

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-101**

Sample Date: 10/9/23

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 10/10/2023 through 10/16/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	50.0
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	75-051	Mid Michigan	1150	6.93	2.66	39.7
Total Wt			2900	17.63		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"	85.7	100.0	100.0	92.9	7.2	7.2
1/2"	44.3	95.8	100.0	71.7	21.1	28.3
3/8"	27.4	86.8	100.0	62.3	9.4	37.7
#4	3.4	22.5	96.2	42.2	20.2	57.8
#8	1.6	5.2	81.5	33.7	8.5	66.3
#16	1.4	2.4	67.4	27.7	6.0	72.3
#30	1.4	1.8	52.1	21.5	6.1	78.5
#50	1.3	1.6	25.6	11.0	10.6	89.0
#100	1.3	1.5	6.6	3.4	7.5	96.6
LBW	1.1	1.3	0.8	1.0	2.4	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 4% for the 3/4" sieve when

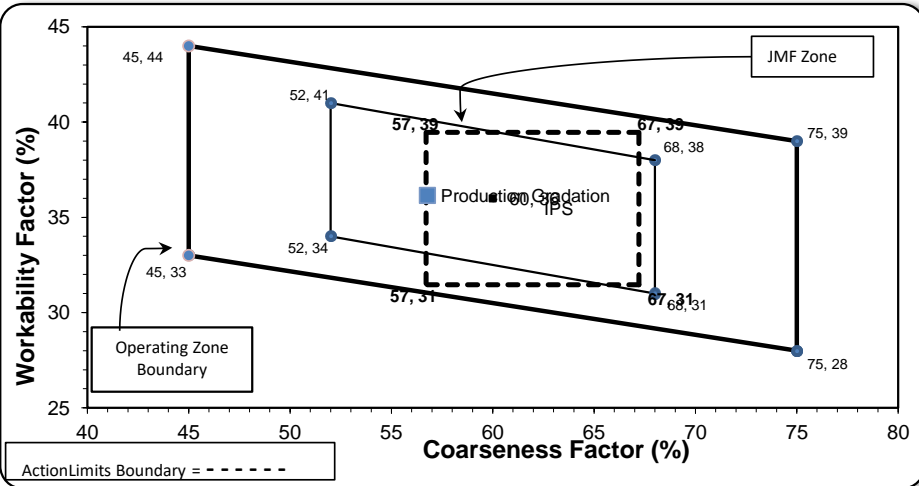
a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	57	Workability Factor:	34	Adjusted WF	36.2	Coarseness Factor:	62
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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"	95.0	5.0	5.0
1/2"	70.5	24.5	29.5
3/8"	60.0	10.5	40.0
#4	44.4	15.6	55.6
#8	35.5	9.0	64.5
#16	28.5	7.0	71.5
#30	21.5	7.0	78.5
#50	10.2	11.3	89.8
#100	3.1	7.1	96.9
LBW	1.3	1.8	98.7

PREPARED BY:
SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	80.4	100.0	100.0	90.7	9.3	9.3
1/2"	35.6	99.4	100.0	69.4	21.3	30.6
3/8"	12.1	87.6	100.0	56.6	12.8	43.4
#4	2.0	7.5	98.8	40.5	16.1	59.5
#8	1.5	2.5	85.6	34.4	6.1	65.6
#16	1.5	2.2	66.6	27.0	7.4	73.0
#30	1.4	2.0	45.5	18.7	8.3	81.3
#50	1.3	1.9	20.9	9.0	9.7	91.0
#100	1.2	1.8	3.4	2.1	6.9	97.9
LBW	0.9	1.7	0.5	0.9	1.3	99.1



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

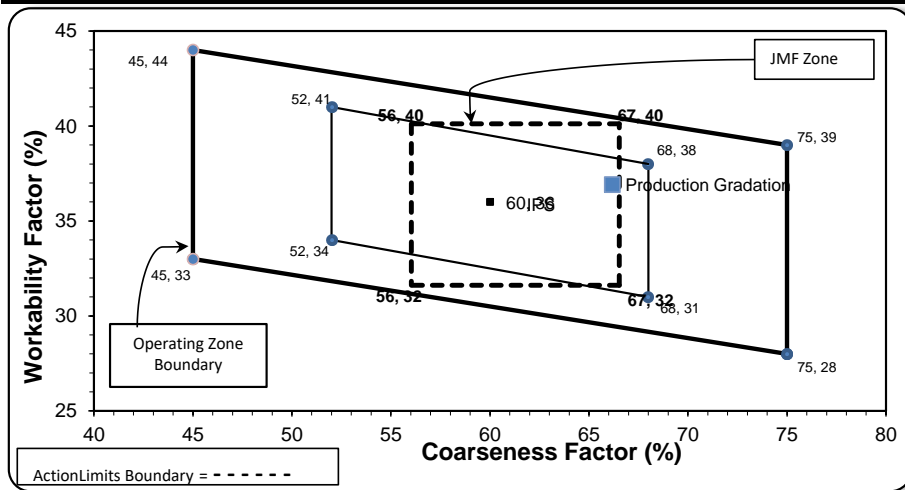
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") 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	36.9
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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: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	80.4	100.0	100.0	90.7	9.3	9.3
1/2"	35.6	99.4	100.0	69.4	21.3	30.6
3/8"	12.1	87.6	100.0	56.6	12.8	43.4
#4	2.0	7.5	98.8	40.5	16.1	59.5
#8	1.5	2.5	85.6	34.4	6.1	65.6
#16	1.5	2.2	66.6	27.0	7.4	73.0
#30	1.4	2.0	45.5	18.7	8.3	81.3
#50	1.3	1.9	20.9	9.0	9.7	91.0
#100	1.2	1.8	3.4	2.1	6.9	97.9
LBW	0.9	1.7	0.5	0.9	1.3	99.1



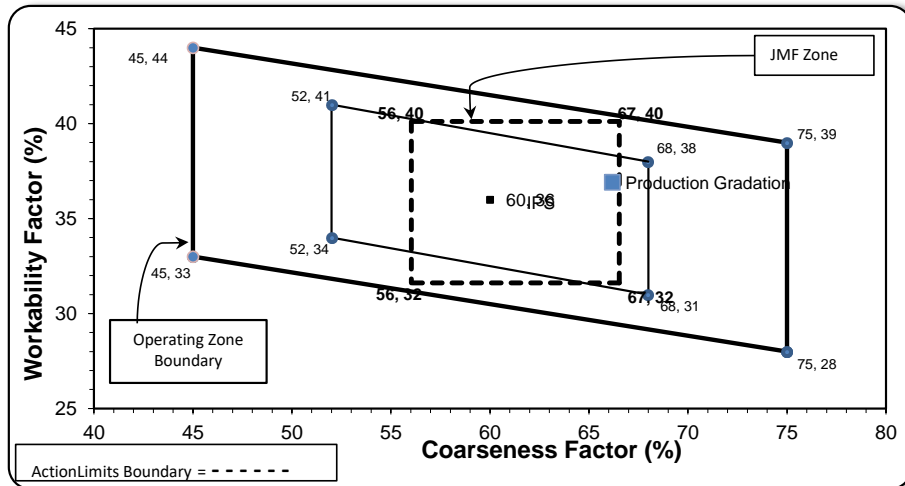
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	34	36.9
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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 #: 14

Sample Date: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.3
26A	58-003	Stoneco	460	2.74	2.69	15.5
2NS	19-04	Schlegel	1100	6.60	2.67	37.2
Total Wt			2960	17.68		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"	80.4	100.0	100.0	90.7	9.3	9.3
1/2"	35.6	99.4	100.0	69.4	21.3	30.6
3/8"	12.1	87.6	100.0	56.5	12.9	43.5
#4	2.0	7.5	100.0	39.3	17.2	60.7
#8	1.5	2.5	86.3	33.2	6.1	66.8
#16	1.5	2.2	68.6	26.5	6.6	73.5
#30	1.4	2.0	50.6	19.8	6.8	80.2
#50	1.3	1.9	15.7	6.7	13.0	93.3
#100	1.2	1.8	3.2	2.0	4.7	98.0
LBW	0.9	1.7	0.8	1.0	1.0	99.0



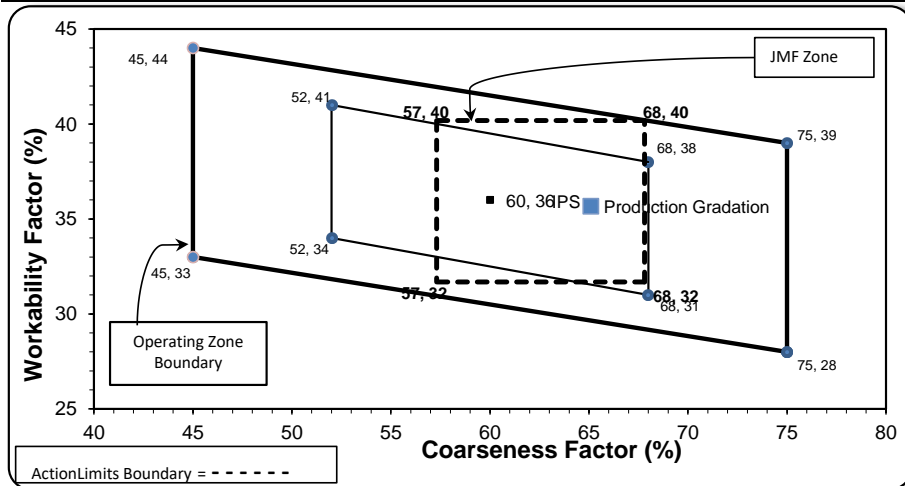
Builders Redi-Mix
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	65	Workability Factor:	33	35.7
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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



PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: 12

Sample Date: 10/9/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
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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 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"	96.1	100.0	100.0	98.1	1.9	1.9
3/4"	72.5	100.0	100.0	86.3	11.8	13.7
1/2"	30.7	93.0	100.0	64.7	21.6	35.3
3/8"	16.4	81.5	100.0	56.3	8.3	43.7
#4	3.1	19.2	96.4	41.7	14.6	58.3
#8	2.2	4.6	81.7	33.9	7.8	66.1
#16	1.9	2.4	66.4	27.5	6.4	72.5
#30	1.8	1.9	49.7	20.8	6.7	79.2
#50	1.8	1.8	24.5	10.8	10.0	89.2
#100	1.7	1.7	5.7	3.3	7.5	96.7
LBW	1.2	1.5	0.6	1.0	2.3	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

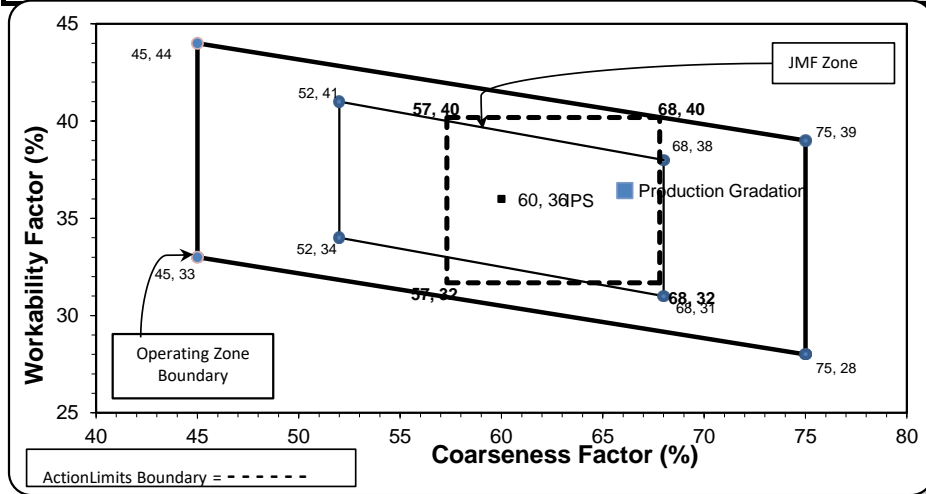
Adjusted WF Intial Production Sample (IPS)

Coarseness Factor: **66** Workability Factor: **34**

Adjusted WF: **36.4**

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

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: p11

Contractor: _____

Sample Date: 10/9/23

Concrete Grade: DM, 4500HP

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1355	8.29	2.62	46.6
26A	71-47	Presque Isle	400	2.45	2.62	13.8
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		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"	97.8	100.0	100.0	99.0	1.0	1.0
3/4"	73.9	100.0	100.0	87.8	11.1	12.2
1/2"	27.8	93.0	100.0	65.4	22.5	34.6
3/8"	13.7	81.5	100.0	57.2	8.2	42.8
#4	2.7	19.2	96.9	42.3	14.9	57.7
#8	2.1	4.6	86.2	35.7	6.5	64.3
#16	2.0	2.4	71.5	29.6	6.2	70.4
#30	1.9	1.9	52.6	22.0	7.6	78.0
#50	1.8	1.8	24.4	10.7	11.2	89.3
#100	1.7	1.7	7.0	3.8	6.9	96.2
LBW	1.3	1.5	1.3	1.3	2.5	98.7

*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 4% for the 3/4" sieve when

a 1.5" max. size (nom. Max. 1.0") aggregate is used.

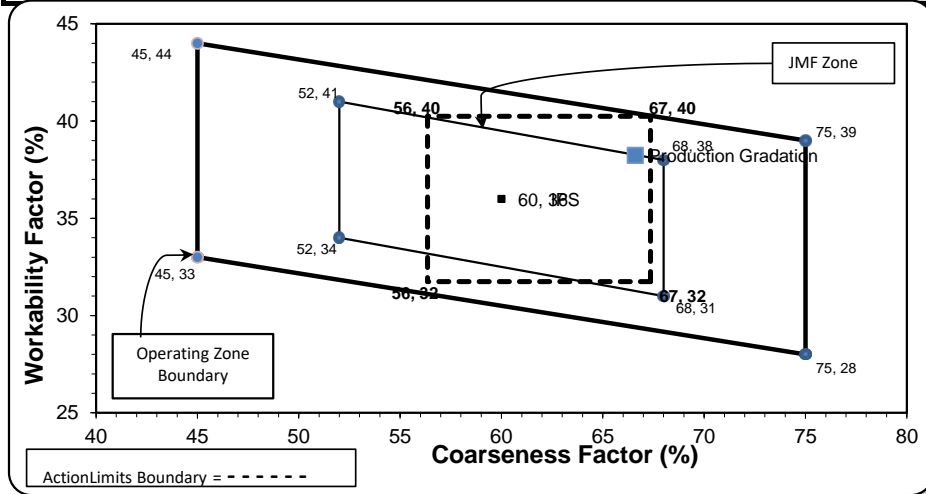
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

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

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: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1355	8.29	2.62	46.6
26A	71-47	Presque Isle	400	2.45	2.62	13.8
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		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"	97.8	100.0	100.0	99.0	1.0	1.0
3/4"	73.9	100.0	100.0	87.8	11.1	12.2
1/2"	27.8	93.0	100.0	65.4	22.5	34.6
3/8"	13.7	81.5	100.0	57.2	8.2	42.8
#4	2.7	19.2	96.9	42.3	14.9	57.7
#8	2.1	4.6	86.2	35.7	6.5	64.3
#16	2.0	2.4	71.5	29.6	6.2	70.4
#30	1.9	1.9	52.6	22.0	7.6	78.0
#50	1.8	1.8	24.4	10.7	11.2	89.3
#100	1.7	1.7	7.0	3.8	6.9	96.2
LBW	1.3	1.5	1.3	1.3	2.5	98.7

*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 4% for the 3/4" sieve when

a 1.5" max. size (nom. Max. 1.0") aggregate is used.

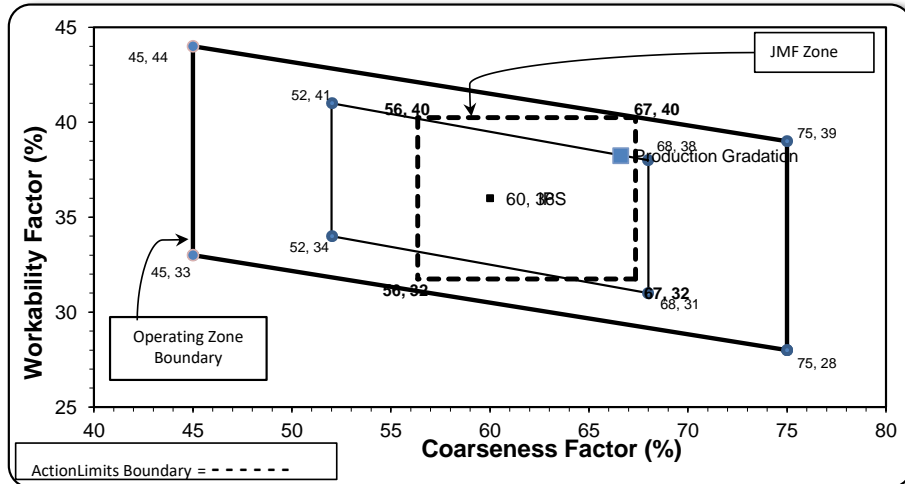
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	67	Workability Factor:	36	38.2
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Coarseness Factor:	62
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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"	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:
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Approved By:

Aggregate Optimization Chart

PLANT #: **P-35**

Sample Date: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	80.4	100.0	100.0	90.7	9.3	9.3
1/2"	35.6	99.4	100.0	69.4	21.3	30.6
3/8"	12.1	87.6	100.0	56.6	12.8	43.4
#4	2.0	7.5	98.8	40.5	16.1	59.5
#8	1.5	2.5	85.6	34.4	6.1	65.6
#16	1.5	2.2	66.6	27.0	7.4	73.0
#30	1.4	2.0	45.5	18.7	8.3	81.3
#50	1.3	1.9	20.9	9.0	9.7	91.0
#100	1.2	1.8	3.4	2.1	6.9	97.9
LBW	0.9	1.7	0.5	0.9	1.3	99.1



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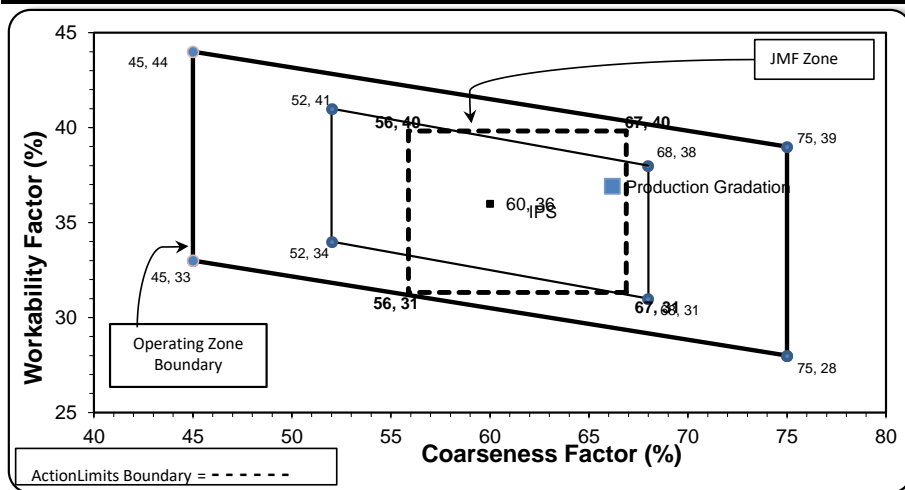
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 **% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 ***% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") 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	36.9
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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"	89.1	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:
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Approved By:

Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-92	Grange Hall	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"	96.1	100.0	100.0	98.1	1.9	1.9
3/4"	72.5	100.0	100.0	86.3	11.8	13.7
1/2"	30.7	93.0	100.0	64.7	21.6	35.3
3/8"	16.4	81.5	100.0	56.3	8.3	43.7
#4	3.1	19.2	97.6	42.2	14.1	57.8
#8	2.2	4.6	84.0	34.8	7.4	65.2
#16	1.9	2.4	69.4	28.7	6.2	71.3
#30	1.8	1.9	50.7	21.2	7.5	78.8
#50	1.8	1.8	20.4	9.2	12.0	90.8
#100	1.7	1.7	2.9	2.2	7.0	97.8
LBW	1.2	1.5	0.7	1.0	1.1	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 4% for the 3/4" sieve when

a 1.5" max. size (nom. Max. 1.0") aggregate is used.

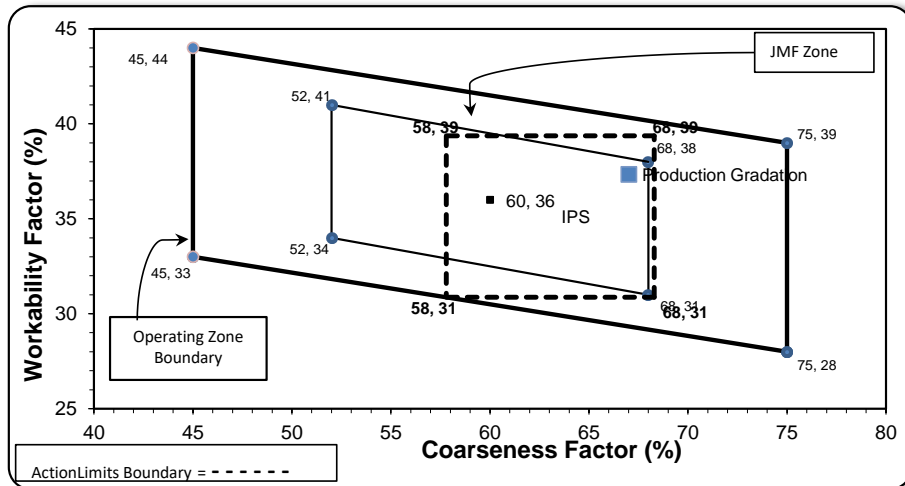
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	67	Workability Factor:	35	37.3
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Coarseness Factor:	63
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Workability Factor:	35
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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"	99.1	0.9	0.9
3/4"	90.3	8.8	9.7
1/2"	69.2	21.1	30.8
3/8"	59.1	10.1	40.9
#4	41.8	17.3	58.2
#8	35.1	6.6	64.9
#16	28.5	6.6	71.5
#30	21.2	7.3	78.8
#50	8.7	12.5	91.3
#100	1.8	7.0	98.2
LBW	0.7	1.0	99.3

PREPARED BY:
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Approved By:

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-38

Sample Date: 10/9/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		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"	80.4	100.0	100.0	90.7	9.3	9.3
1/2"	35.6	99.4	100.0	69.4	21.3	30.6
3/8"	12.1	87.6	100.0	56.6	12.8	43.4
#4	2.0	7.5	98.8	40.5	16.1	59.5
#8	1.5	2.5	85.6	34.4	6.1	65.6
#16	1.5	2.2	66.6	27.0	7.4	73.0
#30	1.4	2.0	45.5	18.7	8.3	81.3
#50	1.3	1.9	20.9	9.0	9.7	91.0
#100	1.2	1.8	3.4	2.1	6.9	97.9
LBW	0.9	1.7	0.5	0.9	1.3	99.1



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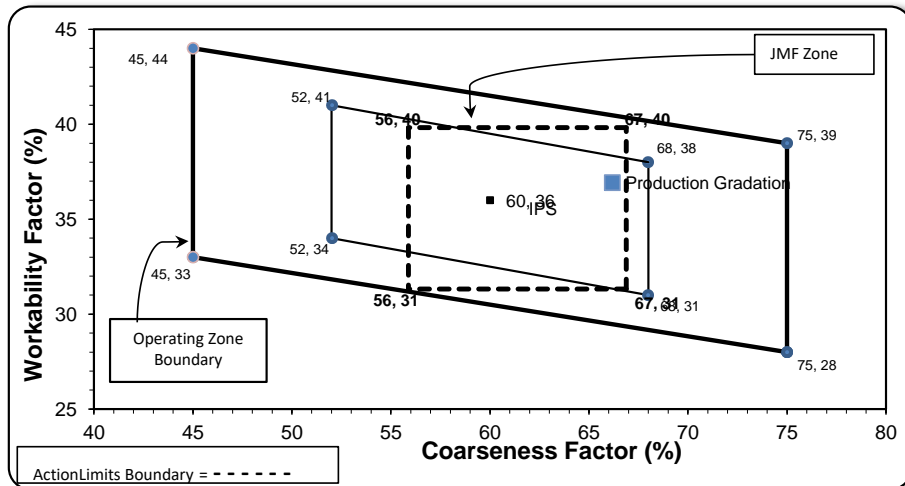
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 **% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 ***% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") 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	36.9
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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"	89.1	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

PLANT #: **P-39**

Sample Date: 10/9/23

Concrete Grade: **DM, 450HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1505	9.21	2.62	51.8
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	44-051	Krake Willis Rd	1100	6.65	2.65	37.9
Total Wt			2905	17.69		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"	85.7	100.0	100.0	92.6	7.4	7.4
1/2"	44.3	95.8	100.0	70.7	21.9	29.3
3/8"	27.4	86.8	100.0	61.0	9.7	39.0
#4	3.4	22.5	98.9	41.5	19.5	58.5
#8	1.6	5.2	84.6	33.4	8.1	66.6
#16	1.4	2.4	68.9	27.1	6.3	72.9
#30	1.4	1.8	49.7	19.7	7.3	80.3
#50	1.3	1.6	23.8	9.9	9.9	90.1
#100	1.3	1.5	6.5	3.3	6.6	96.7
LBW	1.1	1.3	1.6	1.3	2.0	98.7



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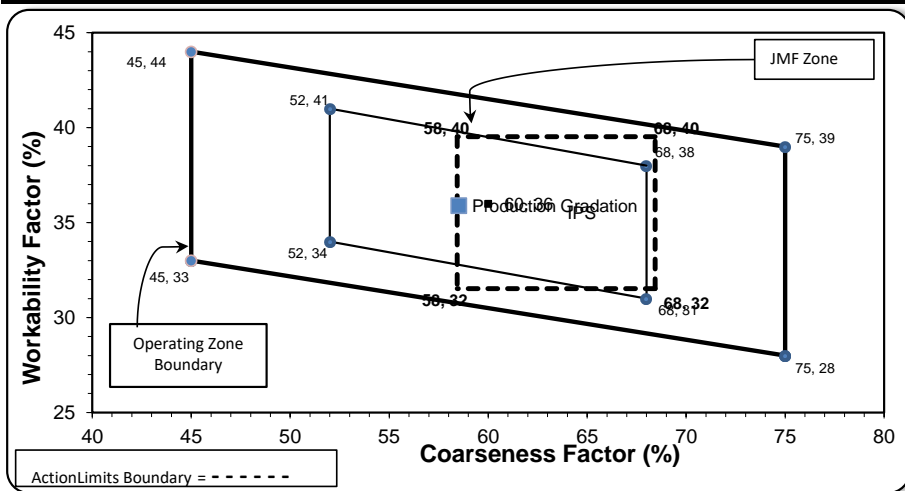
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 **% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 ***% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	59	Workability Factor:	33	Adjusted WF	35.9
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Coarseness Factor:	63
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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"	100.0	0.0	0.0
3/4"	89.7	10.3	10.3
1/2"	70.3	19.4	29.7
3/8"	59.1	11.2	40.9
#4	42.8	16.3	57.2
#8	35.5	7.3	64.5
#16	29.0	6.5	71.0
#30	21.2	7.7	78.8
#50	9.8	11.5	90.2
#100	3.7	6.1	96.3
LBW	1.2	2.5	98.8

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-O2**

Sample Date: 10/9/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 10/10/2023 through 10/16/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		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"	96.1	100.0	100.0	98.1	1.9	1.9
3/4"	72.5	100.0	100.0	86.3	11.8	13.7
1/2"	30.7	93.0	100.0	64.7	21.6	35.3
3/8"	16.4	81.5	100.0	56.3	8.3	43.7
#4	3.1	19.2	96.4	41.7	14.6	58.3
#8	2.2	4.6	81.7	33.9	7.8	66.1
#16	1.9	2.4	66.4	27.5	6.4	72.5
#30	1.8	1.9	49.7	20.8	6.7	79.2
#50	1.8	1.8	24.5	10.8	10.0	89.2
#100	1.7	1.7	5.7	3.3	7.5	96.7
LBW	1.2	1.5	0.6	1.0	2.3	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

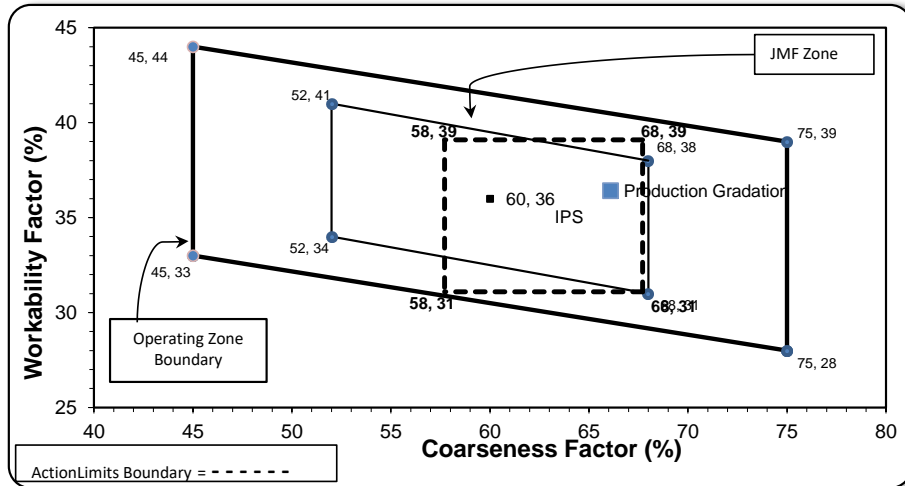
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	34	36.4
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Coarseness Factor:	63
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Workability Factor:	35
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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"	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: