

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-101**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.7
26A	71-47	Presque Isle	250	1.53	2.62	8.6
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"	96.8	100.0	100.0	98.3	1.7	1.7
3/4"	80.0	100.0	100.0	89.7	8.7	10.3
1/2"	40.3	96.3	100.0	68.8	20.9	31.2
3/8"	24.8	85.2	100.0	59.8	9.0	40.2
#4	4.5	22.1	95.9	42.3	17.6	57.7
#8	2.3	5.2	81.1	33.8	8.5	66.2
#16	2.0	2.5	67.1	27.9	5.9	72.1
#30	1.9	2.0	53.1	22.2	5.6	77.8
#50	1.8	1.8	26.7	11.7	10.5	88.3
#100	1.8	1.7	6.2	3.5	8.1	96.5
LBW	1.5	1.5	1.0	1.3	2.2	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.

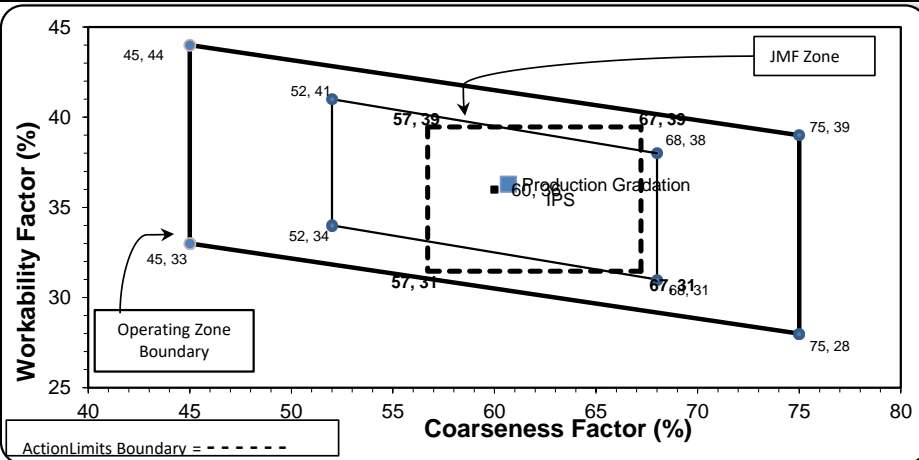
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	61	Workability Factor:	34	Adjusted WF	36.3
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Coarseness Factor:	62
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: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1525	9.09	2.69	51.7
26A	58-003	Stoneco	275	1.64	2.69	9.3
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"	86.8	100.0	100.0	93.2	6.8	6.8
1/2"	43.5	99.6	100.0	70.8	22.4	29.2
3/8"	22.3	89.7	100.0	58.9	11.9	41.1
#4	4.9	23.6	97.9	42.9	16.0	57.1
#8	2.9	5.8	83.0	34.4	8.5	65.6
#16	2.5	3.4	66.4	27.5	6.9	72.5
#30	2.3	2.8	47.2	19.9	7.6	80.2
#50	2.2	2.6	23.2	10.4	9.4	89.6
#100	2.0	2.4	4.4	3.0	7.5	97.0
LBW	1.6	2.1	0.4	1.2	1.8	98.8

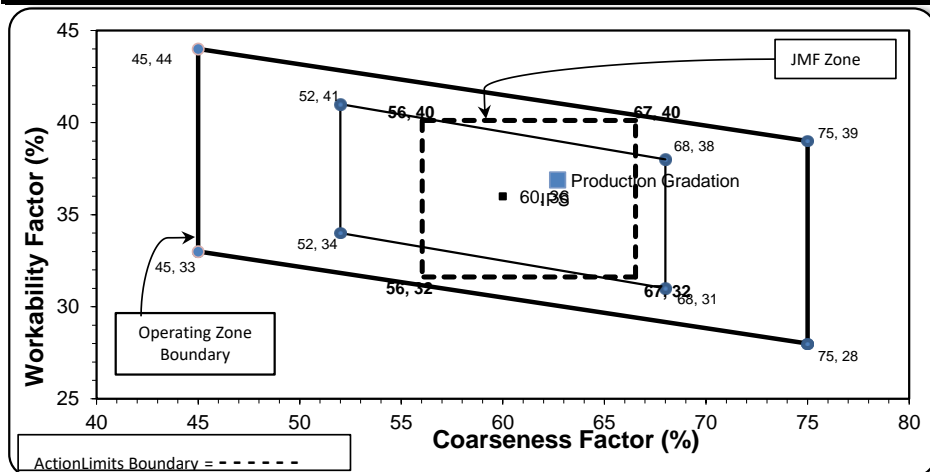
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	34	Adjusted WF	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 #: **P-103**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1525	9.09	2.69	51.7
26A	58-003	Stoneco	275	1.64	2.69	9.3
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"	86.8	100.0	100.0	93.2	6.8	6.8
1/2"	43.5	99.6	100.0	70.8	22.4	29.2
3/8"	22.3	89.7	100.0	58.9	11.9	41.1
#4	4.9	23.6	97.9	42.9	16.0	57.1
#8	2.9	5.8	83.0	34.4	8.5	65.6
#16	2.5	3.4	66.4	27.5	6.9	72.5
#30	2.3	2.8	47.2	19.9	7.6	80.2
#50	2.2	2.6	23.2	10.4	9.4	89.6
#100	2.0	2.4	4.4	3.0	7.5	97.0
LBW	1.6	2.1	0.4	1.2	1.8	98.8

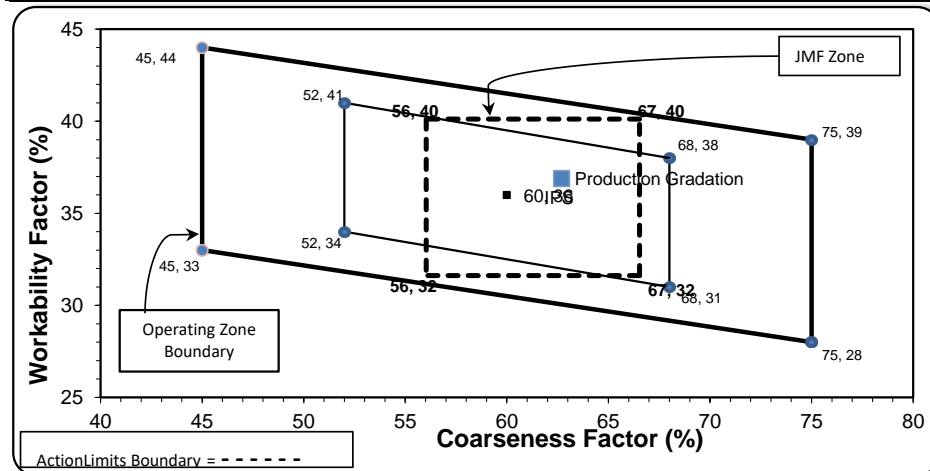
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	34	Adjusted WF	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: 9/4/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.7
26A	58-003	Stoneco	360	2.14	2.69	12.2
2NS	19-04	Schlegel	1100	6.60	2.67	37.2
Total Wt			2960	17.68		100.0

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



Builders Redi-Mix
 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"	86.8	100.0	100.0	93.3	6.7	6.7
1/2"	43.5	99.6	100.0	71.3	22.0	28.7
3/8"	22.3	89.7	100.0	59.4	11.9	40.6
#4	4.9	23.6	99.9	42.5	16.9	57.5
#8	2.9	5.8	90.1	35.7	6.8	64.3
#16	2.5	3.4	69.4	27.5	8.2	72.5
#30	2.3	2.8	44.5	18.0	9.4	82.0
#50	2.2	2.6	14.3	6.7	11.3	93.3
#100	2.0	2.4	2.7	2.3	4.4	97.7
LBW	1.6	2.1	0.2	1.1	1.2	98.9

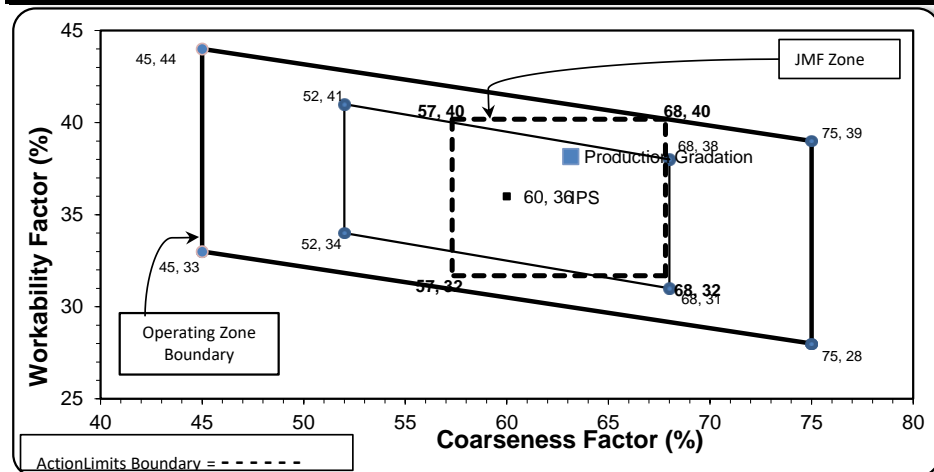
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	36	Adjusted WF	38.2
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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: 9/4/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

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%



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"	96.6	100.0	100.0	98.3	1.7	1.7
3/4"	75.0	100.0	100.0	87.5	10.8	12.5
1/2"	30.8	96.5	100.0	65.1	22.4	34.9
3/8"	14.8	87.2	100.0	56.1	9.0	43.9
#4	3.8	25.7	96.5	42.8	13.3	57.2
#8	2.2	6.3	82.8	34.5	8.3	65.5
#16	1.8	2.8	68.0	28.1	6.4	71.9
#30	1.6	2.1	50.8	21.1	7.0	78.9
#50	1.6	1.9	25.7	11.2	10.0	88.8
#100	1.4	1.8	5.3	3.0	8.2	97.0
LBW	1.2	1.6	0.6	1.0	2.0	99.0

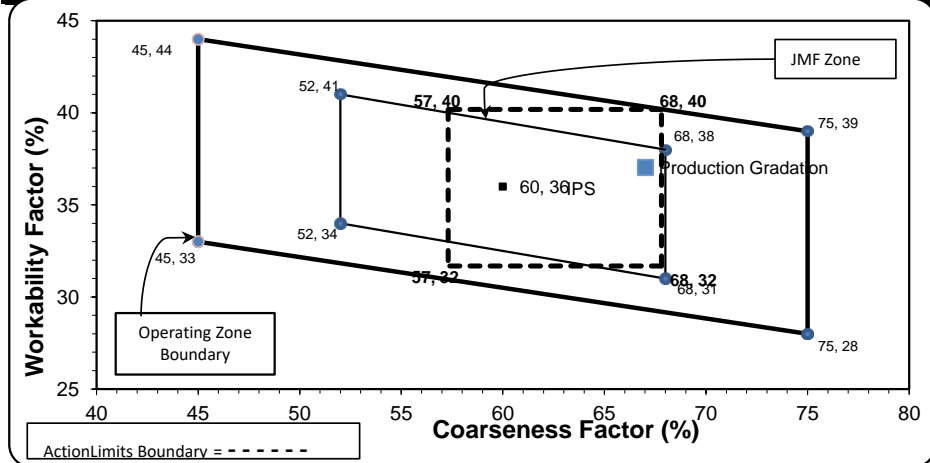
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (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** Adjusted WF: **37.0**

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

Sample Date: 9/4/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
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"	97.0	100.0	100.0	98.5	1.5	1.5
3/4"	85.9	100.0	100.0	92.9	5.6	7.1
1/2"	46.5	96.5	100.0	72.8	20.1	27.2
3/8"	29.3	87.2	100.0	63.3	9.6	36.7
#4	6.8	25.7	96.9	44.4	18.8	55.6
#8	3.5	6.3	86.2	36.5	7.9	63.5
#16	3.0	2.8	71.4	30.1	6.5	69.9
#30	2.7	2.1	51.2	21.8	8.2	78.2
#50	2.6	1.9	24.3	11.1	10.7	88.9
#100	2.4	1.8	7.5	4.4	6.8	95.6
LBW	1.8	1.6	1.5	1.7	2.7	98.3

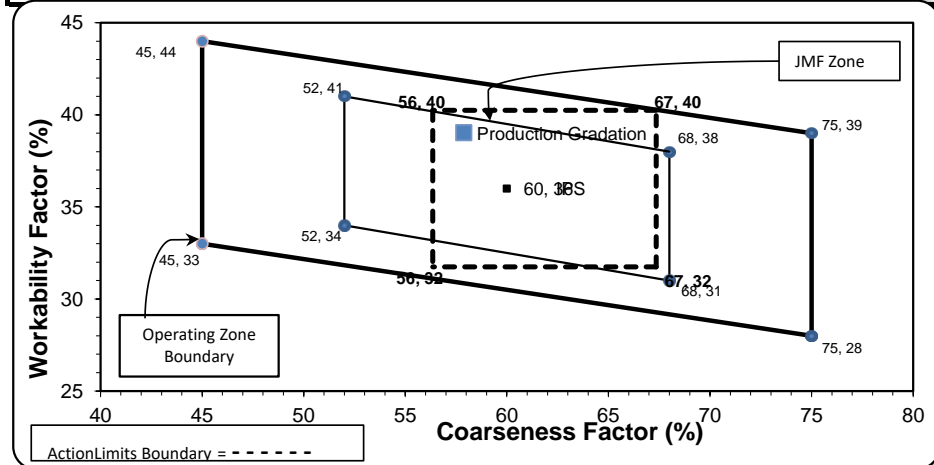
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	58	Workability Factor:	37	Adjusted WF	39.0
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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

PLANT #: **P-32**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
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"	97.0	100.0	100.0	98.5	1.5	1.5
3/4"	85.9	100.0	100.0	92.9	5.6	7.1
1/2"	46.5	96.5	100.0	72.8	20.1	27.2
3/8"	29.3	87.2	100.0	63.3	9.6	36.7
#4	6.8	25.7	96.9	44.4	18.8	55.6
#8	3.5	6.3	86.2	36.5	7.9	63.5
#16	3.0	2.8	71.4	30.1	6.5	69.9
#30	2.7	2.1	51.2	21.8	8.2	78.2
#50	2.6	1.9	24.3	11.1	10.7	88.9
#100	2.4	1.8	7.5	4.4	6.8	95.6
LBW	1.8	1.6	1.5	1.7	2.7	98.3

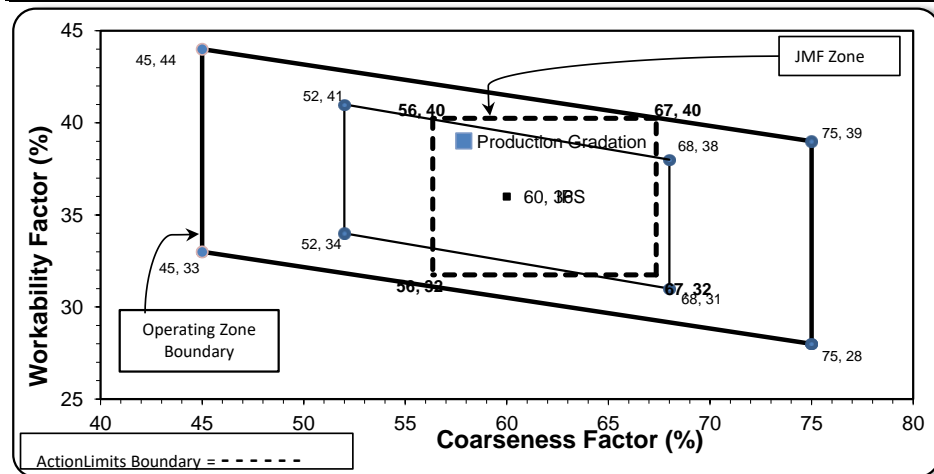
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	58	Workability Factor:	37	Adjusted WF	39.0
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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

PLANT #: **P-35**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1525	9.09	2.69	51.7
26A	58-003	Stoneco	275	1.64	2.69	9.3
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"	86.8	100.0	100.0	93.2	6.8	6.8
1/2"	43.5	99.6	100.0	70.8	22.4	29.2
3/8"	22.3	89.7	100.0	58.9	11.9	41.1
#4	4.9	23.6	97.9	42.9	16.0	57.1
#8	2.9	5.8	83.0	34.4	8.5	65.6
#16	2.5	3.4	66.4	27.5	6.9	72.5
#30	2.3	2.8	47.2	19.9	7.6	80.2
#50	2.2	2.6	23.2	10.4	9.4	89.6
#100	2.0	2.4	4.4	3.0	7.5	97.0
LBW	1.6	2.1	0.4	1.2	1.8	98.8

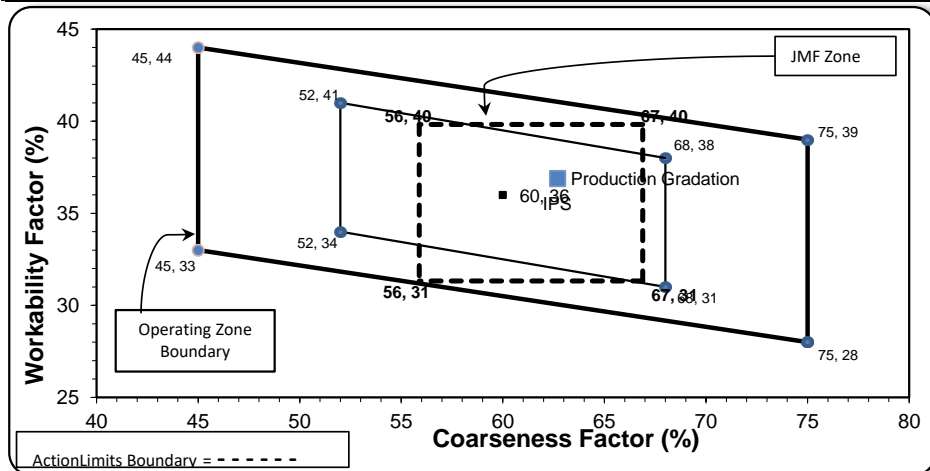
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	63	Workability Factor:	34	Adjusted WF	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"	89.1	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

PLANT #: **P-36**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

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"	96.6	100.0	100.0	98.3	1.7	1.7
3/4"	75.0	100.0	100.0	87.5	10.8	12.5
1/2"	30.8	96.5	100.0	65.1	22.4	34.9
3/8"	14.8	87.2	100.0	56.1	9.0	43.9
#4	3.8	25.7	97.1	43.0	13.1	57.0
#8	2.2	6.3	83.3	34.7	8.3	65.3
#16	1.8	2.8	69.2	28.6	6.1	71.4
#30	1.6	2.1	50.3	20.9	7.7	79.1
#50	1.6	1.9	20.0	8.9	12.0	91.1
#100	1.4	1.8	2.8	2.0	6.9	98.0
LBW	1.2	1.6	0.3	0.9	1.1	99.1

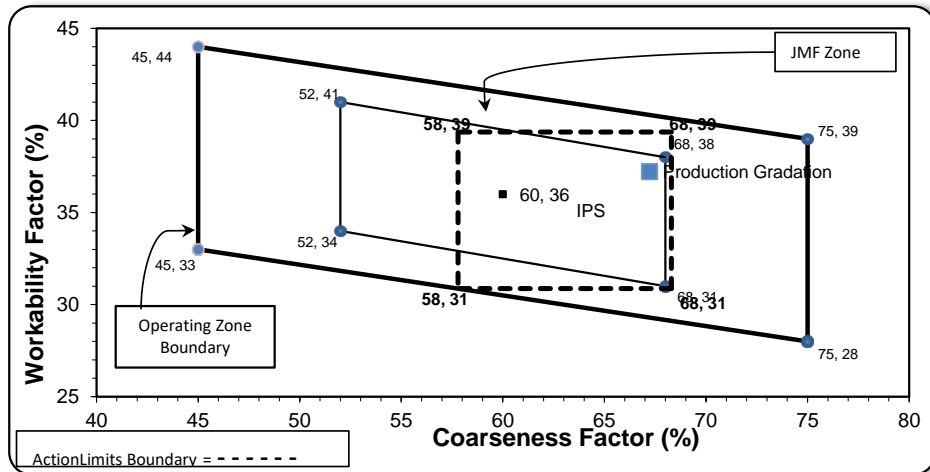
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (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	37.2
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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"	99.1	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:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-38**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1525	9.09	2.69	51.7
26A	58-003	Stoneco	275	1.64	2.69	9.3
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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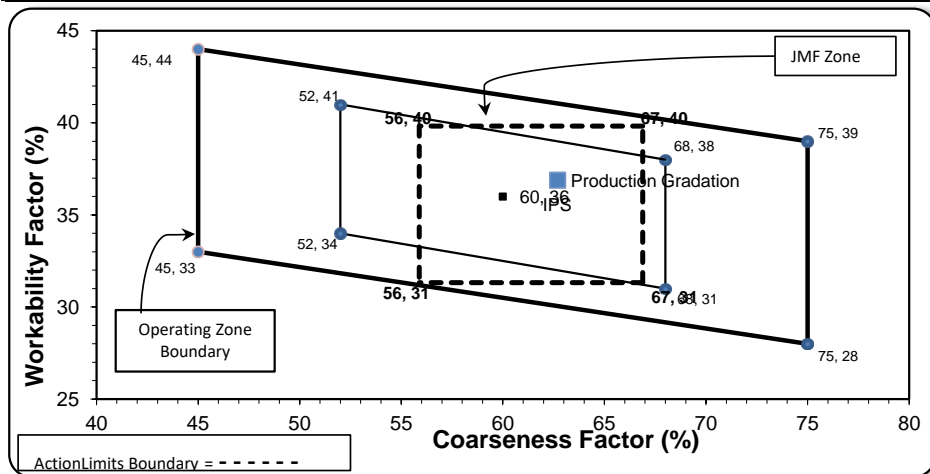
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	86.8	100.0	100.0	93.2	6.8	6.8
1/2"	43.5	99.6	100.0	70.8	22.4	29.2
3/8"	22.3	89.7	100.0	58.9	11.9	41.1
#4	4.9	23.6	97.9	42.9	16.0	57.1
#8	2.9	5.8	83.0	34.4	8.5	65.6
#16	2.5	3.4	66.4	27.5	6.9	72.5
#30	2.3	2.8	47.2	19.9	7.6	80.2
#50	2.2	2.6	23.2	10.4	9.4	89.6
#100	2.0	2.4	4.4	3.0	7.5	97.0
LBW	1.6	2.1	0.4	1.2	1.8	98.8

*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:	63	Workability Factor:	34	Adjusted WF	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"	89.1	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

PLANT #: **P-39**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 9/5/2023 through 9/11/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1605	9.82	2.62	55.2
26A	71-47	Presque Isle	200	1.22	2.62	6.9
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%



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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	98.2	1.8	1.8
3/4"	80.0	100.0	100.0	89.0	9.3	11.0
1/2"	40.3	96.3	100.0	66.8	22.2	33.2
3/8"	24.8	85.2	100.0	57.4	9.3	42.6
#4	4.5	22.1	99.0	41.5	15.9	58.5
#8	2.3	5.2	85.0	33.8	7.7	66.2
#16	2.0	2.5	67.9	27.0	6.8	73.0
#30	1.9	2.0	50.6	20.3	6.6	79.7
#50	1.8	1.8	23.1	9.9	10.5	90.1
#100	1.8	1.7	5.8	3.3	6.6	96.7
LBW	1.5	1.5	1.0	1.3	2.0	98.7

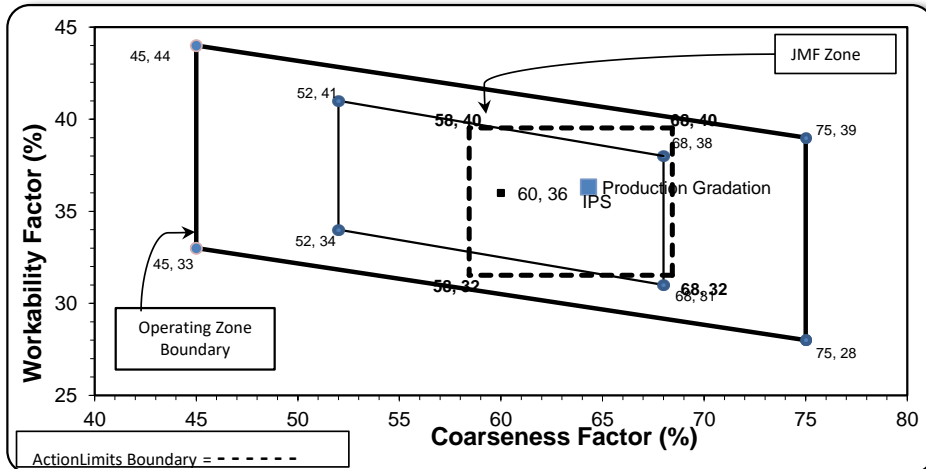
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	34	Adjusted WF	36.3
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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"	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-02**

Sample Date: 9/4/23

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 9/5/2023 through 9/11/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	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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 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"	96.6	100.0	100.0	98.3	1.7	1.7
3/4"	75.0	100.0	100.0	87.5	10.8	12.5
1/2"	30.8	96.5	100.0	65.1	22.4	34.9
3/8"	14.8	87.2	100.0	56.1	9.0	43.9
#4	3.8	25.7	96.5	42.8	13.3	57.2
#8	2.2	6.3	82.8	34.5	8.3	65.5
#16	1.8	2.8	68.0	28.1	6.4	71.9
#30	1.6	2.1	50.8	21.1	7.0	78.9
#50	1.6	1.9	25.7	11.2	10.0	88.8
#100	1.4	1.8	5.3	3.0	8.2	97.0
LBW	1.2	1.6	0.6	1.0	2.0	99.0

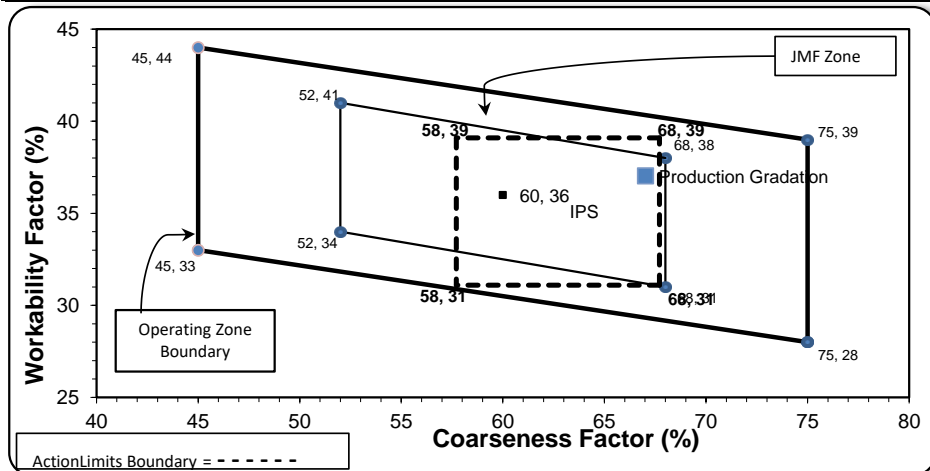
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (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	Adjusted WF	37.0
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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: