PLANT #: P-102

Pit#

58-003

58-003

81-019

Sample Date:

Agg. Class

6AA

26A

2NS

**Dates Test Represents:** 

**Production Gradation** 

Concrete Grade: DM, 4500HP

4/10/23 4/11/2023

4/11/2023	through	4/17/2023		
Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
Stoneco	1500	8.94	2.69	50.8
Stoneco	300	1.79	2.69	10.2
Pleasant Lake	1150	6.95	2.65	39.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

35.4

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	A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained	
2"	100.0	100	0.0	100.0	100.0	0.0	0.0	
1.5"	100.0	100	0.0	100.0	100.0	0.0	0.0	
1"	100.0	100	0.0	100.0	100.0	0.0	0.0	
3/4"	84.2	100	0.0	100.0	92.0	8.0	8.0	
1/2"	43.8	100	0.0	100.0	71.4	20.5	28.6	
3/8"	19.9	92	.6	100.0	58.5	12.9	41.5	
#4	2.2	13	.7	96.8	40.2	18.3	59.8	
#8	0.8	3.	7	82.4	32.9	7.3	67.1	n
#16	0.6	2.	6	66.4	26.5	6.5	73.5	1
#30	0.6	2.	2	48.8	19.6	6.9	80.4	n
#50	0.6	2.	1	23.5	9.7	9.9	90.3	1
#100	0.6	2.	0	6.5	3.0	6.6	97.0	а
LBW	0.5	1.	9	1.3	1.0	2.1	99.0	

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:	62	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	60,186, 38 60,186, 38 60,186, 38 60,186, 38	JMF Zone 75, 39	
Boundary  40 45	50 59	60 65 70 Coarseness Factor (%)	75, 28 75	80
ActionLimits Boundary =		(70)		

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

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PREPARED BY: SM, LLC Technical Service

PLANT #: P-103

Sample Date:

**Production Gradation** 

4/10/23 Concrete Grade: DM, 4500HP

Dates Lest F	Represents:	4/11/2023	through	4/17/2023		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.8
26A	58-003	Stoneco	300	1.79	2.69	10.2
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.4



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.	A	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"	84.2	100	.0	100.0	92.0	8.0	8.0
1/2"	43.8	100	0.0	100.0	71.4	20.5	28.6
3/8"	19.9	92	6	100.0	58.5	12.9	41.5
#4	2.2	13	.7	96.8	40.2	18.3	59.8
#8	0.8	3.	7	82.4	32.9	7.3	67.1
#16	0.6	2.	6	66.4	26.5	6.5	73.5
#30	0.6	2.:	2	48.8	19.6	6.9	80.4
#50	0.6	2.	1	23.5	9.7	9.9	90.3
#100	0.6	2.	)	6.5	3.0	6.6	97.0
LBW	0.5	1.5	9	1.3	1.0	2.1	99.0

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:	62	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	60µ36 68, 38 60µ36 Froduction Gradation	75, 39 75, 28	
25 40 45  ActionLimits Boundary =	50 58	Coarseness Factor (%)	75	80

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

PREPARED BY: SM, LLC Technical Service Approved BY:

PLANT #:

Sample Date:

4/10/23

Contractor:

Concrete Grade: DM, 4500HP

Dates Test F	Represents:	4/11/2023	through	4/17/2023		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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	63-115	Ray Rd	1150	6.95	2.65	39.6

MDOT No.:

SUPERIOR	

**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.

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\*% Retained must be at least 8% for the 1" sieve when

a 2" max. size (nom. Max. 1.5") aggregate is used.

	Total Wt	2905	17.69		100.0	00.0 < Verify this number		
Sieve	6AA	26	6 <b>A</b>	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"	95.4	10	0.0	100.0	97.5	2.5	2.5	
3/4"	70.5	10	0.0	100.0	84.2	13.3	15.8	
1/2"	33.0	95	5.3	100.0	63.8	20.4	36.2	
3/8"	21.9	84	1.4	100.0	57.1	6.7	42.9	
#4	3.2	17	7.3	96.9	41.3	15.9	58.7	
#8	1.7	4	.7	81.2	33.4	7.9	66.6	
#16	1.5	2	.4	65.8	27.0	6.4	73.0	
#30	1.3	1	.9	49.7	20.5	6.5	79.5	
#50	1.2	1.8		25.8	11.0	9.5	89.0	
#100	1.1	1.7		3.3	2.0	9.0	98.0	
LBW	0.9	1	.5	0.6	0.8	1.2	99.2	
Production Grad	oduction Gradation							

Production Gradation	O Batch Plant Gra	dations	Adjusted WF	Intial Producti	on Sample (IPS	)
Coarseness Factor:	64	Workability Factor: 33	35.9	Coars	eness Factor:	
7 45			$\overline{}$	Work	ability Factor:	
45, 44		IM	F Zone	Sieve	Cumulative	
	52, 41		- 25.10	Sieve	% Passing	F
40		57, 40 68, 40	- 11	2"	100.0	
│ <b>ௐ</b> ゜│		68, 38	75, 39	1.5"	100.0	
e   l		!	- 11	1"	99.3	
9		■ 60, 36PS Production Gradation	- 11	3/4"	89.0	
Eactor (%)		i i l	- 11	1/2"	70.3	
1	52, 34	<u> </u>	- 11	3/8"	59.9	
Applied 30 Operating Zong Boundary		37-22 68-32	- 11	#4	41.9	
<b>2</b> 30 -		<del>57, 22</del> <b>68</b> , 32	- 11	#8	35.9	
Operating Zone	p		. 11	#16	27.8	
Boundary			75, 28	#30	18.9	
25				#50	6.3	
40 45	50 55	5 _ 60 _6570 75	5 80	#100	1.7	
		Coarseness Factor (%)		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

PREPARED BY: SM, LLC Technical Service

PLANT #: p11

Sample Date:

4/10/23 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	4/11/2023	through	4/17/2023		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1405	8.59	2.62	48.4
26A	71-47	Presque Isle	350	2.14	2.62	12.0
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6

Contractor:

MDOT No.:

SUPERIOR
MATERIALS

**Superior Materials, LLC** 

30701 W. 10 Mile Rd. Suite 500

Farmington Hills, MI 48336

I otal Wt		2905	17.69		100.0	< Verify this n	umber is 100%
Sieve	6AA	26A		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"	96.8	10	0.0	100.0	98.5	1.5	1.5
3/4"	73.6	100.0		100.0	87.2	11.2	12.8
1/2"	34.4	95	95.3		67.7	19.5	32.3
3/8"	20.1	84	.4	100.0	59.5	8.2	40.5
#4	3.3	17	17.3		42.0	17.5	58.0
#8	1.8	4.	7	84.4	34.8	7.1	65.2
#16	1.7	2	2.4		28.6	6.3	71.4
#30	1.6	1.	9	51.2	21.3	7.3	78.7
#50	1.6	1.	8	25.2	11.0	10.3	89.0
#100	1.5	1.	7	6.5	3.5	7.5	96.5
LBW	1.3	1.	5	0.8	1.1	2.4	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 Grade	dations	ns	Adjusted WF	Intial Producti	ion Sample (IPS	)
Coarseness Factor	: 62	Workability Factor:	35	37.3	Coars	seness Factor:	
7 45				$\neg  \top$	Worl	kability Factor:	
45, 44			JMF Zone	7 I I	Sieve	Cumulative	
-	52, 41		31111 20110	<b>-</b>	Sieve	% Passing	
40 1	56	67, 40		- 11	2"	100.0	
(%)		68, 38	75, 39	- 11	1.5"	100.0	
		Production Gradation		- 11	1"	100.0	
9		■ 60,3MBS		- 11	3/4"	95.0	
<b>Factor</b> 35		i i		- 11	1/2"	72.3	
1. 1 <b>7</b>	52, 34	<del>!</del> !		- 11	3/8"	60.4	Ī
Operating Zon Boundary	50	<b>67</b> <sub>68, 31</sub>		- 11	#4	42.6	
<u>a</u> 30 -		68, 31		- 11	#8	36.0	
Operating Zon	e		<b>⊸</b>	- 11	#16	29.5	
Boundary			75, 28	- 11	#30	20.3	Ī
<b>&gt;</b> 25 <b>  </b>				_	#50	9.5	
40 45	50 55	60 65 70	75	80	#100	3.4	L
		Coarseness Factor (%) <sup>70</sup>	-		LBW	1.3	
ActionLimits Boundary = -							

Work	ability 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"	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

PREPARED BY: SM, LLC Technical Service

Presque Isle

Presque Isle

Smelter Bay

**Total Wt** 

Batch Plant Gradations

1405

350

1150

2905

PLANT #: P-32

Pit#

71-47

71-47

95-013

Sample Date:

Agg. Class

6AA

26A

2NS

**Dates Test Represents:** 

**Production Gradation** 

4/10/23 Concrete Grade: **DM, 4500HP** 

4/11/2023	through	4/17/2023		
Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution

8.59

2.14

6.95

17.69

2.62

2.62

2.65

48.4

12.0

39.6

100.0

37.3

MDOT	Nο		

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:



<---- Verify this number is 100%

ned	Cumulative % Retained	<u>Superior Materials, LLC</u> 30701 W. 10 Mile Rd.
	0.0	Suite 500
	0.0	Farmington Hills, MI 48336

Cumulative 6AA 26A % Retain Sieve 2NS % Passing 2" 100.0 100.0 100.0 100.0 0.0 1.5" 100.0 100.0 100.0 100.0 0.0 0.0 96.8 100.0 100.0 98.5 1.5 1.5 3/4" 73.6 100.0 100.0 87.2 11.2 12.8 1/2' 34.4 95.3 100.0 67.7 19.5 32.3 3/8' 84.4 100.0 59.5 8.2 40.5 20.1 #4 3.3 17.3 96.7 42.0 17.5 58.0 #8 1.8 4.7 84.4 34.8 7.1 65.2 #16 1.7 2.4 69.4 28.6 6.3 71.4 #30 78.7 1.6 1.9 51.2 21.3 7.3 #50 1.6 1.8 25.2 11.0 10.3 89.0 #100 1.5 1.7 6.5 3.5 7.5 96.5 LBW 1.5 1.1 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:	62	Workability Factor:	35	
45 45, 44 45, 33 Operating Zone Boundary	52, 34	56, 40 67, 40 68, 38 Production Gadation 60, 38S	75, 39	
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

PREPARED BY: SM, LLC Technical Service Approved By