

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** **P-102**

Sample Date: 7/22/24

Concrete Grade: DM, 4500HP

Contractor: \_\_\_\_\_

Dates Test Represents: 7/23/2024 through 7/29/2024

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1450	8.64	2.69	49.2
26A	58-003	Stoneco	350	2.09	2.69	11.9
2NS	63-114	Highland	1150	6.95	2.65	39.0
<b>Total Wt</b>			<b>2950</b>	<b>17.68</b>		<b>100.0</b>

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



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

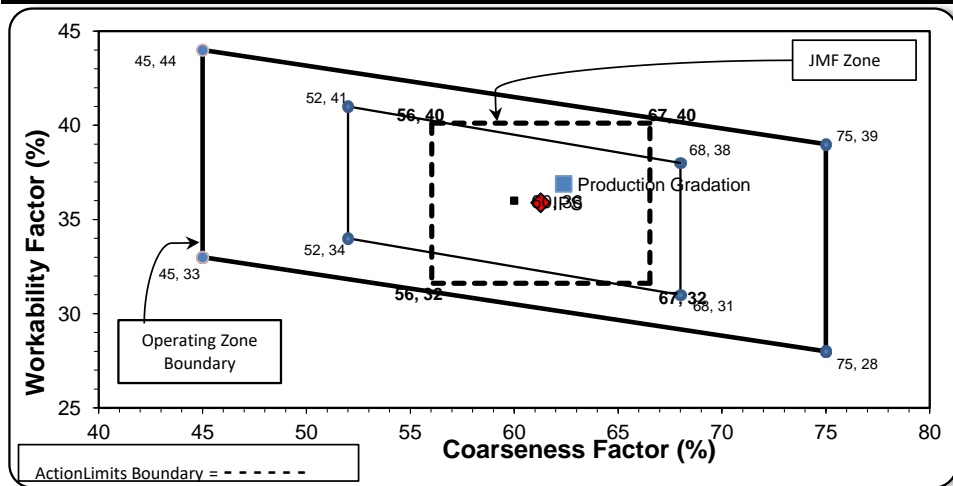
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	87.4	100.0	100.0	93.8	6.2	6.2
1/2"	41.1	99.1	100.0	70.9	22.9	29.1
3/8"	20.0	86.5	100.0	59.1	11.9	40.9
#4	2.7	16.6	99.0	41.9	17.2	58.1
#8	1.3	2.9	85.7	34.4	7.5	65.6
#16	1.1	1.9	69.1	27.7	6.7	72.3
#30	1.1	1.6	48.6	19.7	8.0	80.3
#50	1.0	1.4	19.4	8.2	11.5	91.8
#100	0.9	1.3	3.5	2.0	6.3	98.0
LBW	0.8	0.8	0.5	0.7	1.3	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 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)

<b>Coarseness Factor:</b>	<b>62</b>	<b>Workability Factor:</b>	<b>34</b>	<b>36.9</b>
---------------------------	-----------	----------------------------	-----------	-------------

<b>Coarseness Factor:</b>	<b>61</b>
<b>Workability Factor:</b>	<b>36</b>



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

# Production Gradation Report

**PLANT #:** **P-103**

Sample Date: 7/22/24

Concrete Grade: DM, 4500HP

Contractor: \_\_\_\_\_

Dates Test Represents: 7/23/2024 through 7/29/2024

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1450	8.64	2.69	49.2
26A	58-003	Stoneco	350	2.09	2.69	11.9
2NS	63-114	Highland	1150	6.95	2.65	39.0
<b>Total Wt</b>			<b>2950</b>	<b>17.68</b>		<b>100.0</b>

<----- 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"	87.4	100.0	100.0	93.8	6.2	6.2
1/2"	41.1	99.1	100.0	70.9	22.9	29.1
3/8"	20.0	86.5	100.0	59.1	11.9	40.9
#4	2.7	16.6	99.0	41.9	17.2	58.1
#8	1.3	2.9	85.7	34.4	7.5	65.6
#16	1.1	1.9	69.1	27.7	6.7	72.3
#30	1.1	1.6	48.6	19.7	8.0	80.3
#50	1.0	1.4	19.4	8.2	11.5	91.8
#100	0.9	1.3	3.5	2.0	6.3	98.0
LBW	0.8	0.8	0.5	0.7	1.3	99.3

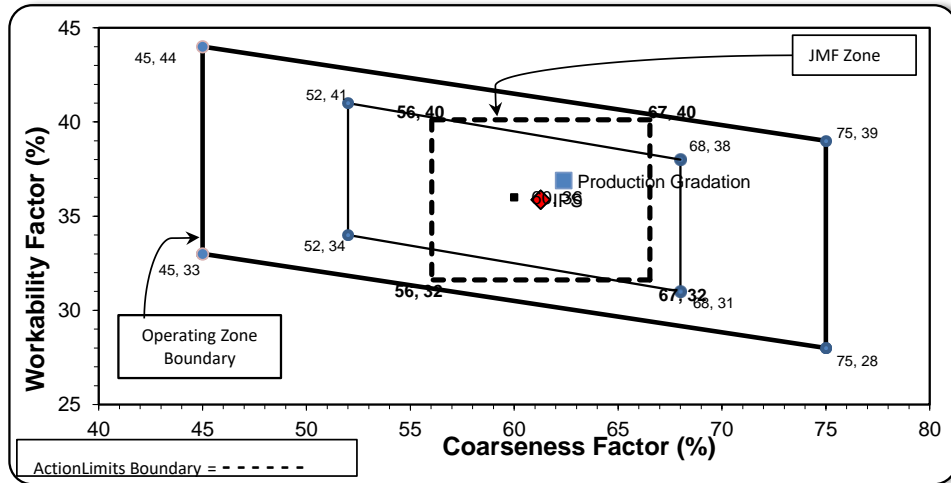
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for the 3/4" sieve when a 1.5"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

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

<b>Coarseness Factor:</b>	<b>62</b>	<b>Workability Factor:</b>	<b>34</b>	<b>36.9</b>
---------------------------	-----------	----------------------------	-----------	-------------

<b>Coarseness Factor:</b>	<b>61</b>
<b>Workability Factor:</b>	<b>36</b>

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: 7/22/24

Dates Test Represents: 7/23/2024 through 7/29/2024

Concrete Grade: DM, 4500HP

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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
<b>Total Wt</b>			<b>2905</b>	<b>17.69</b>		<b>100.0</b>

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



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

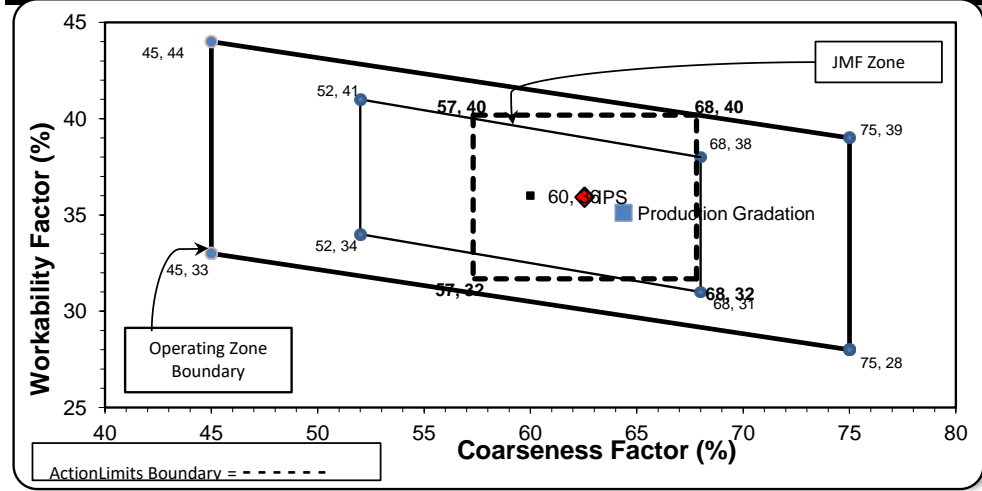
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.7	100.0	100.0	99.4	0.6	0.6
3/4"	76.3	100.0	100.0	88.2	11.2	11.8
1/2"	33.7	94.6	100.0	66.3	21.8	33.7
3/8"	16.7	82.8	100.0	56.6	9.7	43.4
#4	2.8	16.7	97.2	41.6	15.0	58.4
#8	2.1	3.5	78.8	32.6	9.0	67.4
#16	1.9	1.9	62.0	25.7	6.9	74.3
#30	1.8	1.6	46.6	19.5	6.2	80.5
#50	1.7	1.5	26.0	11.3	8.2	88.7
#100	1.6	1.4	6.0	3.3	8.0	96.7
LBW	1.4	1.2	0.7	1.1	2.2	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)

<b>Coarseness Factor:</b>	<b>64</b>	<b>Workability Factor:</b>	<b>33</b>	<b>Adjusted WF</b>	<b>35.1</b>	<b>Coarseness Factor:</b>	<b>63</b>
---------------------------	-----------	----------------------------	-----------	--------------------	-------------	---------------------------	-----------



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: 7/22/24

Concrete Grade: DM, 4500HP

Dates Test Represents: 7/23/2024 through 7/29/2024

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1605	9.82	2.62	55.2
26A	71-47	Presque Isle	150	0.92	2.62	5.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
<b>Total Wt</b>			<b>2905</b>	<b>17.69</b>		<b>100.0</b>

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



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

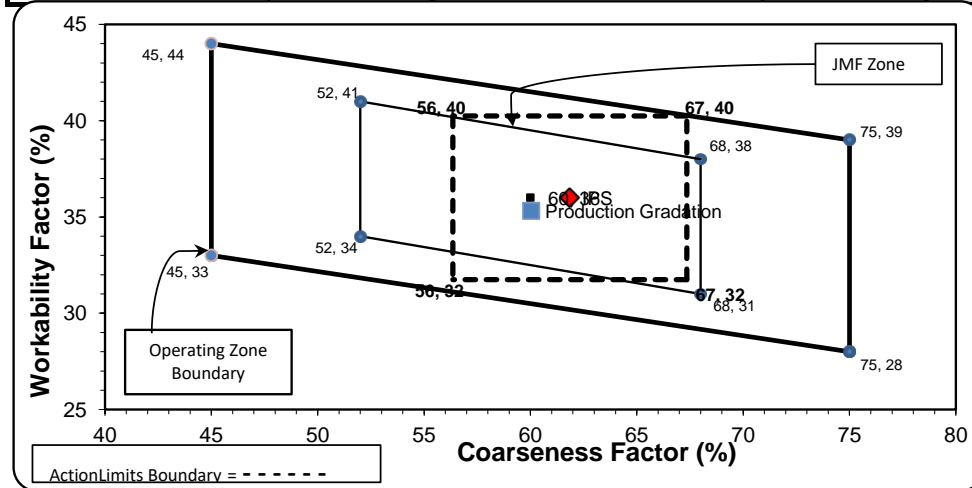
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	94.9	100.0	100.0	97.2	2.8	2.8
3/4"	79.3	100.0	100.0	88.6	8.6	11.4
1/2"	47.4	94.6	100.0	70.7	17.9	29.3
3/8"	28.6	82.8	100.0	59.7	11.0	40.3
#4	5.7	16.7	97.2	42.5	17.2	57.5
#8	2.6	3.5	78.8	32.8	9.7	67.2
#16	2.2	1.9	62.0	25.9	7.0	74.1
#30	1.9	1.6	46.6	19.6	6.3	80.4
#50	1.8	1.5	26.0	11.4	8.2	88.6
#100	1.7	1.4	6.0	3.4	8.0	96.6
LBW	1.4	1.2	0.7	1.1	2.3	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:	<b>60</b>	Workability Factor:	<b>33</b>	Adjusted WF	<b>35.3</b>	Coarseness Factor:	<b>62</b>
--------------------	-----------	---------------------	-----------	-------------	-------------	--------------------	-----------



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: 7/22/24

Concrete Grade: DM, 4500HP

Contractor: \_\_\_\_\_

Dates Test Represents: 7/23/2024 through 7/29/2024

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1450	8.64	2.69	49.2
26A	58-003	Stoneco	350	2.09	2.69	11.9
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
<b>Total Wt</b>			<b>2950</b>	<b>17.68</b>		<b>100.0</b>

<----- 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"	87.4	100.0	100.0	93.8	6.2	6.2
1/2"	41.1	99.1	100.0	70.9	22.9	29.1
3/8"	20.0	86.5	100.0	59.1	11.9	40.9
#4	2.7	16.6	98.5	41.7	17.4	58.3
#8	1.3	2.9	87.0	34.9	6.8	65.1
#16	1.1	1.9	66.3	26.6	8.3	73.4
#30	1.1	1.6	44.2	18.0	8.7	82.0
#50	1.0	1.4	20.0	8.5	9.5	91.5
#100	0.9	1.3	3.7	2.0	6.4	98.0
LBW	0.8	0.8	0.7	0.8	1.3	99.2

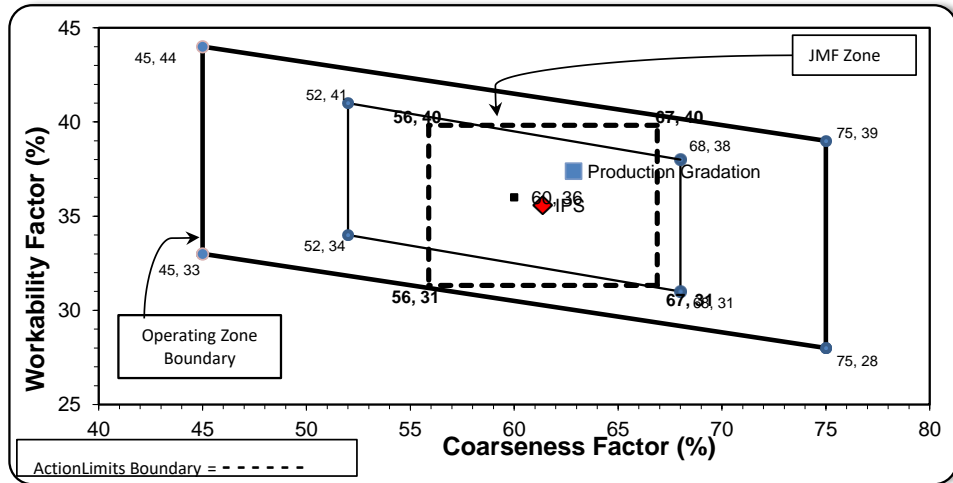
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for the 3/4" sieve when a 1.5"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

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

<b>Coarseness Factor:</b> <b>63</b>	<b>Workability Factor:</b> <b>35</b>	<b>37.4</b>
-------------------------------------	--------------------------------------	-------------

<b>Coarseness Factor:</b> <b>61</b>
-------------------------------------

<b>Workability Factor:</b> <b>36</b>
--------------------------------------



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-38**

Sample Date: 7/22/24

Concrete Grade: DM, 4500HP

Contractor: \_\_\_\_\_

Dates Test Represents: 7/23/2024 through 7/29/2024

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1450	8.64	2.69	49.2
26A	58-003	Stoneco	350	2.09	2.69	11.9
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
<b>Total Wt</b>			<b>2950</b>	<b>17.68</b>		<b>100.0</b>

<----- 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"	87.4	100.0	100.0	93.8	6.2	6.2
1/2"	41.1	99.1	100.0	70.9	22.9	29.1
3/8"	20.0	86.5	100.0	59.1	11.9	40.9
#4	2.7	16.6	98.5	41.7	17.4	58.3
#8	1.3	2.9	87.0	34.9	6.8	65.1
#16	1.1	1.9	66.3	26.6	8.3	73.4
#30	1.1	1.6	44.2	18.0	8.7	82.0
#50	1.0	1.4	20.0	8.5	9.5	91.5
#100	0.9	1.3	3.7	2.0	6.4	98.0
LBW	0.8	0.8	0.7	0.8	1.3	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

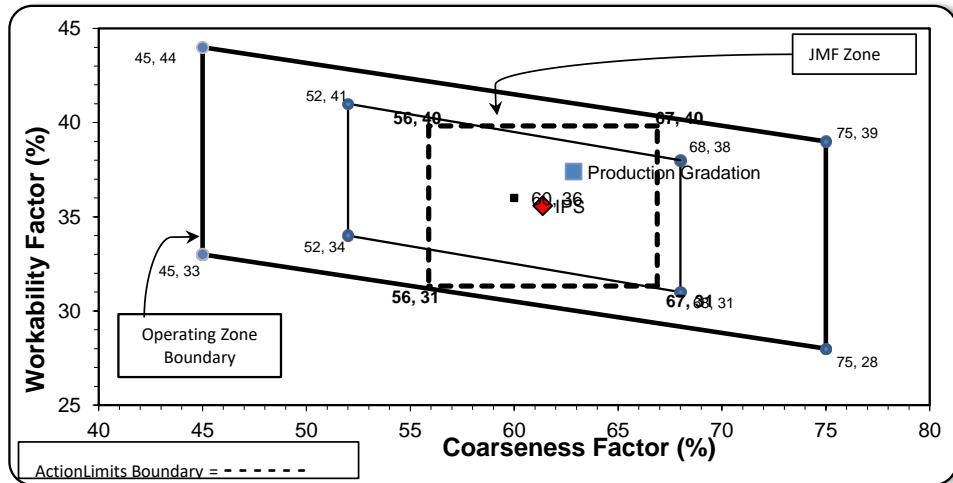
Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations  Adjusted WF Initial Production Sample (IPS)

<b>Coarseness Factor:</b>	<b>63</b>	<b>Workability Factor:</b>	<b>35</b>	<b>37.4</b>
---------------------------	-----------	----------------------------	-----------	-------------

<b>Coarseness Factor:</b>	<b>61</b>
---------------------------	-----------

<b>Workability Factor:</b>	<b>36</b>
----------------------------	-----------

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

# Production Gradation Report

**PLANT #:** P-02

Sample Date: 7/22/24

Concrete Grade: **DM, 4500HP**

Contractor: \_\_\_\_\_

Dates Test Represents: 7/23/2024 through 7/29/2024

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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
<b>Total Wt</b>			<b>2905</b>	<b>17.69</b>		<b>100.0</b>

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



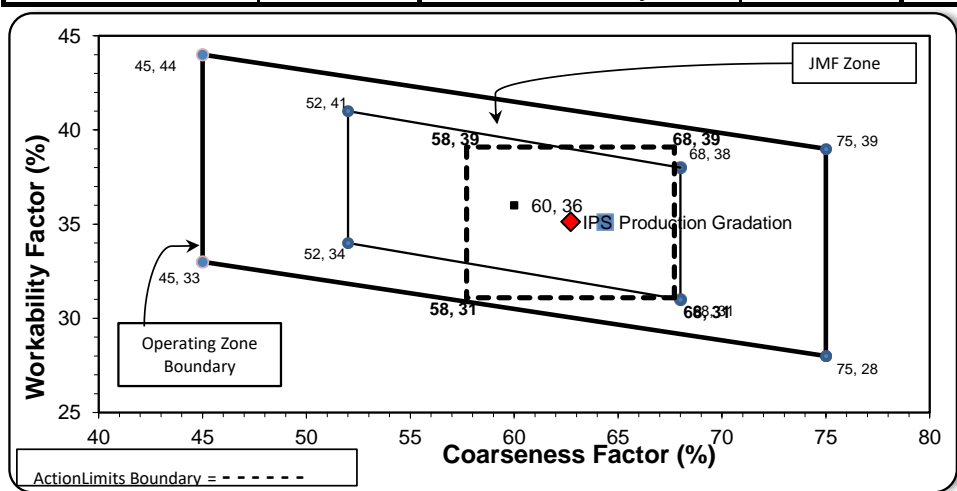
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

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	99.4	0.6	0.6
3/4"	76.3	100.0	100.0	88.2	11.2	11.8
1/2"	33.7	94.6	100.0	66.3	21.8	33.7
3/8"	16.7	82.8	100.0	56.6	9.7	43.4
#4	2.8	16.7	97.2	41.6	15.0	58.4
#8	2.1	3.5	78.8	32.6	9.0	67.4
#16	1.9	1.9	62.0	25.7	6.9	74.3
#30	1.8	1.6	46.6	19.5	6.2	80.5
#50	1.7	1.5	26.0	11.3	8.2	88.7
#100	1.6	1.4	6.0	3.3	8.0	96.7
LBW	1.4	1.2	0.7	1.1	2.2	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)

<b>Coarseness Factor:</b> 64	<b>Workability Factor:</b> 33	<b>35.1</b>	<b>Coarseness Factor:</b> 63
------------------------------	-------------------------------	-------------	------------------------------



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: