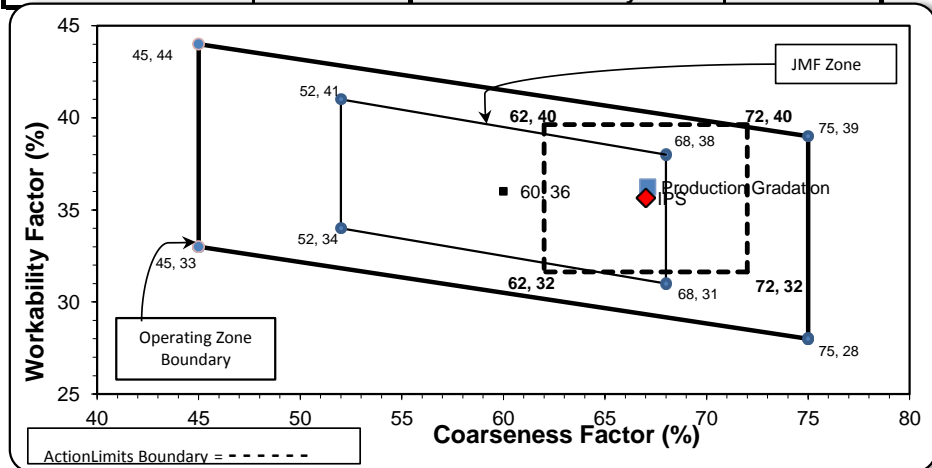


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 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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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Aggregate Optimization Chart

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

Production Gradation Report

PLANT #: **P-36**

Sample Date: 6/25/18

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 6/26/2018 through 7/2/2018

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	900	5.50	2.62	29.3
2NS	63-92	AA Grange Hall	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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



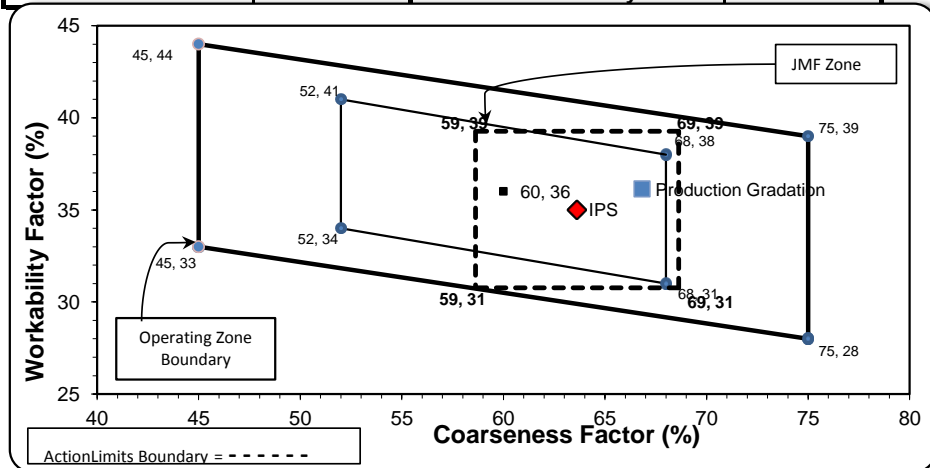
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.1	100.0	100.0	98.5	1.5	1.5
1"	44.3	100.0	100.0	83.3	15.2	16.7
3/4"	9.6	97.1	100.0	72.1	11.2	27.9
1/2"	1.9	80.0	100.0	64.7	7.3	35.3
3/8"	1.7	54.9	100.0	57.3	7.4	42.7
#4	1.6	10.5	97.4	43.2	14.1	56.8
#8	1.6	3.3	85.2	36.1	7.1	63.9
#16	1.6	2.5	70.3	29.8	6.3	70.2
#30	1.6	2.3	52.0	22.3	7.5	77.7
#50	1.5	2.3	24.3	11.0	11.3	89.0
#100	1.4	2.1	3.5	2.5	8.6	97.5
LBW	1.0	1.9	0.3	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

Coarseness Factor:	67	Workability Factor:	36
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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: 6/25/18

Concrete Grade: P1M

Contractor: _____

Dates Test Represents: 6/26/2018 through 7/2/2018

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%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.1	100.0	100.0	98.5	1.5	1.5
1"	44.3	100.0	100.0	83.3	15.2	16.7
3/4"	9.6	97.1	100.0	72.0	11.3	28.0
1/2"	1.9	80.0	100.0	64.7	7.4	35.3
3/8"	1.7	54.9	100.0	57.2	7.5	42.8
#4	1.6	10.5	95.7	42.2	14.9	57.8
#8	1.6	3.3	85.3	35.9	6.3	64.1
#16	1.6	2.5	72.4	30.5	5.4	69.5
#30	1.6	2.3	53.6	22.8	7.7	77.2
#50	1.5	2.3	20.6	9.5	13.4	90.5
#100	1.4	2.1	2.7	2.1	7.3	97.9
LBW	1.0	1.9	0.4	1.0	1.1	99.0

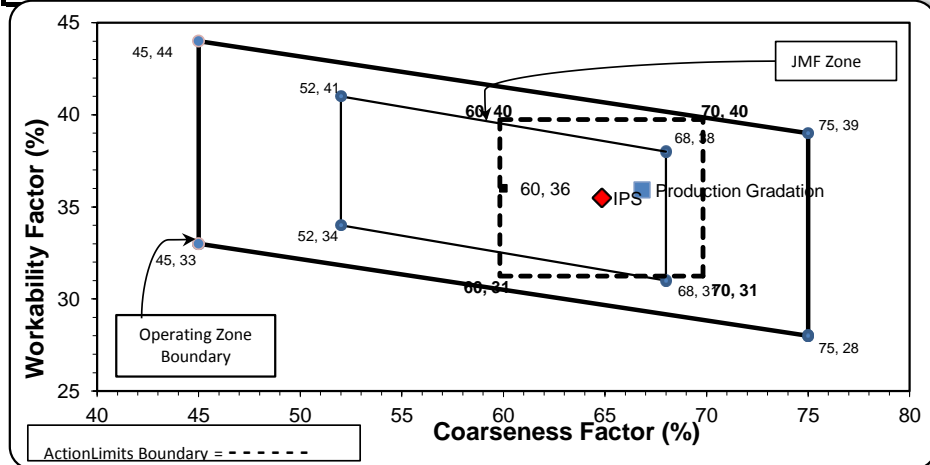


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Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

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



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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