Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-101 Contractor:

Sample Date: 9/5/22 Concrete Grade: DM, 4500HP **Dates Test Represents:** 9/6/2022 9/12/2022 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.:

Coarseness Factor:

SUPERIOR MATERIALS

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.

	Total Wt	2910 17.69		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"	98.3	100.0	100.0	99.1	0.9	0.9
3/4"	83.3	100.0	100.0	91.6	7.5	8.4
1/2"	39.2	98.4	100.0	69.3	22.3	30.7
3/8"	21.8	88.5	100.0	59.6	9.8	40.4
#4	3.3	22.7	98.9	43.1	16.5	56.9
#8	1.8	5.2	84.8	35.0	8.1	65.0
#16	1.7	2.9	69.5	28.6	6.3	71.4
#30	1.6	2.5	53.6	22.2	6.4	77.8
#50	1.5	2.3	27.2	11.7	10.5	88.3
#100	1.4	2.1	8.0	4.1	7.7	95.9
LBW	1.3	1.9	1.3	1.4	2.7	98.6

Coarseness Factor: Workability Factor: 35 37.5 62 45 JMF Zone 45, 44 75, 39 Workability Factor (%) Production Gradation 52, 34 45, 33 Operating Zone 75, 28 Boundary 50 Coarseness Factor (%) 70 75 80 ActionLimits Boundary = - - - - -

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"	95.0	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

Approved By:

Pleasant Lake

Total Wt

Batch Plant Gradations

PLANT #: P-102

Pit#

58-003

58-003

81-019

Dates Test Represents:

Production Gradation

Agg. Class

6AA

26A

2NS

Sample Date: 9/5/22 Concrete Grade: **DM**, **4500HP**

1150

2950

9/6/2022 9/12/2022 through Specific ft³ Source Weight (SSD) Gravity Contribution Stoneco 1400 8.34 2.69 47.5 400 2.38 2.69 13.6 Stoneco

2.65

39.0

100.0

36.4

6.95

17.68

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:



---- Verify this number is 100%

Retained

0.0

0.0

0.0

Farmington Hills, MI 48336

Cumulative Cumulative 6AA 26A % Retained Sieve 2NS % Passing % Retained 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 1" 100.0 100.0 100.0 100.0 0.0 0.0 3/4" 87.8 100.0 100.0 94.2 5.8 5.8 1/2' 45.1 99.2 100.0 73.8 20.4 26.2 3/8' 74.2 100.0 59.3 14.5 40.7 21.6 #4 3.8 14.4 99.1 42.4 16.9 57.6 #8 1.6 5.7 83.1 33.9 8.5 66.1 #16 1.7 3.8 65.4 26.8 7.1 73.2 #30 1.5 3.1 45.8 19.0 7.8 81.0 #50 1.3 2.8 22.8 9.9 9.1 90.1 #100 1.3 2.7 7.0 3.7 6.2 96.3 LBW 0.8 2.2 1.2 2.5

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:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	40 67 40 68, 38 60, Stoduction Gradation	75, 39	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

Work	Workability Factor:		
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:

Sample Date:

Production Gradation

9/5/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	9/6/2022	through	9/12/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2050	17 69		100.0

MDOT No.:

Contractor:

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	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"	100.0	10	0.0	100.0	100.0	0.0	0.0
3/4"	87.8	10	0.0	100.0	94.2	5.8	5.8
1/2"	45.1	99	0.2	100.0	73.8	20.4	26.2
3/8"	21.6	74	l.2	100.0	59.3	14.5	40.7
#4	3.8	14	.4	99.1	42.4	16.9	57.6
#8	1.6	5	.7	83.1	33.9	8.5	66.1
#16	1.7	3	.8	65.4	26.8	7.1	73.2
#30	1.5	3	.1	45.8	19.0	7.8	81.0
#50	1.3	2	.8	22.8	9.9	9.1	90.1
#100	1.3	2	.7	7.0	3.7	6.2	96.3
LBW	0.8	2	.2	1.4	1.2	2.5	98.8

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:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	60, 25 duction Gradation	75, 39	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

O Batch Plant Gradations

Work	Workability Factor:		
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

PREPARED BY: SM, LLC Technical Service Approved BY:

Schlegel

Batch Plant Gradations

PLANT #: P-14

19-55

Sample Date:

2NS

Production Gradation

9/5/22 Concrete Grade: DM, 4500HP

6.60

2.67

37.2

37.5

Dates Test F	Represents:	9/6/2022	through	9/12/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1460	8.70	2.69	49.3
26A	58-003	Stoneco	400	2.38	2.69	13.5

1100

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:



ulative	Dulluel 3 Neul-IVIIX
tained	30701 W. 10 Mile Rd.

63

Suite 500

Farmington Hills, MI 48336

	3 -						
	Total Wt	2960	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"	87.8	100	0.0	100.0	94.0	6.0	6.0
1/2"	45.1	99.2		100.0	72.8	21.2	27.2
3/8"	21.6	74.2		100.0	57.8	15.0	42.2
#4	3.8	14.4		100.0	41.0	16.9	59.0
#8	1.6	5.	5.7		35.0	6.0	65.0 r
#16	1.7	3.	8	68.5	26.8	8.2	73.2
#30	1.5	3.1		44.8	17.8	9.0	82.2 r
#50	1.3	2.	8	15.8	6.9	10.9	93.1
#100	1.3	2.	7	3.1	2.2	4.7	97.8
LBW	0.8	2.	2	0.4	0.8	1.3	99.2

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:	35	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 40 68, 40 68, 38 Production Gra 60, 36PS 68, 33	JMF Zone 75, 39	
25 40 45 ActionLimits Boundary =	50 55	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"	89.0	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

Aggregate Optimization Chart

PLANT #: P-12

Contractor:

Sample Date: 9/5/22 Dates Test Represents: 9/6/2022 Concrete Grade: DM, 4500HP

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	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

through

---- Verify this number is 100%

SUPER	ALS

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	ĺ
1.5"	100.0	100.0	100.0	100.0	0.0	0.0	ı
1"	97.5	100.0	100.0	98.7	1.3	1.3	ı
3/4"	79.4	100.0	100.0	89.3	9.4	10.7	ı
1/2"	43.3	90.7	100.0	69.8	19.5	30.2	ı
3/8"	21.8	76.2	100.0	57.4	12.4	42.6	ı
#4	3.7	13.4	96.4	41.2	16.2	58.8	ı
#8	2.2	3.7	77.6	32.2	9.1	67.8	n
#16	2.0	1.8	61.1	25.4	6.8	74.6	ı
#30	1.9	1.3	46.8	19.6	5.8	80.4	n
#50	1.8	1.2	26.2	11.4	8.2	88.6	ı
#100	1.7	1.1	6.8	3.7	7.7	96.3	а
LBW	1.5	1.0	0.8	1.2	2.5	98.8	ĺ

9/12/2022

*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 Gradation	ons	ns	Adjusted WF	Intial Product	ion Sample (IPS	3)
Coarseness Factor	: 63	Workability Factor:	32	34.7	Coars	seness Factor:	Г
7 45				$\neg \top$	Worl	cability Factor:	
45, 44			JMF Zone	$\neg \vdash \vdash$	Sieve	Cumulative	Г
-	52, 41		31111 20110	I	Sieve	% Passing	
_ 40 1	57,	40 68, 40		- 11	2"	100.0	
%		68, 38	75, 39	- 11	1.5"	100.0	
-		!		- 11	1"	99.3	
A		■ 60, 36PS		- 11	3/4"	89.0	Г
Factor (%)		Production Gradation		- 11	1/2"	70.3	
1	52, 34	!		- 11	3/8"	59.9	
Morkability Operating Zor Boundary	37.	68 32		- 11	#4	41.9	
2 30	,	68, 32 68, 31		- 11	#8	35.9	Г
Operating Zor	ne		→	- 11	#16	27.8	
Boundary			75, 28	- 11	#30	18.9	Г
> ₂₅					#50	6.3	
40 45	50 55	60 65 70	75	80	#100	1.7	
		Coarseness Factor (%) ⁷⁰			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

Sample Date:

LBW

Production Gradation

9/5/22 Concrete Grade: DM, 4500HP 9/12/2022

Dates Test Represents:		9/6/2022	through	9/12/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1355	8.29	2.62	46.6
26A	71-47	Presque Isle	400	2.45	2.62	13.8
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2005	17.60		100.0

MDOT No.:

Contractor:



---- 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"	99.2	100.0	100.0	99.6	0.4	0.4	
3/4"	82.3	100.0	100.0	91.7	7.9	8.3	
1/2"	32.1	90.7	100.0	67.0	24.7	33.0	
3/8"	14.2	76.2	100.0	56.7	10.3	43.3	١.
#4	2.9	13.4	95.9	41.2	15.5	58.8	١.
#8	2.4	3.7	82.6	34.3	6.8	65.7	n
#16	2.1	1.8	67.5	27.9	6.4	72.1	١.
#30	2.0	1.3	47.6	20.0	8.0	80.0	n
#50	1.8	1.2	23.7	10.4	9.6	89.6]
#100	1.7	1.1	7.5	3.9	6.5	96.1	а

Aggregate Supplier Gradations

1.3

1.3

36.8

1.0

*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.

62

*% 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:	34	
45 45, 44 45, 33 Operating Zone Boundary	52, 41	67, 40 68, 38 60, 38S Pioduction 7,82	JMF Zone 75, 39	
25 40 45 ActionLimits Boundary =	50 55 	Coarseness Factor (%) ⁷⁰	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"	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

98.7

Coarseness Factor:

2.6

Adjusted WF Intial Production Sample (IPS)

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP 9/5/22

Dates Test F	Represents:	9/6/2022	through	9/12/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2050	17 68		100.0

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

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

d	

*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	26A	1	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"	87.8	100.	0	100.0	94.2	5.8	5.8
1/2"	45.1	99.2	2	100.0	73.8	20.4	26.2
3/8"	21.6	74.2	74.2		59.3	14.5	40.7
#4	3.8	14.4		99.1	42.4	16.9	57.6
#8	1.6	5.7		83.1	33.9	8.5	66.1
#16	1.7	3.8		65.4	26.8	7.1	73.2
#30	1.5	3.1		45.8	19.0	7.8	81.0
#50	1.3	2.8		22.8	9.9	9.1	90.1
#100	1.3	2.7		7.0	3.7	6.2	96.3
LBW	0.8	2.2		1.4	1.2	2.5	98.8

Aggregate Supplier Gradations

Coarseness Factor:	62	Workability Factor:	34	36.4
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41 56 ; 52, 34 56 ,	68, 38 60, Broduction Gradation 31 67, 84, 31	75, 39	
40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%) ⁷⁰	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"	89.1	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:

Concrete Grade: DM, 4500HP 9/5/22

MDOT No.:	

Contractor:

Coarseness Factor:

35.7

Dates Test Represents: 9/6/2022 9/12/2022 through Specific ft³ Agg. Class Pit# Source Weight (SSD) 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 2005 17.60

Varify this number is 100%

SUPERIOR MATERIALS

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

	i otai Wt	2905	17.69		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"	97.5	10	0.0	100.0	98.7	1.3	1.3	
3/4"	79.4	10	0.0	100.0	89.3	9.4	10.7	
1/2"	43.3	90).7	100.0	69.7	19.7	30.3	
3/8"	21.8	76	6.2	100.0	57.0	12.6	43.0	
#4	3.7	13	3.4	97.7	40.3	16.7	59.7	
#8	2.2	3	.7	83.6	33.2	7.1	66.8	n
#16	2.0	1	.8	68.9	27.3	5.9	72.7	
#30	1.9	1	.3	51.0	20.4	6.9	79.6	n
#50	1.8	1	.2	22.6	9.6	10.8	90.4	
#100	1.7	1	.1	3.9	2.5	7.1	97.5	а
LBW	1.5	1	.0	0.6	1.1	1.4	98.9	
Production G	radation O Batch Plant Grac	lations	regate Supplier Gr	adations	Adjusted WF	Intial Production	on Sample (IPS	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.

Coarseness Factor:	64	Workability Factor:	33	
45 45, 44			JMF Zone	$\overline{\mathbb{T}}$
Morkability Factor (%) 35 Operating Zone Boundary	52, 41	58, 39 68, 38	75, 39	
25 +		58, 31	75, 28	
40 45 ActionLimits Boundary =	50	Coarseness Factor (%) ⁷⁰	75	80

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

Sample Date:

Production Gradation

9/5/22 Concrete Grade: DM, 4500HP

9/12/2022

Dates Test F	Represents:	9/6/2022	through	9/12/2022		
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

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

34.4

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

	i otai wt	2905	17.69		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"	98.3	10	0.0	100.0	99.1	0.9	0.9
3/4"	83.3	10	0.0	100.0	90.8	8.3	9.2
1/2"	39.2	98	3.4	100.0	66.3	24.5	33.7
3/8"	21.8	88	3.5	100.0	56.0	10.3	44.0
#4	3.3	22	2.7	96.2	39.8	16.2	60.2
#8	1.8	5	.2	80.6	31.9	7.9	68.1
#16	1.7	2	.9	65.9	26.1	5.8	73.9
#30	1.6	2	.5	50.9	20.3	5.8	79.7
#50	1.5	2	.3	27.6	11.4	8.9	88.6
#100	1.4	2	.1	8.4	4.1	7.3	95.9
LBW	1.3	1	.9	1.6	1.5	2.6	98.5

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:	32	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	56, 40 68, 38 Froduction Grad	JMF Zone 75, 39 dation 75, 28	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	 80

Batch Plant Gradations

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"	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

Sample Date:

LBW

Production Gradation

9/5/22 Concrete Grade: DM, 4500HP

9/6/2022 9/12/2022 **Dates Test Represents:** through Specific ft³ Pit# Source Weight (SSD) Gravity 71-47 Presque Isle 1505 9.21 2.62 51.8

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

1.2

34.7

Contractor:

Agg. Class Contribution 6AA 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

<---- Verify this number is 100%

SUPERIOR MATERIALS	

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

Cumulative Cumulative 6AA 26A % Retained Sieve 2NS % Passing % 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" 97.5 100.0 100.0 98.7 1.3 1.3 3/4" 79.4 100.0 100.0 89.3 9.4 10.7 1/2' 43.3 90.7 100.0 69.8 19.5 30.2 3/8' 76.2 100.0 12.4 42.6 21.8 57.4 #4 3.7 13.4 96.4 41.2 16.2 58.8 #8 2.2 3.7 77.6 32.2 9.1 67.8 #16 2.0 1.8 61.1 25.4 6.8 74.6 #30 5.8 80.4 1.9 1.3 46.8 19.6 #50 1.8 1.2 26.2 11.4 8.2 88.6 #100 1.7 1.1 6.8 3.7 7.7 96.3

1.0

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:	63	Workability Factor:	32	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 68, 39 68, 38 68, 38 Production Gradation 58, 31	75, 39	
40 45 ActionLimits Boundary =	50 5	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"	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