

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-102**

Sample Date: 12/3/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1475	8.79	2.69	49.2
26A	58-003	Stoneco	400	2.38	2.69	13.4
2NS	47-16	Buno Rd	1120	6.77	2.65	37.4
Total Wt			2995	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"	99.7	100.0	100.0	99.9	0.1	0.1
3/4"	82.7	100.0	100.0	91.5	8.4	8.5
1/2"	43.3	99.6	100.0	72.0	19.5	28.0
3/8"	20.6	86.4	100.0	59.1	12.9	40.9
#4	4.6	19.8	96.2	40.9	18.2	59.1
#8	2.4	6.2	86.4	34.3	6.6	65.7
#16	1.8	3.0	73.3	28.7	5.6	71.3
#30	1.7	2.4	54.2	21.4	7.3	78.6
#50	1.6	2.0	19.2	8.2	13.2	91.8
#100	1.5	1.9	2.4	1.9	6.3	98.1
LBW	1.3	1.6	0.3	1.0	0.9	99.0



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

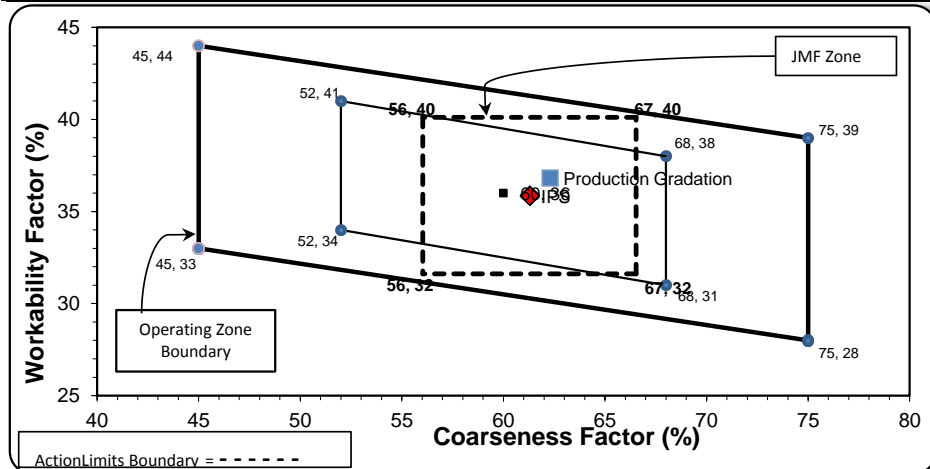
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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	Adjusted WF	36.8
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

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: 12/3/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1300	7.95	2.62	44.1
26A	71-47	Presque Isle	500	3.06	2.62	16.9
2NS	95-13	Smelter Bay	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"	86.0	100.0	100.0	93.8	6.2	6.2
1/2"	39.6	96.5	100.0	72.8	21.0	27.2
3/8"	18.4	74.9	100.0	59.8	13.0	40.2
#4	2.8	5.0	98.1	40.3	19.5	59.7
#8	2.0	1.4	85.7	34.5	5.8	65.5
#16	1.8	1.0	69.2	27.9	6.6	72.1
#30	1.8	0.9	48.7	19.9	8.0	80.1
#50	1.6	0.8	20.7	8.9	11.0	91.1
#100	1.6	0.7	3.9	2.3	6.6	97.7
LBW	1.1	0.5	0.6	0.8	1.5	99.2



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

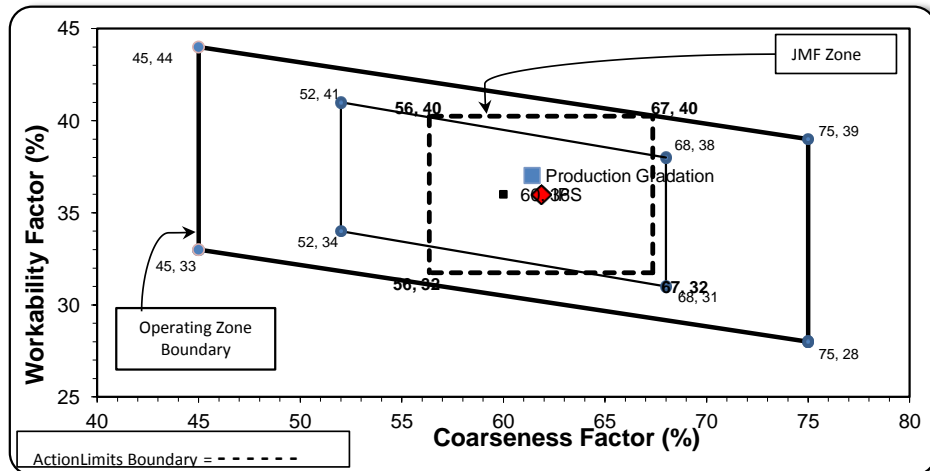
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	61	Workability Factor:	35	Adjusted WF	37.0
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

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: 12/3/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1475	8.79	2.69	49.2
26A	58-003	Stoneco	400	2.38	2.69	13.4
2NS	47-16	Buno Rd	1120	6.77	2.65	37.4
Total Wt			2995	17.94		100.0

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



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

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"	99.7	100.0	100.0	99.9	0.1	0.1
3/4"	82.7	100.0	100.0	91.5	8.4	8.5
1/2"	43.3	99.6	100.0	72.0	19.5	28.0
3/8"	20.6	86.4	100.0	59.1	12.9	40.9
#4	4.6	19.8	96.2	40.9	18.2	59.1
#8	2.4	6.2	86.4	34.3	6.6	65.7
#16	1.8	3.0	73.3	28.7	5.6	71.3
#30	1.7	2.4	54.2	21.4	7.3	78.6
#50	1.6	2.0	19.2	8.2	13.2	91.8
#100	1.5	1.9	2.4	1.9	6.3	98.1
LBW	1.3	1.6	0.3	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.

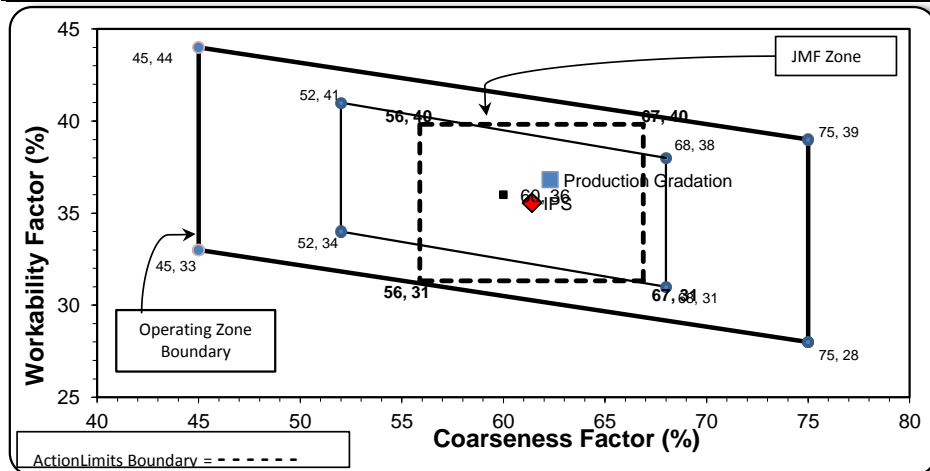
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	62	Workability Factor:	34	Adjusted WF	36.8
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

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



PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

MIX ID'S: DDD0K7E7, DDD0K7E8 and DDD0K7E9

Production Gradation Report

PLANT #: **P-36**

Sample Date: 12/3/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	47.5
26A	71-47	Presque Isle	400	2.45	2.62	13.6
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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	86.4	100.0	100.0	93.5	6.4	6.5
1/2"	38.7	96.5	100.0	70.4	23.1	29.6
3/8"	15.0	74.9	100.0	56.3	14.2	43.7
#4	2.1	5.0	97.7	39.8	16.5	60.2
#8	1.4	1.4	85.0	34.0	5.8	66.0
#16	1.2	1.0	69.0	27.6	6.4	72.4
#30	1.1	0.9	48.1	19.4	8.2	80.6
#50	1.1	0.8	18.6	7.9	11.5	92.1
#100	1.0	0.7	2.6	1.6	6.3	98.4
LBW	0.7	0.5	0.3	0.5	1.1	99.5



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

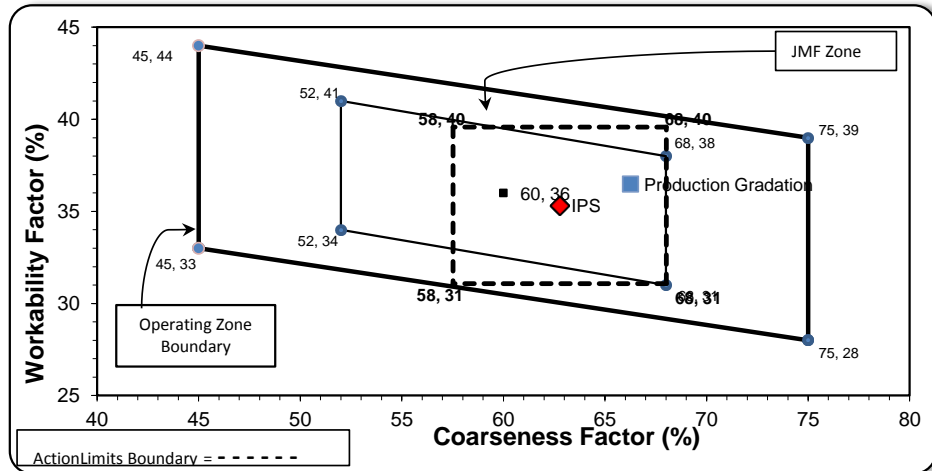
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	34	Adjusted WF	36.5
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

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: 12/3/18

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	47.5
26A	71-47	Presque Isle	400	2.45	2.62	13.6
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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	86.4	100.0	100.0	93.5	6.4	6.5
1/2"	38.7	96.5	100.0	70.4	23.1	29.6
3/8"	15.0	74.9	100.0	56.3	14.2	43.7
#4	2.1	5.0	97.7	39.8	16.5	60.2
#8	1.4	1.4	85.0	34.0	5.8	66.0
#16	1.2	1.0	69.0	27.6	6.4	72.4
#30	1.1	0.9	48.1	19.4	8.2	80.6
#50	1.1	0.8	18.6	7.9	11.5	92.1
#100	1.0	0.7	2.6	1.6	6.3	98.4
LBW	0.7	0.5	0.3	0.5	1.1	99.5



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

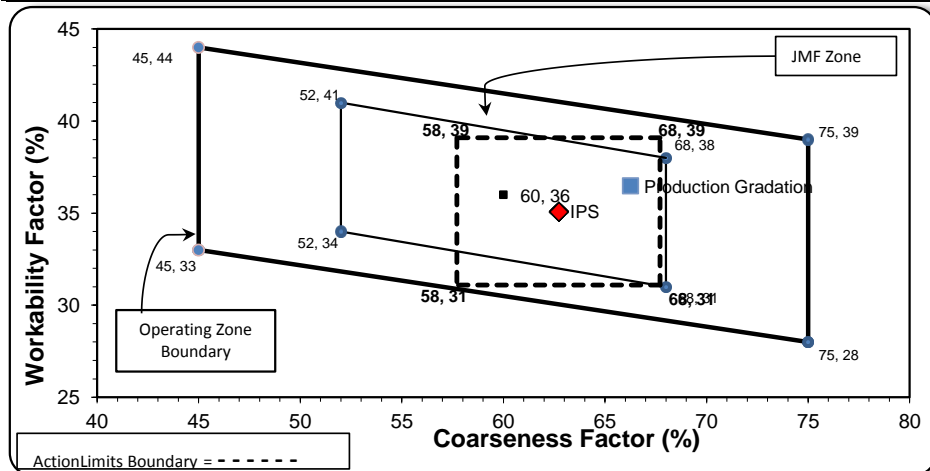
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	34	Adjusted WF	36.5
---------------------------	-----------	----------------------------	-----------	--------------------	-------------

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: