

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-102**

Sample Date: 8/20/18

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 8/21/2018 through 8/27/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1375	8.19	2.69	45.9
26A	58-003	Stoneco	470	2.80	2.69	15.7
2NS	38-046	Chelsea	1150	6.95	2.65	38.4
Total Wt			2995	17.95		100.0

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

Sieve	6AA	26A	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"	99.6	100.0	100.0	99.8	0.2	0.2
3/4"	81.1	100.0	100.0	91.3	8.5	8.7
1/2"	38.2	99.6	100.0	71.6	19.8	28.4
3/8"	15.4	87.0	100.0	59.1	12.4	40.9
#4	2.5	18.3	100.0	42.4	16.7	57.6
#8	1.1	5.2	90.0	35.9	6.5	64.1
#16	0.9	2.8	65.0	25.8	10.1	74.2
#30	0.8	2.2	45.0	18.0	7.8	82.0
#50	0.7	2.0	25.0	10.2	7.8	89.8
#100	0.7	1.9	6.0	2.9	7.3	97.1
LBW	0.5	1.7	1.5	1.1	1.9	98.9



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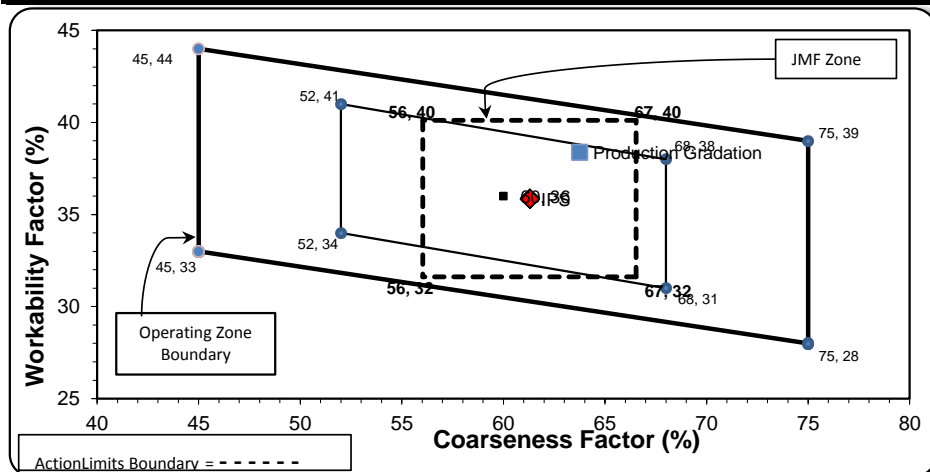
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	36	Adjusted WF	38.4
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Coarseness Factor:	61
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"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-32**

Sample Date: 8/20/18

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 8/21/2018 through 8/27/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1575	9.63	2.62	53.4
26A	71-47	Presque Isle	200	1.22	2.62	6.8
2NS	95-13	Smelter Bay	1175	7.11	2.65	39.8
Total Wt			2950	17.96		100.0

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

Sieve	6AA	26A	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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	79.1	100.0	100.0	88.8	11.2	11.2
1/2"	46.0	96.0	100.0	70.9	17.9	29.1
3/8"	25.8	84.6	100.0	59.3	11.6	40.7
#4	3.0	23.1	97.0	41.8	17.5	58.2
#8	1.1	7.7	83.7	34.4	7.4	65.6
#16	0.9	4.4	68.3	28.0	6.5	72.0
#30	0.8	3.4	49.6	20.4	7.6	79.6
#50	0.7	3.0	23.8	10.1	10.4	89.9
#100	0.6	2.7	4.2	2.2	7.9	97.8
LBW	0.4	1.8	0.6	0.6	1.6	99.4



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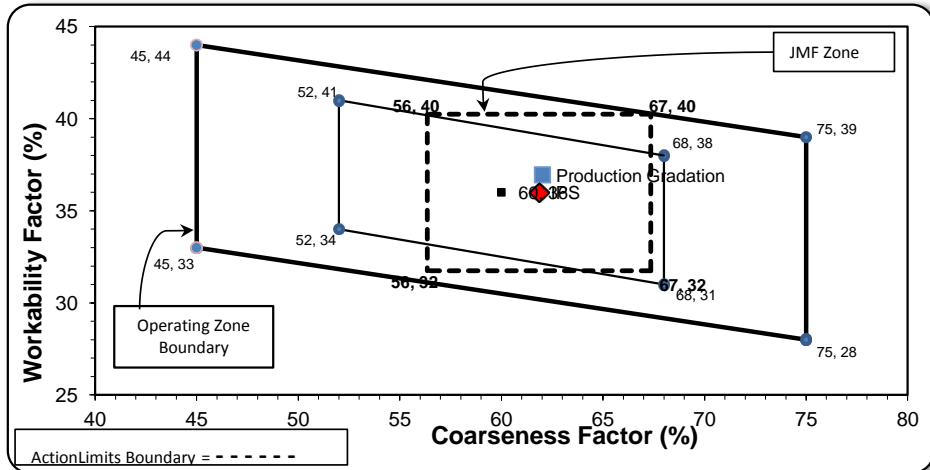
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	62	Workability Factor:	34
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Coarseness Factor:	62
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"	100.0	0.0	0.0
3/4"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-35**

Sample Date: 8/20/18

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 8/21/2018 through 8/27/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1390	8.28	2.69	46.5
26A	58-003	Stoneco	350	2.09	2.69	11.7
2NS	81-93	Burmeister	1250	7.59	2.64	41.8
Total Wt			2990	17.95		100.0

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

Sieve	6AA	26A	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"	99.6	100.0	100.0	99.8	0.2	0.2
3/4"	81.1	100.0	100.0	91.2	8.6	8.8
1/2"	38.2	99.6	100.0	71.2	20.0	28.8
3/8"	15.4	87.0	100.0	59.1	12.1	40.9
#4	2.5	18.3	98.7	44.6	14.6	55.4
#8	1.1	5.2	82.6	35.7	8.9	64.3
#16	0.9	2.8	63.5	27.3	8.4	72.7
#30	0.8	2.2	42.2	18.3	9.0	81.7
#50	0.7	2.0	17.0	7.7	10.6	92.3
#100	0.7	1.9	3.2	1.9	5.8	98.1
LBW	0.5	1.7	0.9	0.8	1.1	99.2



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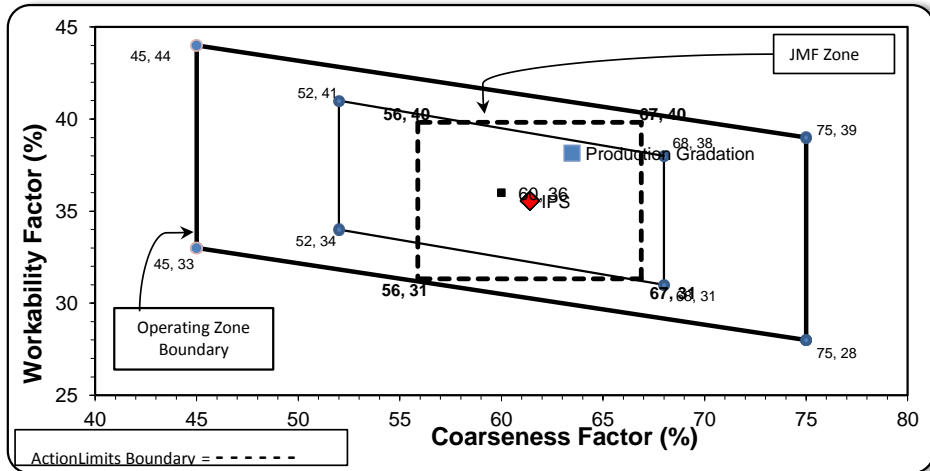
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	36	Adjusted WF	38.2
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Coarseness Factor:	61
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"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

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Approved By:

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-36**

Sample Date: 8/20/18

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 8/21/2018 through 8/27/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1600	9.79	2.62	54.2
26A	71-47	Presque Isle	200	1.22	2.62	6.8
2NS	63-92	AA Grange Hall	1150	6.95	2.65	39.0
Total Wt			2950	17.96		100.0

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

Sieve	6AA	26A	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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	82.5	100.0	100.0	90.5	9.5	9.5
1/2"	45.5	96.0	100.0	70.2	20.3	29.8
3/8"	24.4	84.6	100.0	58.0	12.2	42.0
#4	2.5	23.1	96.8	40.7	17.3	59.3
#8	1.4	7.7	82.9	33.6	7.1	66.4
#16	1.2	4.4	67.4	27.2	6.4	72.8
#30	1.2	3.4	49.9	20.3	6.9	79.7
#50	1.1	3.0	24.7	10.4	9.9	89.6
#100	1.1	2.7	4.2	2.4	8.0	97.6
LBW	0.9	1.8	0.4	0.8	1.7	99.2



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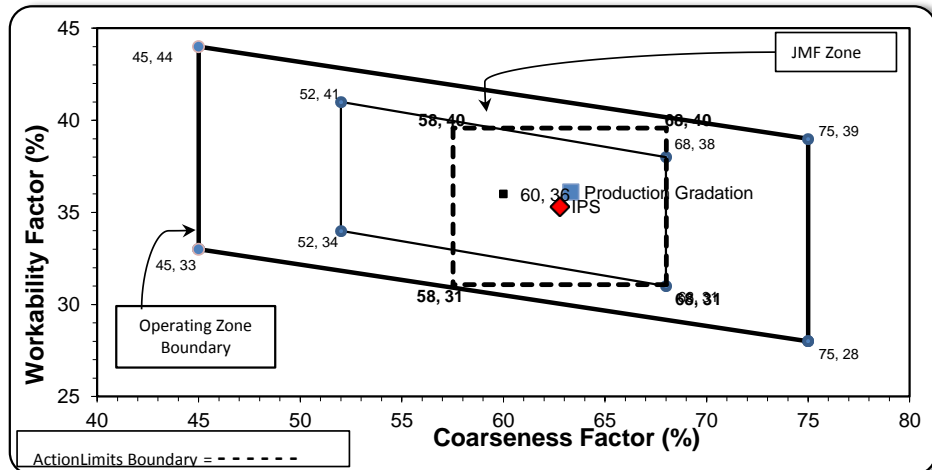
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	34	Adjusted WF	36.1
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Coarseness Factor:	63
Workability Factor:	35



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.9	0.1	0.1
3/4"	89.1	10.8	10.9
1/2"	71.3	17.8	28.7
3/8"	59.4	11.9	40.6
#4	42.6	16.8	57.4
#8	35.3	7.3	64.7
#16	28.5	6.8	71.5
#30	20.9	7.6	79.1
#50	9.0	12.0	91.0
#100	1.7	7.3	98.3
LBW	0.7	1.0	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: P-02

Sample Date: 8/20/18

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 8/21/2018 through 8/27/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1600	9.79	2.62	54.2
26A	71-47	Presque Isle	200	1.22	2.62	6.8
2NS	63-92	AA Grange Hall	1150	6.95	2.65	39.0
Total Wt			2950	17.96		100.0

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

Sieve	6AA	26A	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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	82.5	100.0	100.0	90.5	9.5	9.5
1/2"	45.5	96.0	100.0	70.2	20.3	29.8
3/8"	24.4	84.6	100.0	58.0	12.2	42.0
#4	2.5	23.1	96.8	40.7	17.3	59.3
#8	1.4	7.7	82.9	33.6	7.1	66.4
#16	1.2	4.4	67.4	27.2	6.4	72.8
#30	1.2	3.4	49.9	20.3	6.9	79.7
#50	1.1	3.0	24.7	10.4	9.9	89.6
#100	1.1	2.7	4.2	2.4	8.0	97.6
LBW	0.9	1.8	0.4	0.8	1.7	99.2



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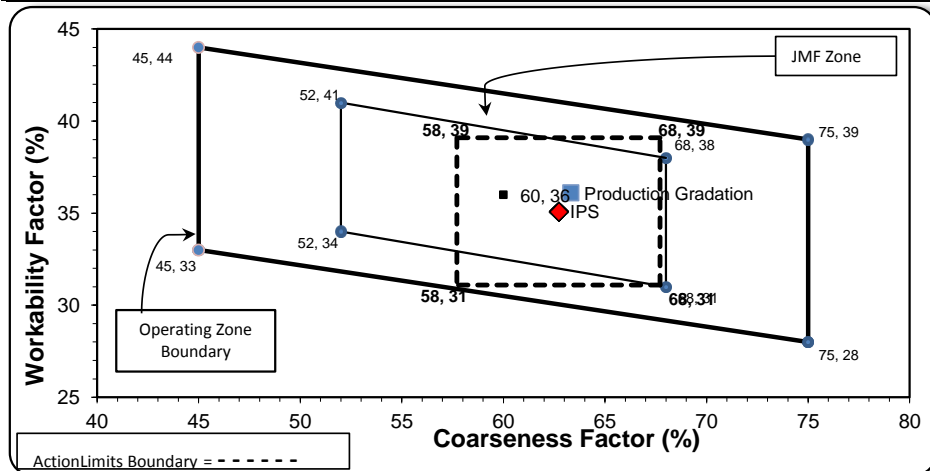
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	34	Adjusted WF	36.1
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Coarseness Factor:	63
Workability Factor:	35



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.1	4.9	4.9
1/2"	74.6	20.5	25.4
3/8"	59.3	15.3	40.7
#4	42.1	17.2	57.9
#8	35.1	7.1	64.9
#16	29.2	5.9	70.8
#30	21.9	7.3	78.1
#50	9.6	12.4	90.4
#100	2.4	7.2	97.6
LBW	0.9	1.5	99.1

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 SM, LLC Technical Service

Approved By: