

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** P-35

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	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>

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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	77.9	100.0	100.0	89.1	10.8	10.9
1/2"	34.9	99.4	100.0	67.9	21.2	32.1
3/8"	17.2	86.5	100.0	57.7	10.2	42.3
#4	2.9	9.9	98.7	41.1	16.6	58.9
#8	1.6	5.0	87.4	35.5	5.6	64.5
#16	1.4	3.6	69.2	28.1	7.4	71.9
#30	1.3	2.8	49.4	20.2	7.9	79.8
#50	1.2	2.1	23.5	10.0	10.2	90.0
#100	1.2	1.7	5.0	2.7	7.3	97.3
LBW	1.1	1.5	0.5	0.9	1.8	99.1

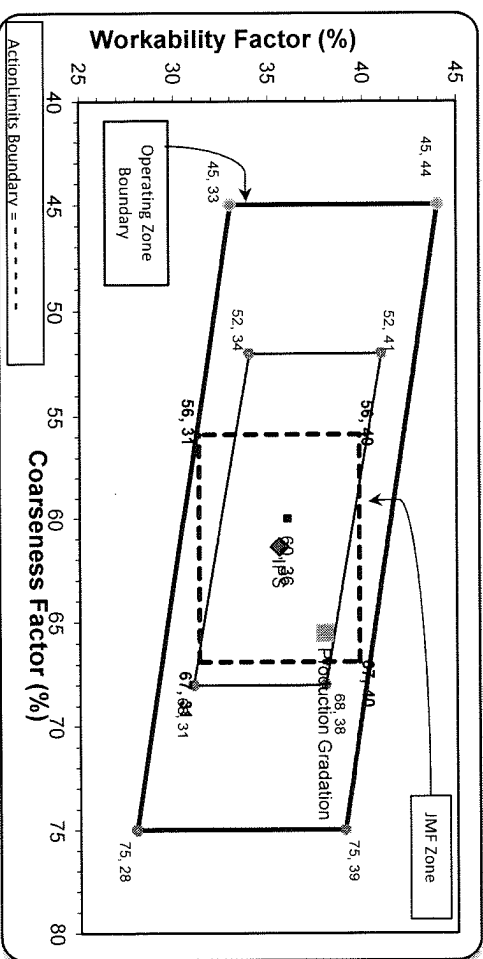
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.,  
 nom. max., #100 and #200 sieves.  
 \*Retained must be at least 4% for each sieve except max.,  
 nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for the 3/4" sieve when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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

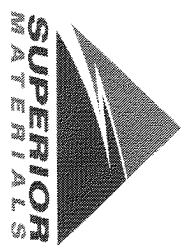
Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	35	Adjusted WF	38.0
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Coarseness Factor:	61	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



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

PREPARED BY:  
 SM, LLC Technical Service

Approved By: \_\_\_\_\_

Superior QA Samples

Location: Romulus  
Date: 7/28/2024

Material	6AA	26A	2NS
Sieve	Percent Passing		
2 in	100.0	100.0	100.0
1 1/2 in	100.0	100.0	100.0
1 in	99.8	100.0	100.0
3/4 in	77.9	100.0	100.0
1/2 in	34.9	99.4	100.0
3/8 in	17.2	86.5	100.0
No. 4	2.9	9.9	98.7
No. 8	1.6	5.0	87.4
No. 16	1.4	3.6	69.2
No. 30	1.3	2.8	49.4
No. 50	1.2	2.1	23.5
No. 100	1.2	1.7	5.0
No. 200	1.14	1.5	0.8
LBW	1.1	1.5	0.5
MO	1.9	2.5	2.7

Tested By: Douglas Storey

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-102**

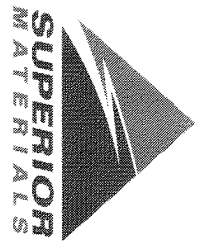
Sample Date: **7/22/24**

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

Concrete Grade: **DM, 4500HP**

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

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



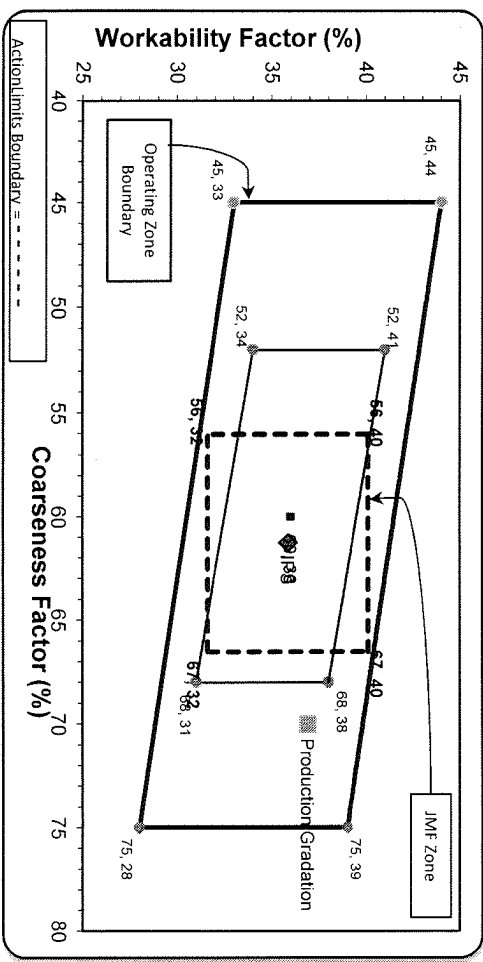
**Superior Materials, LLC**  
30701 W. 10 Mile Rd.  
Suite 500  
Farmington Hills, MI 48336

Aggr. 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>100.0</b>

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"	99.2	100.0	100.0	99.6	0.4	0.4
3/4"	68.4	100.0	100.0	84.5	15.1	15.5
1/2"	27.9	99.5	100.0	64.5	20.0	35.5
3/8"	8.2	93.2	100.0	54.1	10.4	45.9
#4	1.9	24.7	98.8	42.4	11.7	57.6
#8	1.5	7.1	84.2	34.4	8.0	65.6
#16	1.3	2.9	67.6	27.3	7.1	72.7
#30	1.3	1.7	48.4	19.7	7.6	80.3
#50	1.2	1.4	19.0	8.2	11.5	91.8
#100	1.1	1.3	3.6	2.1	6.1	97.9
LBW	1.0	1.2	0.4	0.8	1.3	99.2

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **70** Workability Factor: **34** Adjusted WF: **36.9**



Sieve	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	61	36	36.9
1.5"	61	36	36.9
1"	61	36	36.9
3/4"	61	36	36.9
1/2"	61	36	36.9
3/8"	61	36	36.9
#4	61	36	36.9
#8	61	36	36.9
#16	61	36	36.9
#30	61	36	36.9
#50	61	36	36.9
#100	61	36	36.9
LBW	61	36	36.9

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

\*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.

PREPARED BY:  
SM, LLC Technical Service

Approved By:

Superior QA Samples

Location: Novi  
 Date: 7/28/2024

Material Sieve	Coarse Agg	6AA	Inter. Agg Percent Passing	26A	2NS
2 in	100.0	100.0	100.0	100.0	100.0
1 1/2 in	100.0	100.0	100.0	100.0	100.0
1 in	44.4	99.2	100.0	100.0	100.0
3/4 in	12.5	68.4	100.0	100.0	100.0
1/2 in	5.2	27.9	94.3	99.5	100.0
3/8 in	3.1	8.2	78.0	93.2	100.0
No. 4	2.0	1.9	21.4	24.7	98.8
No. 8	1.8	1.5	7.8	7.1	84.2
No. 16	1.7	1.3	4.2	2.9	67.6
No. 30	1.7	1.3	3.1	1.7	48.4
No. 50	1.5	1.2	2.7	1.4	19.0
No. 100	1.4	1.1	2.6	1.3	3.6
No. 200	1.2	1.1	2.5	1.2	0.7
LBW	1.1	1.0	2.4	1.2	0.4
MO	1.5	2.4	3.8	3.1	3.0

Tested By: Douglas Storey

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-103**

Sample Date: **7/22/24**

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

Concrete Grade: **DM, 4500HP**

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

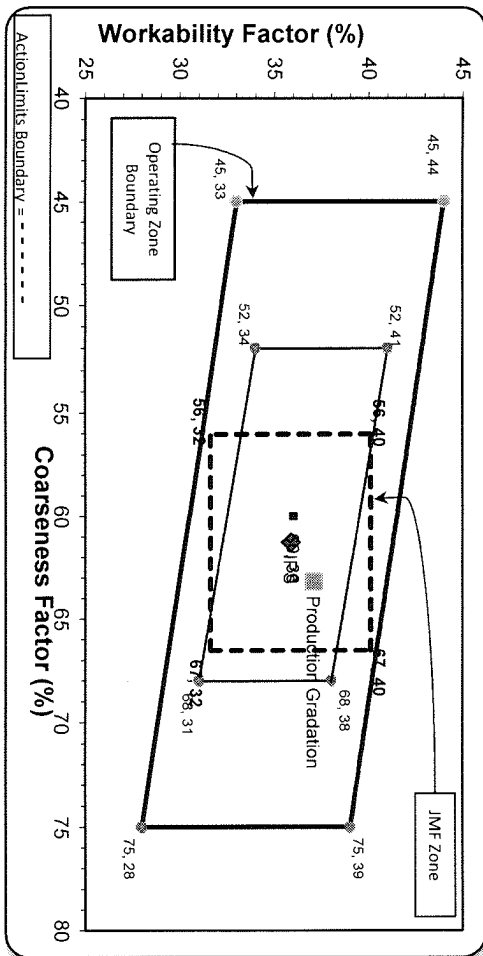
MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
6AA	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>17.68</b>
						<b>100.0</b>

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"	80.2	100.0	100.0	90.3	9.7	30.3
1/2"	38.6	99.2	100.0	69.7	20.5	30.3
3/8"	18.4	89.6	100.0	58.7	11.1	41.3
#4	3.2	5.5	98.6	40.7	18.0	59.3
#8	2.2	1.4	85.5	34.6	6.1	65.4
#16	1.9	1.1	69.3	28.1	6.5	71.9
#30	1.7	1.0	50.3	20.6	7.5	79.4
#50	1.6	0.9	20.1	8.7	11.8	91.3
#100	1.6	0.9	3.6	2.3	6.4	97.7
LBW	1.2	0.8	0.2	0.8	1.5	99.2

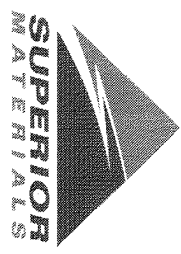
Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **63** Workability Factor: **35** Adjusted WF: **37.1**



Sieve	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	61	36	37.1
1.5"	61	36	37.1
1"	61	36	37.1
3/4"	61	36	37.1
1/2"	61	36	37.1
3/8"	61	36	37.1
#4	61	36	37.1
#8	61	36	37.1
#16	61	36	37.1
#30	61	36	37.1
#50	61	36	37.1
#100	61	36	37.1
LBW	61	36	37.1

\*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.



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

PREPARED BY:  
 SM, LLC Technical Service

Approved BY:

Superior QA Samples

Location: Brighton  
Date: 7/28/2024

Material	6AA	26A	2NS
Sieve	Percent Passing		
2 in	100.0	100.0	100.0
1 1/2 in	100.0	100.0	100.0
1 in	100.0	100.0	100.0
3/4 in	80.2	100.0	100.0
1/2 in	38.6	99.2	100.0
3/8 in	18.4	89.6	100.0
No. 4	3.2	5.5	98.6
No. 8	2.2	1.4	85.5
No. 16	1.9	1.1	69.3
No. 30	1.7	1.0	50.3
No. 50	1.6	0.9	20.1
No. 100	1.6	0.9	3.6
No. 200	1.5	0.8	0.4
LBW	1.2	0.8	0.2
MO	2.6	2.7	3.4

Tested By: Douglas Storey