

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-101**

Sample Date: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

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"	98.4	100.0	100.0	99.2	0.8	0.8
3/4"	81.6	100.0	100.0	90.5	8.7	9.5
1/2"	41.4	95.8	100.0	69.3	21.2	30.7
3/8"	24.8	86.4	100.0	59.9	9.4	40.1
#4	4.8	21.7	96.1	42.5	17.5	57.5
#8	2.2	6.0	80.8	33.7	8.8	66.3
#16	2.0	3.2	66.7	27.8	5.9	72.2
#30	1.8	2.6	52.1	21.8	5.9	78.2
#50	1.8	2.3	28.7	12.5	9.3	87.5
#100	1.7	2.2	7.7	4.1	8.4	95.9
LBW	1.4	2.0	1.4	1.5	2.7	98.5

*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.

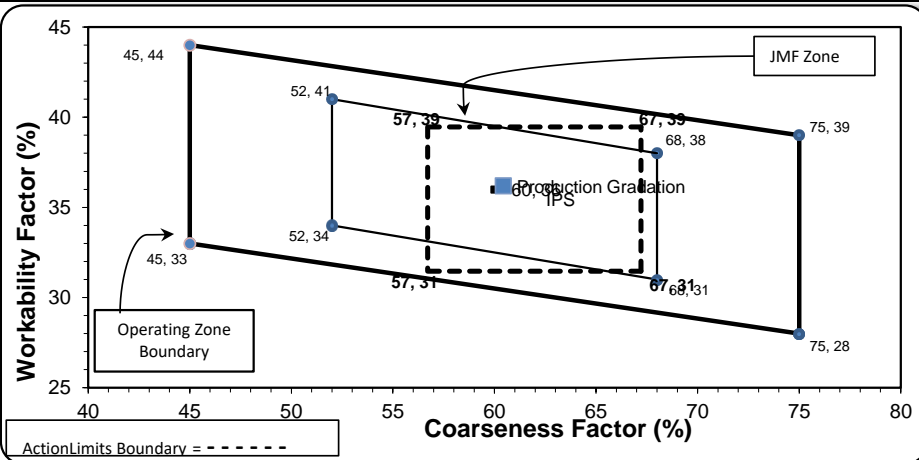
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	60	Workability Factor:	34	Adjusted WF	36.2
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
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
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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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	72.6	100.0	100.0	85.6	14.4	14.4
1/2"	38.3	97.7	100.0	67.4	18.2	32.6
3/8"	22.2	84.1	100.0	57.8	9.6	42.2
#4	3.2	10.3	98.3	40.9	16.9	59.1
#8	1.6	3.3	83.2	33.6	7.3	66.4
#16	1.4	2.5	65.4	26.4	7.1	73.6
#30	1.3	2.2	45.9	18.8	7.7	81.2
#50	1.2	2.0	22.2	9.5	9.3	90.5
#100	1.2	1.9	6.0	3.1	6.3	96.9
LBW	0.9	1.7	1.1	1.0	2.1	99.0

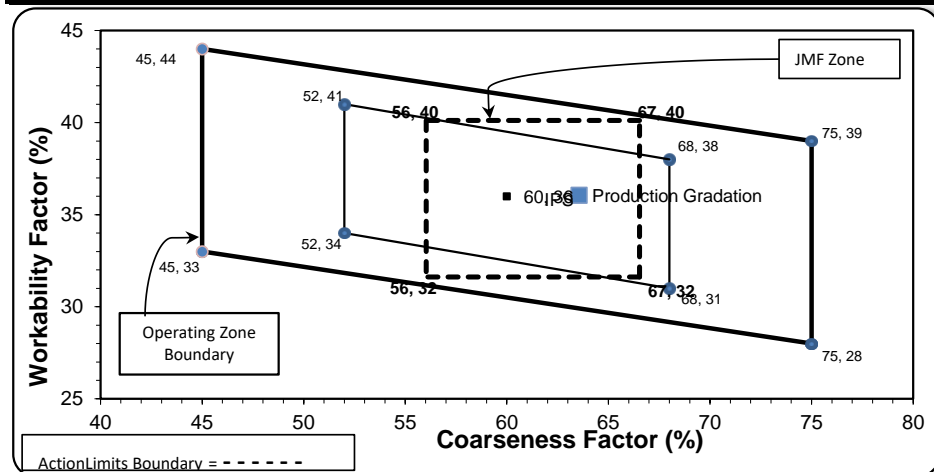
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	34	36.1
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
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"	72.6	100.0	100.0	85.6	14.4	14.4
1/2"	38.3	97.7	100.0	67.4	18.2	32.6
3/8"	22.2	84.1	100.0	57.8	9.6	42.2
#4	3.2	10.3	98.3	40.9	16.9	59.1
#8	1.6	3.3	83.2	33.6	7.3	66.4
#16	1.4	2.5	65.4	26.4	7.1	73.6
#30	1.3	2.2	45.9	18.8	7.7	81.2
#50	1.2	2.0	22.2	9.5	9.3	90.5
#100	1.2	1.9	6.0	3.1	6.3	96.9
LBW	0.9	1.7	1.1	1.0	2.1	99.0

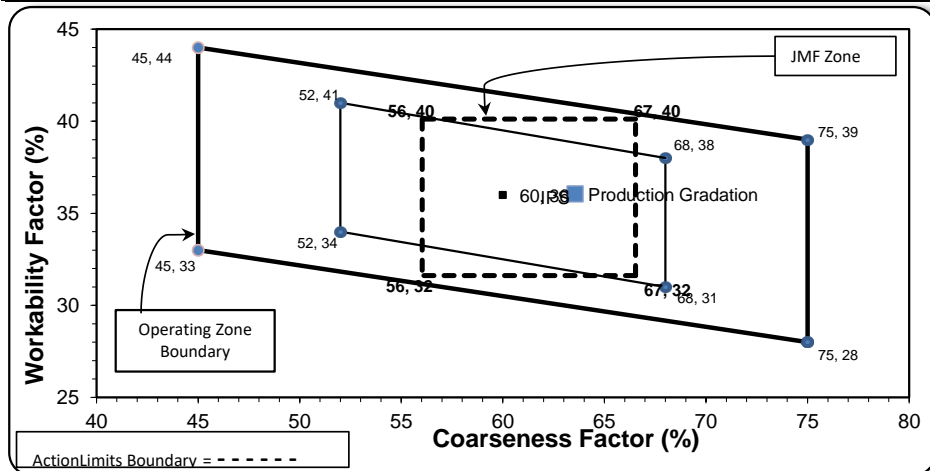
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	34	36.1
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1560	9.29	2.69	52.7
26A	58-003	Stoneco	300	1.79	2.69	10.1
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"	72.6	100.0	100.0	85.6	14.4	14.4
1/2"	38.3	97.7	100.0	67.2	18.3	32.8
3/8"	22.2	84.1	100.0	57.4	9.9	42.6
#4	3.2	10.3	99.9	39.9	17.5	60.1
#8	1.6	3.3	90.1	34.7	5.2	65.3
#16	1.4	2.5	69.4	26.8	7.9	73.2
#30	1.3	2.2	44.5	17.4	9.3	82.6
#50	1.2	2.0	14.3	6.1	11.3	93.9
#100	1.2	1.9	2.7	1.8	4.3	98.2
LBW	0.9	1.7	0.2	0.7	1.1	99.3

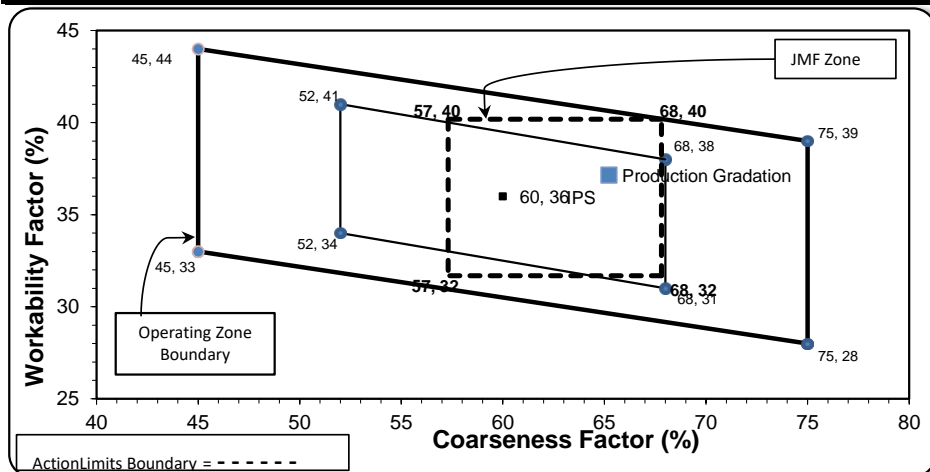
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	65	Workability Factor:	35	37.2	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"	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: 7/10/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	53.4
26A	71-47	Presque Isle	205	1.25	2.62	7.1
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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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

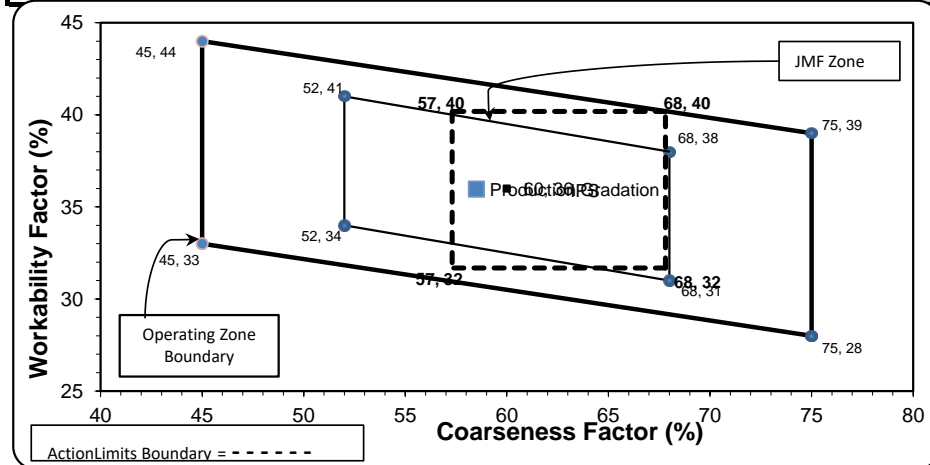
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.7	100.0	100.0	99.3	0.7	0.7
3/4"	81.5	100.0	100.0	90.1	9.2	9.9
1/2"	43.7	97.0	100.0	69.7	20.4	30.3
3/8"	28.3	90.6	100.0	61.1	8.7	38.9
#4	5.5	19.9	96.2	42.4	18.7	57.6
#8	2.5	4.4	80.4	33.5	8.9	66.5
#16	2.1	2.2	65.5	27.2	6.3	72.8
#30	2.0	1.7	49.9	20.9	6.3	79.1
#50	1.9	1.6	26.4	11.6	9.4	88.4
#100	1.8	1.5	6.9	3.8	7.8	96.2
LBW	1.4	1.3	1.2	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 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:	59	Workability Factor:	33	36.0	Coarseness Factor:	63
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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 #: 20

Sample Date: 7/10/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

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	63-92	Grange Hall	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"	96.0	100.0	100.0	97.9	2.1	2.1
3/4"	73.9	100.0	100.0	86.5	11.4	13.5
1/2"	30.9	95.6	100.0	63.7	22.7	36.3
3/8"	17.3	83.6	100.0	55.5	8.3	44.5
#4	3.5	18.1	97.5	40.6	14.9	59.4
#8	2.2	5.0	84.2	33.5	7.1	66.5
#16	2.0	2.6	71.2	28.3	5.3	71.7
#30	1.9	2.1	52.6	21.1	7.1	78.9
#50	1.8	1.9	23.3	10.0	11.2	90.0
#100	1.7	1.8	4.4	2.7	7.2	97.3
LBW	1.4	1.6	0.6	1.1	1.6	98.9



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

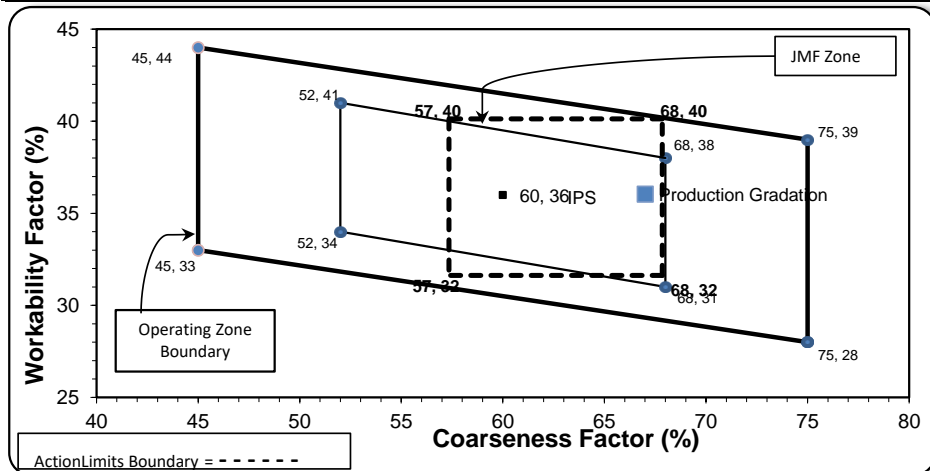
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	67	Workability Factor:	34	36.0	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"	89.2	10.8	10.8
1/2"	68.4	20.8	31.6
3/8"	59.9	8.6	40.1
#4	43.0	16.9	57.0
#8	35.9	7.1	64.1
#16	29.0	6.8	71.0
#30	21.3	7.7	78.7
#50	9.9	11.4	90.1
#100	2.4	7.5	97.6
LBW	1.2	1.2	98.8

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: p11

Sample Date: 7/10/23

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6
26A	71-47	Presque Isle	255	1.56	2.62	8.8
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"	96.8	100.0	100.0	98.3	1.7	1.7
3/4"	79.8	100.0	100.0	89.6	8.8	10.4
1/2"	39.2	97.0	100.0	68.3	21.2	31.7
3/8"	21.7	90.6	100.0	58.7	9.6	41.3
#4	4.5	19.9	96.7	42.4	16.4	57.6
#8	2.9	4.4	85.1	35.6	6.8	64.4
#16	2.6	2.2	70.2	29.3	6.2	70.7
#30	2.5	1.7	50.6	21.5	7.9	78.5
#50	2.4	1.6	25.0	11.3	10.2	88.7
#100	2.3	1.5	7.6	4.3	6.9	95.7
LBW	2.0	1.3	1.3	1.7	2.7	98.3

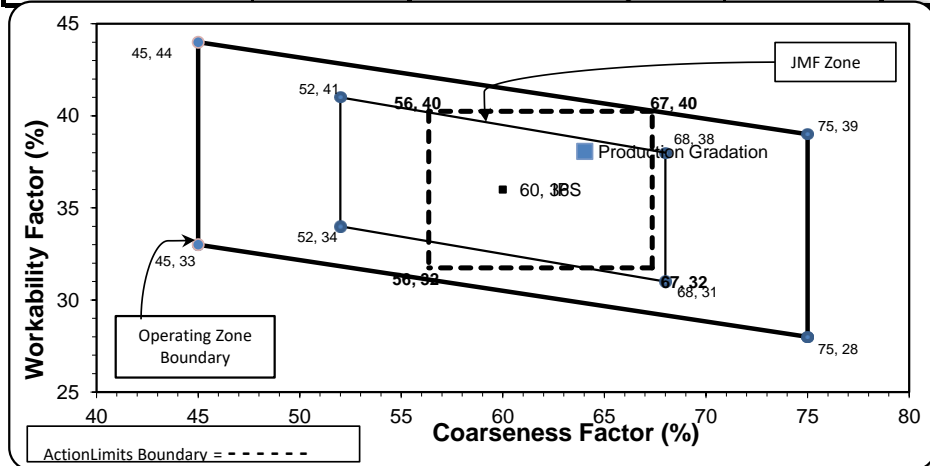
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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:	36	Adjusted WF	38.1
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6
26A	71-47	Presque Isle	255	1.56	2.62	8.8
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

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



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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	98.3	1.7	1.7
3/4"	79.8	100.0	100.0	89.6	8.8	10.4
1/2"	39.2	97.0	100.0	68.3	21.2	31.7
3/8"	21.7	90.6	100.0	58.7	9.6	41.3
#4	4.5	19.9	96.7	42.4	16.4	57.6
#8	2.9	4.4	85.1	35.6	6.8	64.4
#16	2.6	2.2	70.2	29.3	6.2	70.7
#30	2.5	1.7	50.6	21.5	7.9	78.5
#50	2.4	1.6	25.0	11.3	10.2	88.7
#100	2.3	1.5	7.6	4.3	6.9	95.7
LBW	2.0	1.3	1.3	1.7	2.7	98.3

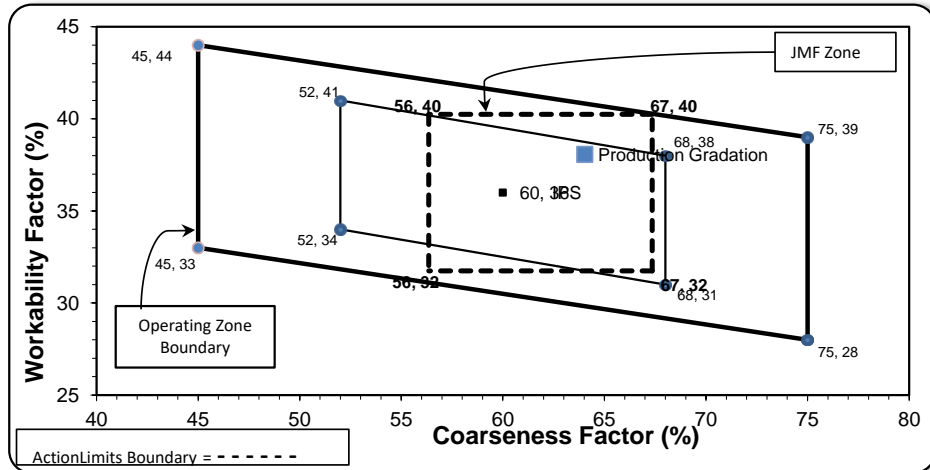
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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:	36	38.1	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:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-35**

Sample Date: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
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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 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"	72.6	100.0	100.0	85.6	14.4	14.4
1/2"	38.3	97.7	100.0	67.4	18.2	32.6
3/8"	22.2	84.1	100.0	57.8	9.6	42.2
#4	3.2	10.3	98.3	40.9	16.9	59.1
#8	1.6	3.3	83.2	33.6	7.3	66.4
#16	1.4	2.5	65.4	26.4	7.1	73.6
#30	1.3	2.2	45.9	18.8	7.7	81.2
#50	1.2	2.0	22.2	9.5	9.3	90.5
#100	1.2	1.9	6.0	3.1	6.3	96.9
LBW	0.9	1.7	1.1	1.0	2.1	99.0

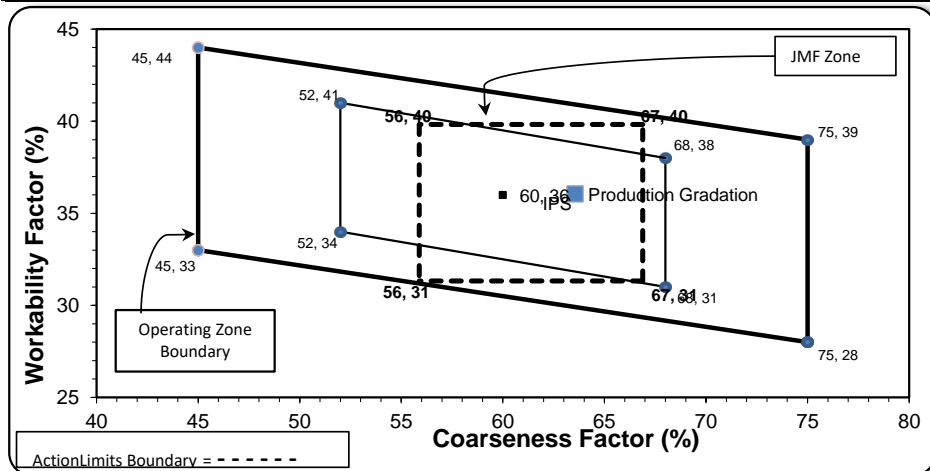
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	34	36.1
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	53.4
26A	71-47	Presque Isle	205	1.25	2.62	7.1
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"	98.7	100.0	100.0	99.3	0.7	0.7
3/4"	81.5	100.0	100.0	90.1	9.2	9.9
1/2"	43.7	97.0	100.0	69.7	20.4	30.3
3/8"	28.3	90.6	100.0	61.1	8.7	38.9
#4	5.5	19.9	97.5	42.9	18.1	57.1
#8	2.5	4.4	84.2	35.0	8.0	65.0
#16	2.1	2.2	71.2	29.5	5.5	70.5
#30	2.0	1.7	52.6	22.0	7.5	78.0
#50	1.9	1.6	23.3	10.4	11.7	89.6
#100	1.8	1.5	4.4	2.8	7.5	97.2
LBW	1.4	1.3	0.6	1.1	1.7	98.9

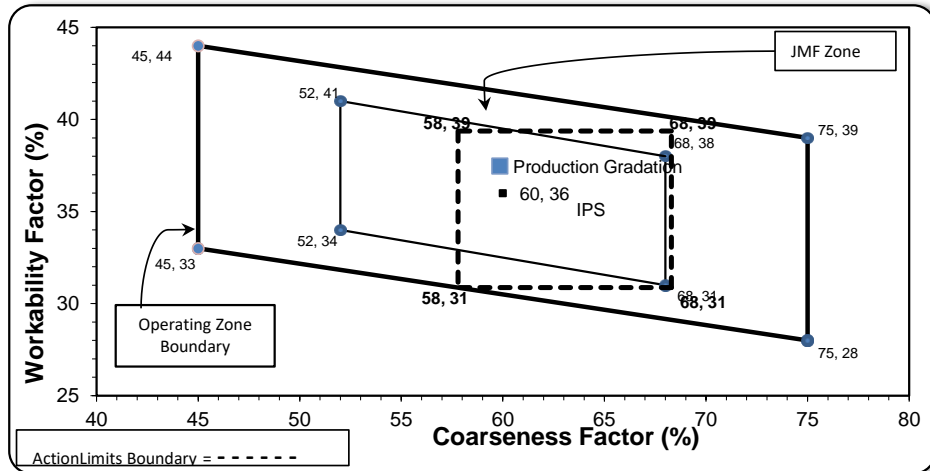
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	60	Workability Factor:	35	Adjusted WF	37.5
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
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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 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"	72.6	100.0	100.0	85.6	14.4	14.4
1/2"	38.3	97.7	100.0	67.4	18.2	32.6
3/8"	22.2	84.1	100.0	57.8	9.6	42.2
#4	3.2	10.3	98.3	40.9	16.9	59.1
#8	1.6	3.3	83.2	33.6	7.3	66.4
#16	1.4	2.5	65.4	26.4	7.1	73.6
#30	1.3	2.2	45.9	18.8	7.7	81.2
#50	1.2	2.0	22.2	9.5	9.3	90.5
#100	1.2	1.9	6.0	3.1	6.3	96.9
LBW	0.9	1.7	1.1	1.0	2.1	99.0

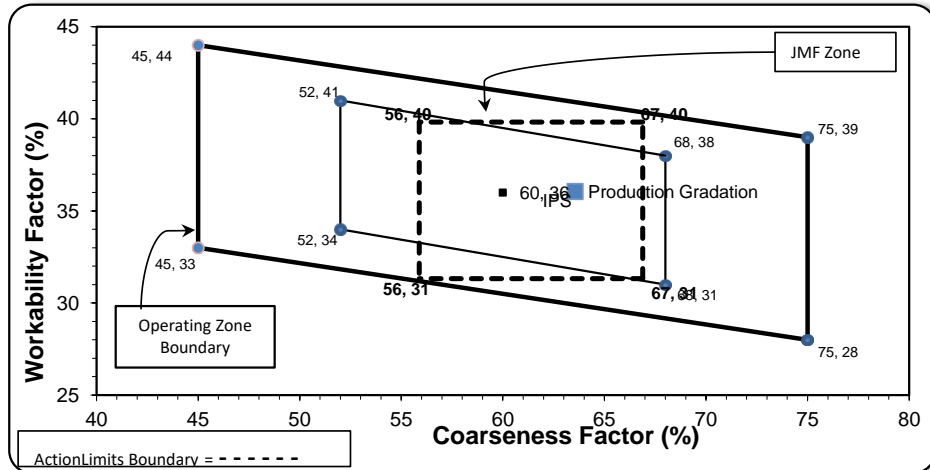
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	64	Workability Factor:	34	36.1	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:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

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	250	1.53	2.62	8.6
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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 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"	98.4	100.0	100.0	99.1	0.9	0.9
3/4"	81.6	100.0	100.0	90.2	9.0	9.8
1/2"	41.4	95.8	100.0	68.3	21.9	31.7
3/8"	24.8	86.4	100.0	58.6	9.7	41.4
#4	4.8	21.7	95.9	40.8	17.8	59.2
#8	2.2	6.0	82.4	32.9	7.9	67.1
#16	2.0	3.2	68.2	27.2	5.7	72.8
#30	1.8	2.6	51.0	20.5	6.7	79.5
#50	1.8	2.3	23.0	9.9	10.6	90.1
#100	1.7	2.2	5.6	3.2	6.7	96.8
LBW	1.4	2.0	1.1	1.3	1.9	98.7

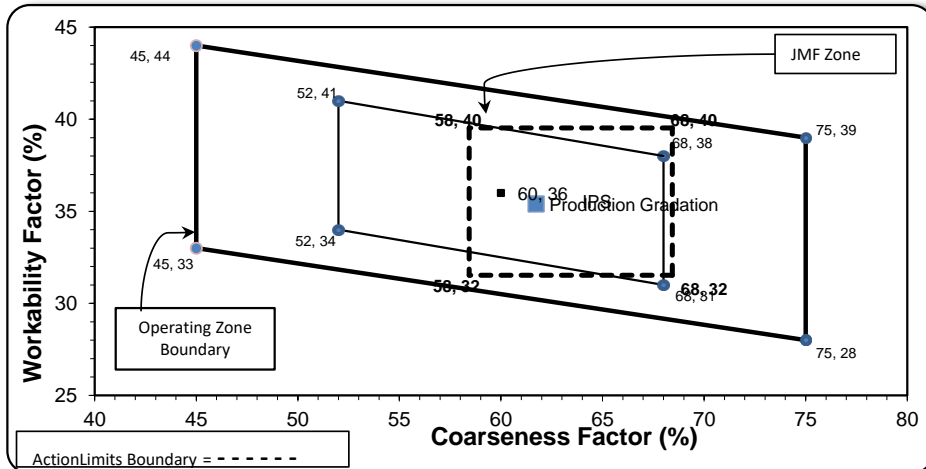
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (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	Adjusted WF	35.4
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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: 7/10/23

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 7/11/2023 through 7/17/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	53.4
26A	71-47	Presque Isle	205	1.25	2.62	7.1
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"	98.7	100.0	100.0	99.3	0.7	0.7
3/4"	81.5	100.0	100.0	90.1	9.2	9.9
1/2"	43.7	97.0	100.0	69.7	20.4	30.3
3/8"	28.3	90.6	100.0	61.1	8.7	38.9
#4	5.5	19.9	96.2	42.4	18.7	57.6
#8	2.5	4.4	80.4	33.5	8.9	66.5
#16	2.1	2.2	65.5	27.2	6.3	72.8
#30	2.0	1.7	49.9	20.9	6.3	79.1
#50	1.9	1.6	26.4	11.6	9.4	88.4
#100	1.8	1.5	6.9	3.8	7.8	96.2
LBW	1.4	1.3	1.2	1.3	2.5	98.7

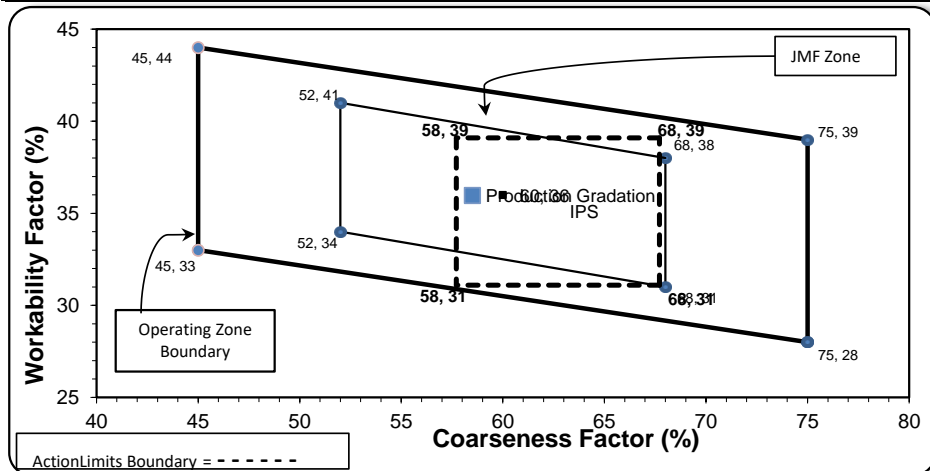
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	59	Workability Factor:	33	Adjusted WF	36.0
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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: