

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-102**

Sample Date: 10/15/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 10/16/2018 through 10/22/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.1
26A	58-003	Stoneco	345	2.06	2.69	11.5
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"	99.9	100.0	100.0	99.9	0.1	0.1
3/4"	84.5	100.0	100.0	92.2	7.7	7.8
1/2"	44.9	99.7	100.0	72.4	19.9	27.6
3/8"	20.5	87.9	100.0	58.8	13.6	41.2
#4	3.1	17.7	100.0	42.0	16.8	58.0
#8	1.4	4.4	88.0	35.0	7.0	65.0
#16	1.0	1.9	64.0	25.3	9.7	74.7
#30	0.8	1.4	43.0	17.1	8.2	82.9
#50	0.8	1.2	22.0	9.0	8.1	91.0
#100	0.7	1.2	5.0	2.4	6.6	97.6
LBW	0.8	1.0	0.6	0.7	1.7	99.3

*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.



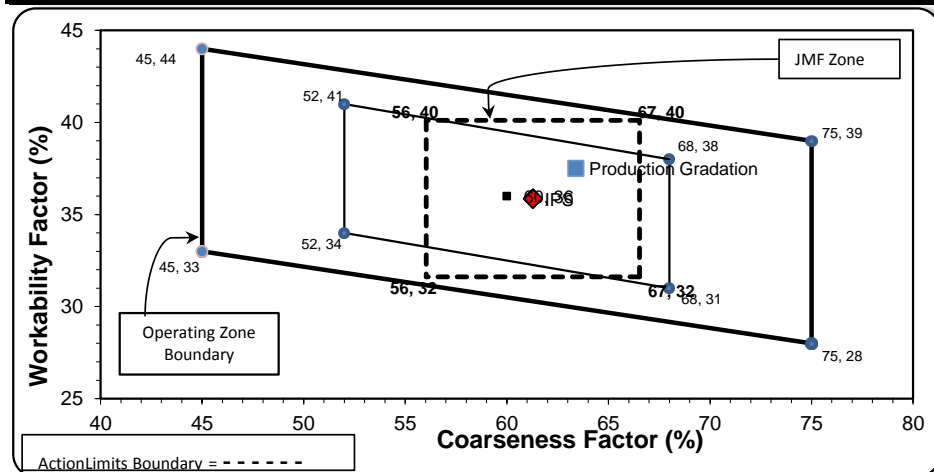
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	35	37.5
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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: 10/15/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 10/16/2018 through 10/22/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	50.8
26A	71-47	Presque Isle	300	1.83	2.62	10.2
2NS	95-13	Smelter Bay	1150	6.95	2.65	39.0
Total Wt			2950	17.96		100.0

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



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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"	99.3	100.0	100.0	99.6	0.4	0.4
3/4"	78.5	100.0	100.0	89.1	10.6	10.9
1/2"	41.2	95.9	100.0	69.7	19.4	30.3
3/8"	17.8	81.4	100.0	56.3	13.4	43.7
#4	2.3	18.3	97.7	41.1	15.2	58.9
#8	1.6	5.9	85.9	34.9	6.2	65.1
#16	1.5	3.6	68.0	27.6	7.3	72.4
#30	1.4	3.0	45.6	18.8	8.8	81.2
#50	1.4	2.7	18.4	8.2	10.6	91.8
#100	1.3	2.5	3.7	2.4	5.8	97.6
LBW	1.0	1.9	0.7	1.0	1.4	99.0

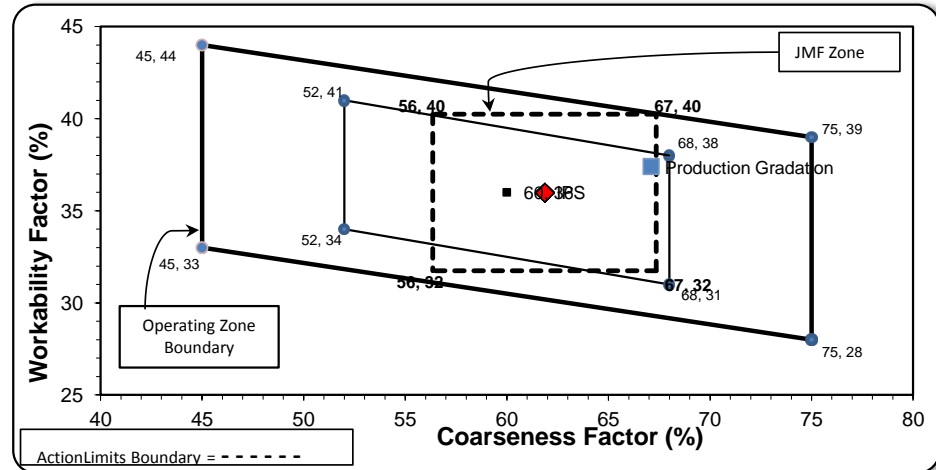
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	67	Workability Factor:	35	37.4
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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: 10/15/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 10/16/2018 through 10/22/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1540	9.17	2.69	51.5
26A	58-003	Stoneco	300	1.79	2.69	10.0
2NS	81-93	Burmeister	1150	6.98	2.64	38.5
Total Wt			2990	17.94		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"	99.9	100.0	100.0	99.9	0.1	0.1
3/4"	84.5	100.0	100.0	92.0	7.9	8.0
1/2"	44.9	99.7	100.0	71.6	20.4	28.4
3/8"	20.5	87.9	100.0	57.8	13.8	42.2
#4	3.1	17.7	98.2	41.1	16.7	58.9
#8	1.4	4.4	82.8	33.0	8.1	67.0
#16	1.0	1.9	64.8	25.6	7.4	74.4
#30	0.8	1.4	45.7	18.1	7.5	81.9
#50	0.8	1.2	18.4	7.6	10.5	92.4
#100	0.7	1.2	3.4	1.8	5.8	98.2
LBW	0.8	1.0	1.0	0.9	0.9	99.1



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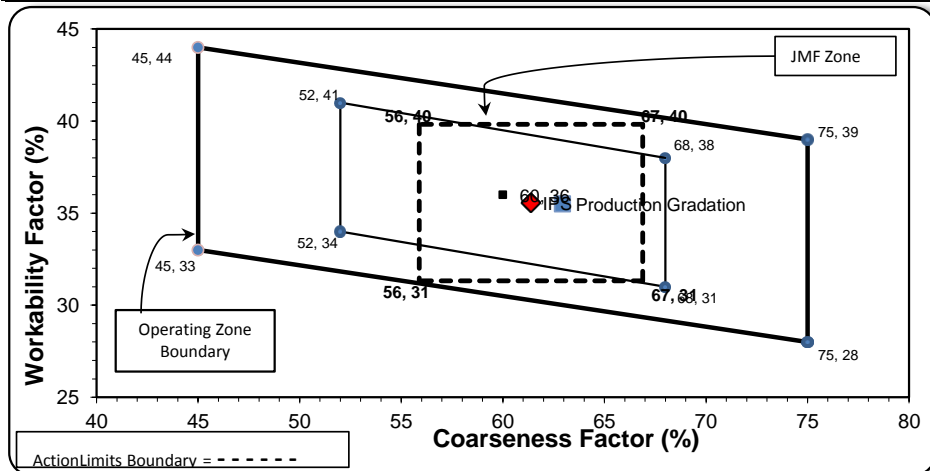
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	33	Adjusted WF	35.5
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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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Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-36**

Sample Date: 10/15/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 10/16/2018 through 10/22/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	50.8
26A	71-47	Presque Isle	300	1.83	2.62	10.2
2NS	63-92	AA Grange Hall	1150	6.95	2.65	39.0
Total Wt			2950	17.96		100.0

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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"	99.0	100.0	100.0	99.5	0.5	0.5
3/4"	82.1	100.0	100.0	90.9	8.6	9.1
1/2"	40.7	95.9	100.0	69.4	21.5	30.6
3/8"	21.3	81.4	100.0	58.1	11.3	41.9
#4	3.8	18.3	96.9	41.6	16.5	58.4
#8	2.3	5.9	84.3	34.6	6.9	65.4
#16	2.1	3.6	69.6	28.6	6.1	71.4
#30	2.0	3.0	52.3	21.7	6.9	78.3
#50	1.9	2.7	24.6	10.8	10.9	89.2
#100	1.8	2.5	3.3	2.5	8.4	97.5
LBW	1.4	1.9	0.3	1.0	1.4	99.0

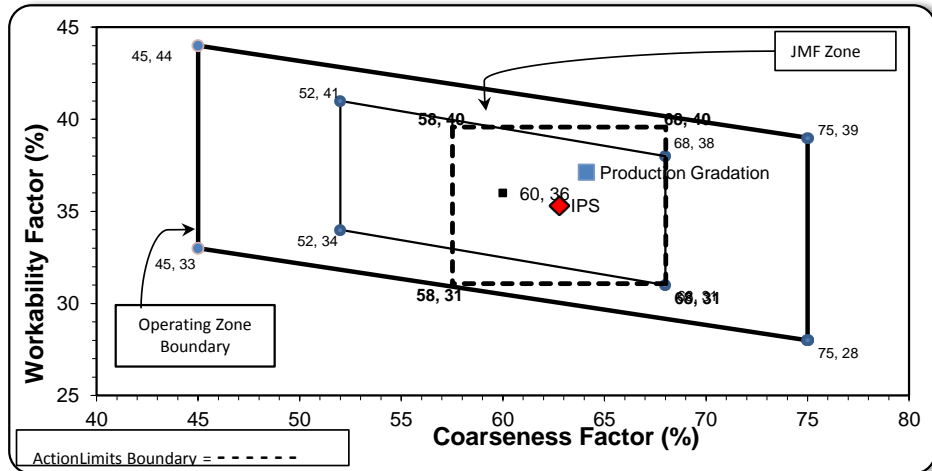
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	35	Adjusted WF	37.1
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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: 10/15/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 10/16/2018 through 10/22/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	50.8
26A	71-47	Presque Isle	300	1.83	2.62	10.2
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"	99.0	100.0	100.0	99.5	0.5	0.5
3/4"	82.1	100.0	100.0	90.9	8.6	9.1
1/2"	40.7	95.9	100.0	69.4	21.5	30.6
3/8"	21.3	81.4	100.0	58.1	11.3	41.9
#4	3.8	18.3	96.9	41.6	16.5	58.4
#8	2.3	5.9	84.3	34.6	6.9	65.4
#16	2.1	3.6	69.6	28.6	6.1	71.4
#30	2.0	3.0	52.3	21.7	6.9	78.3
#50	1.9	2.7	24.6	10.8	10.9	89.2
#100	1.8	2.5	3.3	2.5	8.4	97.5
LBW	1.4	1.9	0.3	1.0	1.4	99.0



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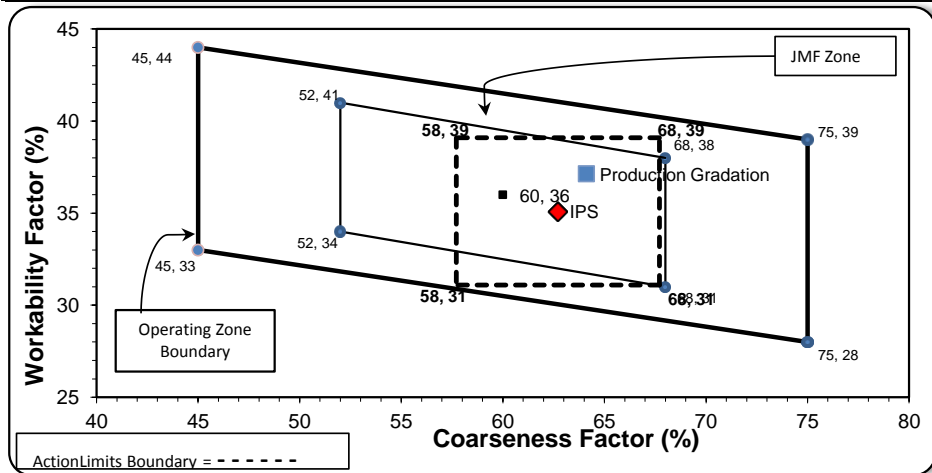
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	35	Adjusted WF	37.1
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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

PREPARED BY:
 SM, LLC Technical Service

Approved By: