

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 4/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 4/11/2023 through 4/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.8
26A	58-003	Stoneco	300	1.79	2.69	10.2
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	84.2	100.0	100.0	92.0	8.0	8.0
1/2"	43.8	100.0	100.0	71.4	20.5	28.6
3/8"	19.9	92.6	100.0	58.5	12.9	41.5
#4	2.2	13.7	96.8	40.2	18.3	59.8
#8	0.8	3.7	82.4	32.9	7.3	67.1
#16	0.6	2.6	66.4	26.5	6.5	73.5
#30	0.6	2.2	48.8	19.6	6.9	80.4
#50	0.6	2.1	23.5	9.7	9.9	90.3
#100	0.6	2.0	6.5	3.0	6.6	97.0
LBW	0.5	1.9	1.3	1.0	2.1	99.0

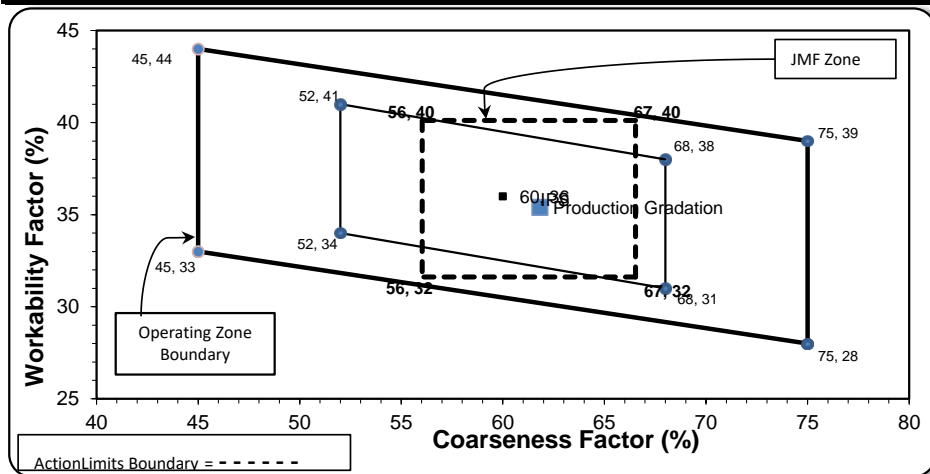
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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:	33	35.4	Coarseness Factor:	61
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Workability Factor:	36
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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

PLANT #: **P-103**

Sample Date: 4/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 4/11/2023 through 4/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.8
26A	58-003	Stoneco	300	1.79	2.69	10.2
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	84.2	100.0	100.0	92.0	8.0	8.0
1/2"	43.8	100.0	100.0	71.4	20.5	28.6
3/8"	19.9	92.6	100.0	58.5	12.9	41.5
#4	2.2	13.7	96.8	40.2	18.3	59.8
#8	0.8	3.7	82.4	32.9	7.3	67.1
#16	0.6	2.6	66.4	26.5	6.5	73.5
#30	0.6	2.2	48.8	19.6	6.9	80.4
#50	0.6	2.1	23.5	9.7	9.9	90.3
#100	0.6	2.0	6.5	3.0	6.6	97.0
LBW	0.5	1.9	1.3	1.0	2.1	99.0

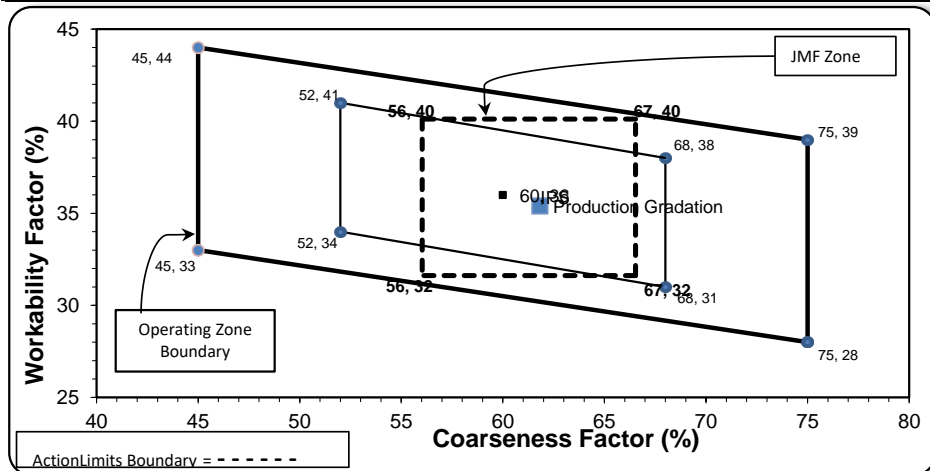
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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:	33	35.4
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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

PLANT #: 12

Sample Date: 4/10/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 4/11/2023 through 4/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1555	9.51	2.62	53.5
26A	71-47	Presque Isle	200	1.22	2.62	6.9
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		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"	95.4	100.0	100.0	97.5	2.5	2.5
3/4"	70.5	100.0	100.0	84.2	13.3	15.8
1/2"	33.0	95.3	100.0	63.8	20.4	36.2
3/8"	21.9	84.4	100.0	57.1	6.7	42.9
#4	3.2	17.3	96.9	41.3	15.9	58.7
#8	1.7	4.7	81.2	33.4	7.9	66.6
#16	1.5	2.4	65.8	27.0	6.4	73.0
#30	1.3	1.9	49.7	20.5	6.5	79.5
#50	1.2	1.8	25.8	11.0	9.5	89.0
#100	1.1	1.7	3.3	2.0	9.0	98.0
LBW	0.9	1.5	0.6	0.8	1.2	99.2

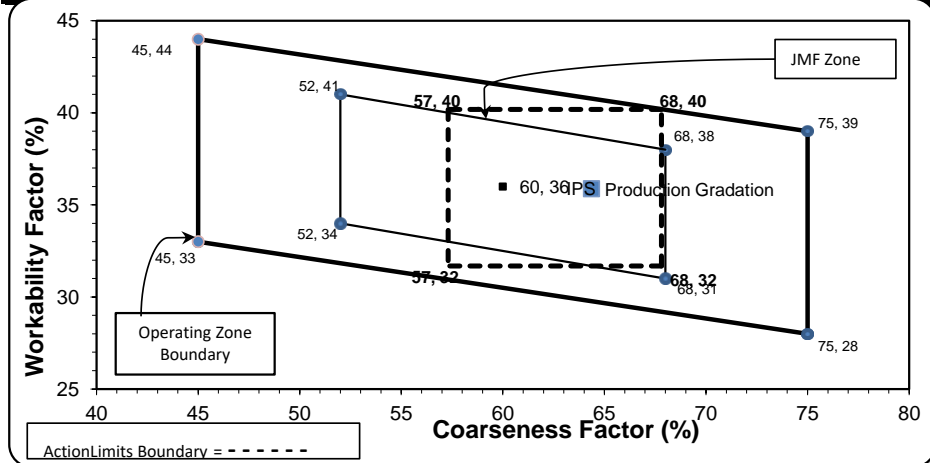
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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: **33** **35.9** Coarseness Factor: **63**

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"	89.0	10.3	11.0
1/2"	70.3	18.7	29.7
3/8"	59.9	10.4	40.1
#4	41.9	18.0	58.1
#8	35.9	6.0	64.1
#16	27.8	8.2	72.2
#30	18.9	8.8	81.1
#50	6.3	12.6	93.7
#100	1.7	4.6	98.3
LBW	1.0	0.7	99.0

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 SM, LLC Technical Service

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Aggregate Optimization Chart

PLANT #: p11

Sample Date: 4/10/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 4/11/2023 through 4/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1405	8.59	2.62	48.4
26A	71-47	Presque Isle	350	2.14	2.62	12.0
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		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"	96.8	100.0	100.0	98.5	1.5	1.5
3/4"	73.6	100.0	100.0	87.2	11.2	12.8
1/2"	34.4	95.3	100.0	67.7	19.5	32.3
3/8"	20.1	84.4	100.0	59.5	8.2	40.5
#4	3.3	17.3	96.7	42.0	17.5	58.0
#8	1.8	4.7	84.4	34.8	7.1	65.2
#16	1.7	2.4	69.4	28.6	6.3	71.4
#30	1.6	1.9	51.2	21.3	7.3	78.7
#50	1.6	1.8	25.2	11.0	10.3	89.0
#100	1.5	1.7	6.5	3.5	7.5	96.5
LBW	1.3	1.5	0.8	1.1	2.4	98.9

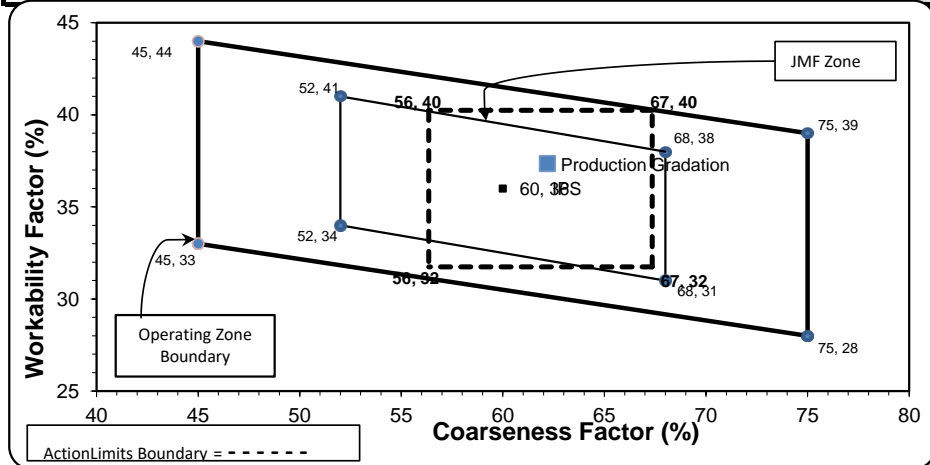
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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: **35** **37.3** 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

PLANT #: **P-32**

Sample Date: 4/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 4/11/2023 through 4/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1405	8.59	2.62	48.4
26A	71-47	Presque Isle	350	2.14	2.62	12.0
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		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"	96.8	100.0	100.0	98.5	1.5	1.5
3/4"	73.6	100.0	100.0	87.2	11.2	12.8
1/2"	34.4	95.3	100.0	67.7	19.5	32.3
3/8"	20.1	84.4	100.0	59.5	8.2	40.5
#4	3.3	17.3	96.7	42.0	17.5	58.0
#8	1.8	4.7	84.4	34.8	7.1	65.2
#16	1.7	2.4	69.4	28.6	6.3	71.4
#30	1.6	1.9	51.2	21.3	7.3	78.7
#50	1.6	1.8	25.2	11.0	10.3	89.0
#100	1.5	1.7	6.5	3.5	7.5	96.5
LBW	1.3	1.5	0.8	1.1	2.4	98.9

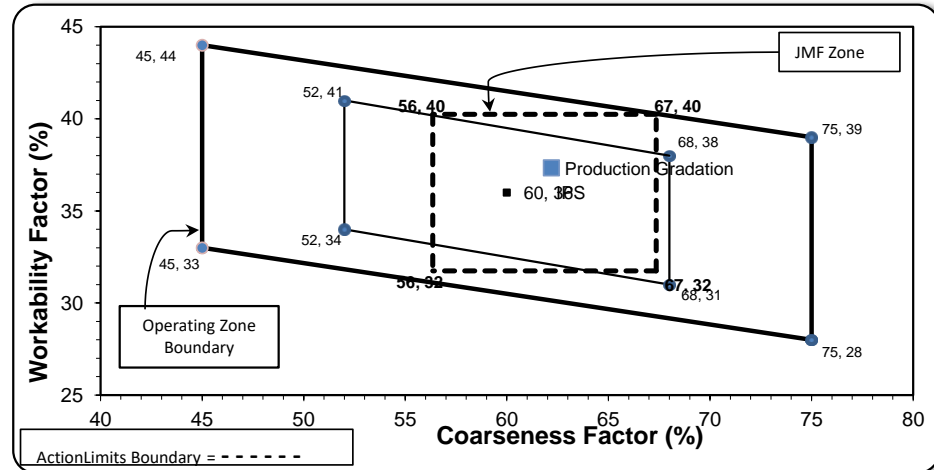
*Maximum % Retained must be above the 3/8" sieve.
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 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	62	Workability Factor:	35	37.3
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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: