Aggregate Optimization Chart

PREPARED BY:

Production Gradation Report

PLANT #: P-101 Contractor:

10/17/22 Concrete Grade: DM, 4500HP Sample Date: Dates Test Represents: 10/18/2022 10/24/2022 through

Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1460	8.93	2.62	50.2
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	75-051	Mid Michigan	1150	6.93	2.66	39.5
		Total Wt	2910	17.69		100.0

MDOT No.:

---- Verify this number is 100%

SUPERIOR MATERIALS

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"	98.5	100.0	100.0	99.2	0.8	8.0
3/4"	81.6	100.0	100.0	90.8	8.5	9.2
1/2"	40.2	93.5	100.0	69.3	21.4	30.7
3/8"	21.4	76.8	100.0	58.2	11.2	41.8
#4	2.9	20.3	99.0	42.7	15.5	57.3
#8	1.7	7.5	85.9	35.6	7.1	64.4
#16	1.5	4.3	71.3	29.4	6.2	70.6
#30	1.5	3.3	53.6	22.3	7.1	77.7
#50	1.4	3.0	22.6	9.9	12.3	90.1
#100	1.4	2.8	4.4	2.7	7.2	97.3
LBW	1.2	2.4	0.7	1.1	1.6	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 Gra	adations Aggregate Supplier Gradation	ns	Adjusted WF	Initial Product	ion Sample (IPS	3)
Coarseness Factor:	65	Workability Factor:	36	38.1	Coars	seness Factor:	
45					Work	ability Factor:	
45, 44			JMF Zone	7 	Sieve	Cumulative	
1 1			JIVII ZOIIC	J	Sieve	% Passing	R
	52, 41			- 11	2"	100.0	
ි ⁴⁰ ්		57, 39	75, 39	- 11	1.5"	100.0	
8 1		Production Grada	ation	- 11	1"	100.0	
Factor →		■ 60, 36 _S		- 11	3/4"	95.0	
2 35 -		To TPS		- 11	1/2"	70.5	
1. 1 /	52, 34	-!		- 11	3/8"	60.0	
45, 33				- 11	#4	44.4	
Available 30 Apperating 2000 Boundary		67 ₆ 8 ,1 ₃₁		- 11	#8	35.5	
Operating Zone				- 11	#16	28.5	
Boundary			75, 28	- 11	#30	21.5	
≥ 25					#50	10.2	
40 45	50 5	55 60 65 70	75	80	#100	3.1	
	Ţ,	Coarseness Factor (%)	. 3	33	LBW	1.3	
ActionLimits Boundary =							

Work	ability Factor:	35	
Sieve	Sieve Cumulative % Passing		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

SM, LLC Technical Service

Sample Date:

10/17/22 Concrete Grade: DM, 4500HP

Dates Test Represents:		10/18/2022	through	10/24/2022		
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

Contractor:

MDOT No.:

Coarseness Factor:

SUPERIOR	

Superior Materials, LLC 30701 W. 10 Mile Rd. Suite 500

Juile 300
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.

_	Total Wt	2950	17.68		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	6A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	100.0	10	0.0	100.0	100.0	0.0	0.0
1"	99.0	10	0.0	100.0	99.5	0.5	0.5
3/4"	78.5	10	0.0	100.0	88.7	10.8	11.3
1/2"	43.8	99	0.0	100.0	70.4	18.3	29.6
3/8"	22.8	7 4	l.8	100.0	57.3	13.1	42.7
#4	3.7	14	l.7	98.3	41.5	15.8	58.5
#8	1.7	4.	.9	83.7	33.9	7.6	66.1
#16	1.2	2	.2	66.4	26.7	7.2	73.3
#30	1.0	1.	.8	46.4	18.8	7.9	81.2
#50	1.0	1.	.6	21.6	9.1	9.7	90.9
#100	0.9	1.	.5	6.4	3.1	6.0	96.9
LBW	0.9	1.	.4	1.7	1.3	1.8	98.7
Production G	Gradation O Batch Plant Grad	dations () Agg	regate Supplier Gra	adations	Adjusted WF	Intial Production	on Sample (IPS

Coarseness Factor:	65	Workability Factor:	34	36.4
45 45, 44 45, 44 Operating Zone Boundary	52, 34	68, 38 60138 Production Grad	75, 39 dation	
25 40 45	50 55	60 65 70 Coarseness Factor (%)	75	80

Work	ability 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

ActionLimits Boundary = - - - - -

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP 10/17/22

10/18/2022 10/24/2022 through

Dates Test F	Represents:	10/18/2022	through	10/24/2022		
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

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

36.4

Coarseness Factor:



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

	i otai wt	2950	17.68		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	6 A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	100.0	10	0.0	100.0	100.0	0.0	0.0
1"	99.0	10	0.0	100.0	99.5	0.5	0.5
3/4"	78.5	10	0.0	100.0	88.7	10.8	11.3
1/2"	43.8	99	9.0	100.0	70.4	18.3	29.6
3/8"	22.8	74	1.8	100.0	57.3	13.1	42.7
#4	3.7	14	1.7	98.3	41.5	15.8	58.5
#8	1.7	4.	.9	83.7	33.9	7.6	66.1
#16	1.2	2	.2	66.4	26.7	7.2	73.3
#30	1.0	1.	.8	46.4	18.8	7.9	81.2
#50	1.0	1.	.6	21.6	9.1	9.7	90.9
#100	0.9	1.	.5	6.4	3.1	6.0	96.9
LBW	0.9	1.	.4	1.7	1.3	1.8	98.7

Aggregate Supplier Gradations

*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.

Coarseness Factor:	65	Workability Factor:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 68, 38 Production Gra	75, 39 75, 28	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

O Batch Plant Gradations

Work	ability 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

61

Approved BY: PREPARED BY: SM, LLC Technical Service

Schlegel

PLANT #: P-14

Pit#

58-003

58-003

19-55

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

10/17/22 Concrete Grade: DM, 4500HP

10/18/2022 10/24/2022 through Specific % ft³ Source Weight (SSD) Gravity Contribution Stoneco 1550 9.23 2.69 52.4 310 1.85 2.69 10.5 Stoneco

6.60

2.67

37.2

Contractor:

MDOT No.:



Builders Redi-Mix
30701 W. 10 Mile Rd.
Suite 500

Farmington Hills, MI 48336

1.3	
9.5	
3.1	*Maximum % Re
9.4	*Any two adjace

etained must be above the 3/8" sieve.

ent 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.

•	Total Wt	2960	17.68		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	6 A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	100.0	10	0.0	100.0	100.0	0.0	0.0
1"	99.0	10	0.0	100.0	99.5	0.5	0.5
3/4"	78.5	10	0.0	100.0	88.7	10.7	11.3
1/2"	43.8	99	9.0	100.0	70.5	18.3	29.5
3/8"	22.8	74	1.8	100.0	56.9	13.5	43.1
#4	3.7	14	1.7	99.9	40.6	16.3	59.4
#8	1.7	4	.9	89.6	34.7	5.9	65.3
#16	1.2	2	.2	69.1	26.5	8.2	73.5
#30	1.0	1	.8	43.9	17.0	9.5	83.0
#50	1.0	1	.6	15.0	6.3	10.8	93.7
#100	0.9	1	.5	3.2	1.8	4.4	98.2
LBW	0.9	1	.4	0.5	0.8	1.0	99.2
Production Gra	adation O Batch Plant Grad	ations	regate Supplier Gr	adations	Adjusted WF	Intial Production	on Sample (IPS

Batch Plant Gradations Aggregate Supplier Gradations **Production Gradation** 35 37.2 **Coarseness Factor:** 66 **Workability Factor:**

1100

Coarseness Factor: 63 **Workability Factor:** 36

	45	45, 44	JMF Zone
Workability Factor (%)	35 -		68, 40 68, 38 68, 38 Production Gradation 60, 30PS 68, 32 68, 32
Work	25	Operating Zone Boundary	75, 28
Ac	40 tionLim	45 50 its Boundary =	55 Coarseness Factor (%) 70 75 80

Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

Pit#

71-47

71-47

63-115

Agg. Class

6AA

26A

2NS

#100

LBW

10/17/22

Concrete Grade: DM, 4500HP

100.0

3.3

1.0

6.2

0.7

Sample Date: Dates Test Represents: 10/18/2022 through 10/24/2022

Total Wt

2905

۰.	10/10/2022	unougn	10/24/2022		
	Source	Waight (000)	ft ³	Specific	%
	Source	Weight (SSD)	π	Gravity	Contribution
	Presque Isle	1505	9.21	2.62	51.8
	Presque Isle	250	1.53	2.62	8.6
	Ray Rd	1150	6.95	2.65	39.6

17.69

MDOT No.:

8.0

2.3

Contractor:



<---- Verify this number is 100%

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

Sieve	6AA	26A	2NS	% Passing	% Retained	% 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	l
1"	97.0	100.0	100.0	98.4	1.6	1.6	l
3/4"	81.3	100.0	100.0	90.3	8.1	9.7	
1/2"	37.2	99.4	100.0	67.4	22.9	32.6	ı
3/8"	17.2	88.4	100.0	56.1	11.3	43.9	
#4	3.3	22.6	96.7	41.9	14.2	58.1	l
#8	1.7	5.3	78.0	32.2	9.7	67.8	n
#16	1.5	2.4	60.8	25.1	7.2	74.9	l
#30	1.4	1.9	46.3	19.2	5.8	80.8	n
#50	1.4	1.7	26.3	11.3	7.9	88.7	

1.6

1.4

*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	ations	Adjusted WF	Intial Producti	on Sample (IPS	()
Coarseness Factor: 65	Workability Factor: 32	34.7	Coars	eness Factor:	
7 45		$\neg $	Work	ability Factor:	
45, 44	JMF Zone	7 I I	Sieve	Cumulative	
52, 41		-	Sieve	% Passing	
40]	7, 40 68, 40	- 11	2"	100.0	
%	68, 38		1.5"	100.0	
	!		1"	99.3	
\$	■ 60, 36PS	- 11	3/4"	89.0	
Factor (%)	Production Gradation		1/2"	70.3	
02,04	+	- 11	3/8"	59.9	
Morkability Operating Zone Boundary	68 32	- 11	#4	41.9	
30 -	68, 33		#8	35.9	
Operating Zone			#16	27.8	Π
Boundary	75, 28		#30	18.9	
> 25			#50	6.3	Π
40 45 50 55	_ 60 _6570 75	80	#100	1.7	
	Coarseness Factor (%) ⁷⁰ 75		LBW	1.0	
ActionLimits Boundary =					

Work	ability 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

96.7

99.0

PREPARED BY: SM, LLC Technical Service

1.3

PLANT #:

Sample Date:

Concrete Grade: DM, 4500HP 10/17/22

10/24/2022		
£43	Specific	%
π	Gravity	Contribution

Dates Test F	Represents:	10/18/2022	through	10/24/2022		
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	200	1.22	2.62	6.9
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2905	17 69		100.0

Contractor:

MDOT No.:



-- Verify this number is 100%

Sι	perior Materials, LLC
30	701 W. 10 Mile Rd.
Su	ite 500
Fa	rmington Hills, MI 48336

Total W		2505		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"	98.3	100.0	100.0	99.1	0.9	0.9	
3/4"	82.1	100.0	100.0	90.4	8.7	9.6	
1/2"	38.4	99.4	100.0	67.0	23.4	33.0	
3/8"	20.6	88.4	100.0	56.7	10.3	43.3	
#4	3.5	22.6	95.6	41.3	15.4	58.7	
#8	2.2	5.3	83.5	34.6	6.7	65.4	
#16	1.9	2.4	68.6	28.3	6.3	71.7	
#30	1.9	1.9	50.0	20.9	7.4	79.1	
#50	1.8	1.7	24.7	10.9	10.1	89.1	
#100	1.7	1.6	7.4	3.9	6.9	96.1	
LBW	1.3	1.4	1.2	1.3	2.7	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.

Coarseness Factor:	66	Workability Factor: 35	37.1	Coar	seness Factor:
45 —				Wor	kability Factor:
45, 44	52, 41	JMF Z	one	Sieve	Cumulative % Passing
40	56, 40			2"	100.0
%	i	68, 38	5, 39	1.5"	100.0
<u> </u>	!	Production Gradation		1"	100.0
35 - 35 - 35 - 35 - 35 - 35 - 35 - 35 -		■ 60, 3BS	- 11	3/4"	95.0
35 -	_	il		1/2"	72.3
	52, 34	<u> </u>	- 11	3/8"	60.4
45, 33	56, 92	A7 32		#4	42.6
<u>a</u> 30 -		67 ₆₈ ,32 ₁	- 11	#8	36.0
Operating Zone	7			#16	29.5
30 Operating Zone Boundary		75	5, 28	#30	20.3
> ₂₅				#50	9.5
40 45	50 55	60 _6570 75	80	#100	3.4
	<u> </u>	Coarseness Factor (%) 75	••	LBW	1.3

Work	ability 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

Sample Date:

Production Gradation

10/17/22 Concrete Grade: DM, 4500HP

_	Dates Test F	Represents:	10/18/2022	through	10/24/2022		
	Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
	6AA	71-47	Presque Isle	1555	9.51	2.62	53.5
I	26A	71-47	Presque Isle	200	1.22	2.62	6.9
	2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6

MDOT No.:



Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

37.1

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

	Total Wt	2905	17.69		100.0	< Verify this n	umber is 100%
Sieve	6AA	26/	A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100	100.0		100.0	0.0	0.0
1.5"	100.0	100	100.0		100.0	0.0	0.0
1"	98.3	100	100.0		99.1	0.9	0.9
3/4"	82.1	100	.0	100.0	90.4	8.7	9.6
1/2"	38.4	99.	99.4		67.0	23.4	33.0
3/8"	20.6	88.	4	100.0	56.7	10.3	43.3
#4	3.5	22.	6	95.6	41.3	15.4	58.7
#8	2.2	5.3	3	83.5	34.6	6.7	65.4
#16	1.9	2.4		68.6	28.3	6.3	71.7
#30	1.9	1.9)	50.0	20.9	7.4	79.1
#50	1.8	1.7	1.7		10.9	10.1	89.1
#100	1.7	1.6		7.4	3.9	6.9	96.1
LBW	1.3	1.4		1.2	1.3	2.7	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.

Coarseness Factor:	66	Workability Factor:	35	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	67, 40 68, 38 60, 38S Production Gi	75, 39 radation 75, 28	
25 40 45 ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

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

62

Sample Date:

Dates Test Represents:

Production Gradation

10/17/22 Concrete Grade: DM, 4500HP

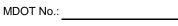
10/18/2022	through	10/24/2022		
Source	Weight (SSD)	ft ³	Specific	%
Source	weight (SSD)	π	Gravity	Contribution
Stoneco	1550	9.23	2.69	52.5

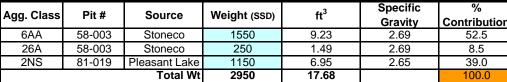
Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.4

Contractor:





SUPERIO	7

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

	l otal Wt	2950 17.6	3	100.0	< Verify this n	umber 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"	99.0	100.0	100.0	99.5	0.5	0.5
3/4"	78.5	100.0	100.0	88.7	10.8	11.3
1/2"	43.8	99.0	100.0	70.4	18.3	29.6
3/8"	22.8	74.8	100.0	57.3	13.1	42.7
#4	3.7	14.7	98.3	41.5	15.8	58.5
#8	1.7	4.9	83.7	33.9	7.6	66.1
#16	1.2	2.2	66.4	26.7	7.2	73.3
#30	1.0	1.8	46.4	18.8	7.9	81.2
#50	1.0	1.6	21.6	9.1	9.7	90.9
#100	0.9	1.5	6.4	3.1	6.0	96.9
LBW	0.9	1.4	1.7	1.3	1.8	98.7

Aggregate Supplier Gradations

*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.

Coarseness Factor:	65	Workability Factor:	34	
45 45, 44 40 45, 44 45, 33 Operating Zone Boundary	52, 41 56 52, 34 56 ,	68, 38 Production Gradati	75, 39 on	
25 40 45 ActionLimits Boundary =	50 5	Coarseness Factor (%)	75	80

Batch Plant Gradations

Workability Factor:		36	
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

Sample Date:

Production Gradation

PREPARED BY:

SM, LLC Technical Service

10/17/22 Concrete Grade: **DM**, **4500HP**

Dates Test F	Represents:	10/18/2022	through	10/24/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific	%
Agg. Class	FIL#	Source	Weight (SSD)	11.	Gravity	Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6
26A	71-47	Presque Isle	305	1.87	2.62	10.5
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.6



---- Verify this number is 100%

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

	Total Wt	2303 17.03		100.0	C Verify this number is 10076	
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"	81.3	100.0	100.0	90.3	8.1	9.7
1/2"	37.2	99.4	100.0	67.5	22.8	32.5
3/8"	17.2	88.4	100.0	56.0	11.5	44.0
#4	3.3	22.6	97.5	41.0	15.0	59.0
#8	1.7	5.3	83.7	33.1	7.9	66.9
#16	1.5	2.4	69.0	27.2	6.0	72.8
#30	1.4	1.9	49.1	19.5	7.6	80.5
#50	1.4	1.7	20.0	8.5	11.0	91.5
#100	1.3	1.6	3.6	2.2	6.3	97.8
LBW	1.1	1.4	0.9	1.1	1.1	98.9

Aggregate Supplier Gradations

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

nom. max., #100 and #200 sieves.

 $^{\star}\%$ 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.

Coarseness Factor:	66	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39	75, 28	
40 45 ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

Batch Plant Gradations

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

63

- July Bal

Sample Date:

#100

LBW

Production Gradation

10/17/22 Concrete Grade: **DM**, **4500HP**

Concrete Grade: **DM, 4500HP**

8.0

Cumulative

4.0

1.2

33.2

Dates Test F	Represents:	10/18/2022	through	10/24/2022		
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

MDOT No.:

Contractor:

6.8

2.8

Adjusted WF Intial Production Sample (IPS)

<---- Verify this number is 100%

Cumulative

96.0

98.8

Coarseness Factor:

SI	UP:	II.	RI	OR

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

Sieve	6AA	26A	2NS	% Passing	% Retained	% Retained	
2"	100.0	100.0	100.0	100.0	0.0	0.0	ı
1.5"	100.0	100.0	100.0	100.0	0.0	0.0	ı
1"	98.5	100.0	100.0	99.2	0.8	0.8	ı
3/4"	81.6	100.0	100.0	89.8	9.3	10.2	ı
1/2"	40.2	93.5	100.0	66.5	23.3	33.5	ı
3/8"	21.4	76.8	100.0	55.0	11.5	45.0	,
#4	2.9	20.3	95.8	39.3	15.7	60.7	,
#8	1.7	7.5	77.2	30.7	8.6	69.3	no
#16	1.5	4.3	61.8	24.5	6.2	75.5	,
#30	1.5	3.3	47.0	18.9	5.7	81.1	no
#50	1.4	3.0	25.8	10.7	8.1	89.3	*

2.8

2.4

Aggregate Supplier Gradations

*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.

Coarseness Factor:	65	Workability Factor:	31	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	56, 40 68, 38 68, 38	75, 39 ation 75, 28	
40 45 ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

Work	ability Factor:	36	
Sieve	Cumulative	%	Cumulative
	% Passing	Retained	% 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

1.4

Batch Plant Gradations

Approved By

Sample Date:

Production Gradation

10/17/22 Concrete Grade: DM, 4500HP

10/18/2022 10/24/2022 through

Dates Test F	Represents:	10/18/2022	through	10/24/2022		
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	250	1.53	2.62	8.6
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

34.7



---- Verify this number is 100%

ative	
ined	30701 W. 10 Mile Rd.
	Suite 500
	Farmington Hills, MI 48336

Cumulative Cumula 6AA 26A % Retained Sieve 2NS % Passing % Retail 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 97.0 100.0 100.0 98.4 1.6 1.6 3/4" 81.3 100.0 100.0 90.3 8.1 9.7 1/2' 37.2 99.4 100.0 67.4 22.9 32.6 3/8' 88.4 100.0 43.9 17.2 56.1 11.3 #4 3.3 22.6 96.7 41.9 14.2 58.1 #8 1.7 5.3 78.0 32.2 9.7 67.8 #16 1.5 2.4 60.8 25.1 7.2 74.9 #30 19.2 5.8 80.8 1.4 1.9 46.3 11.3 #50 1.4 1.7 26.3 7.9 88.7 #100 1.3 1.6 6.2 3.3 8.0 96.7 LBW 1.4 1.0 2.3

Aggregate SupplierGradations

*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.

Coarseness Factor:	65	Workability Factor:	32	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 68, 38 68, 38 68, 38 Production Gra	75, 39 adation 75, 28	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

Batch Plant Gradations

Work	ability 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