## Aggregate Optimization Chart

## **Production Gradation Report**

**PLANT #:** P-101 Contractor:

Sample Date: 5/9/22 Concrete Grade: DM, 4500HP Dates Test Represents: 5/10/2022 5/16/2022 MDOT No.: through

Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	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

**Coarseness Factor:** 

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

	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"	99.0	100.0	100.0	99.5	0.5	0.5
3/4"	86.3	100.0	100.0	93.1	6.4	6.9
1/2"	39.4	98.3	100.0	69.4	23.7	30.6
3/8"	20.9	87.6	100.0	59.0	10.4	41.0
#4	2.9	17.3	98.5	42.2	16.9	57.8
#8	1.9	3.7	83.3	34.3	7.9	65.7
#16	1.7	2.3	68.3	28.1	6.2	71.9
#30	1.6	2.2	53.3	22.1	6.0	77.9
#50	1.5	2.0	29.2	12.5	9.6	87.5
#100	1.4	1.9	7.3	3.8	8.7	96.2
LBW	1.2	1.8	0.6	1.0	2.8	99.0
Production G	radation O Batch Plant Gradat	ions    Aggregate Supplier G	radations	Adjusted WF	Initial Producti	on Sample (IPS

\*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	36.8
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 Production Gradation 60, 3βS	75, 28	
40 45  ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

Workability Factor:		35	
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"	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

62

PREPARED BY: SM, LLC Technical Service Pleasant Lake

Batch Plant Gradations

**PLANT #:** P-102

81-019

Sample Date:

2NS

**Production Gradation** 

Concrete Grade: DM, 4500HP

6.95

2.65

38.9

34.9

oates Test F	Represents:	5/10/2022	through	5/16/2022		
∖gg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1525	9.09	2.69	51.6
26A	58-003	Stoneco	280	1.67	2.69	9.5

1150

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

Contractor:



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

	Total Wt	2955	17.71		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"	100.0	100.0	1	100.0	100.0	0.0	0.0
3/4"	82.8	100.0		100.0	91.1	8.9	8.9
1/2"	42.6	99.6		100.0	70.3	20.8	29.7
3/8"	21.4	84.9		100.0	58.0	12.3	42.0
#4	3.2	24.9		96.6	41.6	16.4	58.4
#8	1.2	7.2		79.8	32.4	9.2	67.6
#16	0.9	3.5		61.5	24.7	7.6	75.3
#30	0.8	2.7		43.6	17.6	7.1	82.4
#50	0.6	2.4		20.9	8.7	9.0	91.3
#100	0.6	2.3		6.5	3.1	5.6	96.9
LBW	0.5	2.0		0.8	0.8	2.3	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.

Coarse	eness Factor:	62	Workability Factor:	32	
45	45, 44			JMF Zone	
(%) La (%)		52, 41 <b>56</b>	40 67 40	75, 39	
llity Factor (%)	45, 33	52, 34	■ 60µ8§ ■ Production G adation		
Morkability	Operating Zone Boundary		32 67 32 <sub>8, 31</sub>	75, 28	
40	45	50 55	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"	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

Source

Stoneco

Stoneco

Pleasant Lake

PLANT #: P-103

Pit#

58-003

58-003

81-019

Agg. Class

6AA

26A

2NS

Concrete Grade: DM, 4500HP

ft<sup>3</sup>

9.53

1.22

6.95

2.65

Sample Date: 5/9/22 **Dates Test Represents:** 5/10/2022 5/16/2022 through

Weight (SSD)

1600

205

1150

		Ν
Specific	%	
Gravity	Contribution	
2.69	54.1	
2.69	6.9	

MDOT No.:

Contractor:



CUDERV	
SUPERIO	LS

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

Farmington Hills, MI 48336

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

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

\*% Retained must be at least 4% for each sieve except max.,

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

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

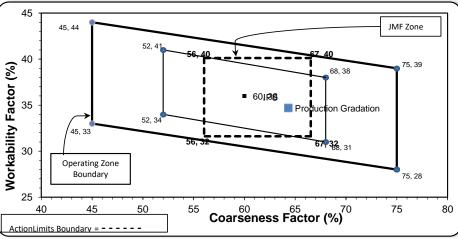
61

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

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

	Total Wt	2955	17.71		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	6 <b>A</b>	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"	82.8	100	0.0	100.0	90.7	9.3	9.3
1/2"	42.6	99	9.6	100.0	68.9	21.8	31.1
3/8"	21.4	84	1.9	100.0	56.4	12.5	43.6
#4	3.2	24	1.9	96.6	41.1	15.3	58.9
#8	1.2	7.	.2	79.8	32.2	8.8	67.8
#16	0.9	3.	.5	61.5	24.7	7.5	75.3
#30	0.8	2.	.7	43.6	17.6	7.1	82.4
#50	0.6	2.	.4	20.9	8.6	9.0	91.4
#100	0.6	2.	.3	6.5	3.0	5.6	97.0
LBW	0.5	2.	.0	0.8	0.7	2.3	99.3

Aggregate Supplier Gradations O Batch Plant Gradations **Production Gradation** Adjusted WF Intial Production Sample (IPS) **Coarseness Factor:** 64 **Workability Factor:** 32 34.7 **Coarseness Factor: Workability Factor:** 



		• • •	
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"	89.2	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:

6AA

2.1

1.6

Sample Date:

Sieve

#100

LBW

5/9/22 Concrete Grade: DM, 4500HP 5/16/2022

Cumulative

3.0

1.3

**2NS** 

4.3

Contractor:

% Retained

7.9

1.7

Dates Test F	Represents:	5/10/2022	through	5/16/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6
26A	71-47	Presque Isle	255	1.56	2.62	8.8
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

26A

2.0

1.5

MDOT No.:

Cumulative

97.0

98.7

---- Verify this number is 100%

SUPERIOR MATERIALS	

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

				% Passing		% Retained	ı
2"	100.0	100.0	100.0	100.0	0.0	0.0	l
1.5"	100.0	100.0	100.0	100.0	0.0	0.0	ı
1"	99.4	100.0	100.0	99.7	0.3	0.3	ı
3/4"	85.8	100.0	100.0	92.7	7.0	7.3	ı
1/2"	47.2	95.0	100.0	72.3	20.4	27.7	ı
3/8"	26.6	82.9	100.0	60.6	11.7	39.4	ı
#4	4.4	24.2	96.2	42.5	18.1	57.5	ı
#8	2.7	7.4	78.5	33.1	9.4	66.9	n
#16	2.4	3.4	62.5	26.3	6.8	73.7	ı
#30	2.3	2.4	46.8	19.9	6.4	80.1	n
#50	2.2	2.1	24.2	10.9	9.0	89.1	ı

\*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 O Bate	ch Plant Gradations	Aggregate Supplier Gradation	ons	Adjusted WF	Intial Production	on Sample (IPS)
Coarseness Factor:	59	Workability Factor:	33	35.6	Coars	eness Factor:
7 45				$\neg \top$	Work	ability Factor:
45, 44			JMF Zone	7 I I	Sieve	Cumulative
52	2, 41			<b>-</b>	Sieve	% Passing
1 40 ]	57, 40	68, 40		- 11	2"	100.0
<b>(%)</b>	i -	68, 38	75, 39	- 11	1.5"	100.0
t   1	!			- 11	1"	99.3
<b>2</b>		Pro60c16h Gradation		- 11	3/4"	89.0
35 d	_ i =			- 11	1/2"	70.3
	2, 34	i		- 11	3/8"	59.9
45, 33	37.22	68 32		- 11	#4	41.9
<del>2</del> 30	0.,0	<b>68, 32</b>		- 11	#8	35.9
Morkapility  Operating Zone Boundary				- 11	#16	27.8
Boundary			75, 28	- 11	#30	18.9
25					#50	6.3
40 45 50	55 _	60 65 70	75	80	#100	1.7
	Coars	seness 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

5/9/22

PLANT #: P-32

Sample Date:

**Production Gradation** 

Concrete Grade: DM, 4500HP

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

38.1

Dates Test F	Represents:	5/10/2022	through	5/16/2022		
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	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

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	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

SUPERMATER	RIOR

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	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"	99.4	10	0.0	100.0	99.7	0.3	0.3
3/4"	88.9	10	0.0	100.0	94.1	5.6	5.9
1/2"	52.3	95	.0	100.0	74.1	19.9	25.9
3/8"	30.6	82	.9	100.0	61.7	12.4	38.3
#4	5.0	24	.2	97.2	42.8	18.9	57.2
#8	2.6	7.	4	85.2	35.6	7.2	64.4
#16	2.2	3	4	70.8	29.4	6.2	70.6
#30	2.1	2	4	51.8	21.8	7.6	78.2
#50	2.0	2	1	25.3	11.2	10.6	88.8
#100	2.0	2	0	7.4	4.1	7.1	95.9
LBW	1.7	1.	5	1.7	1.7	2.5	98.3

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.

45 45, 44 JMF Zone  40 40 52, 41 56, 40 67, 40 75, 39  Production Gradation 68, 38 60, 38S  Operating Zone Boundary  75, 28	Coarseness Factor	60	Workability Factor:	36	
<b>X</b> 1	45, 44  Ao About 19 April 19 A	52, 34	Production Gradates 68, 38		
40 45 50 55 Coarseness Factor (%) 70 75  ActionLimits Boundary =	40 45	50 5	Coarseness Factor (%) <sup>70</sup>	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

Sample Date:

**Production Gradation** 

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

Dates Test F	Represents:	5/10/2022	through	5/16/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.1
26A	58-003	Stoneco	205	1.22	2.69	6.9
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9
		Total Wt	2955	17.71		100.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

34.7



**Superior Materials, LLC** 

30701 W. 10 Mile Rd. Suite 500

Farmington Hills, MI 48336

	Total Wt	2955	17.71		100.0	< Verify this n	umber is 100%
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"	100.0	10	0.0	100.0	100.0	0.0	0.0
3/4"	82.8	10	0.0	100.0	90.7	9.3	9.3
1/2"	42.6	99	9.6	100.0	68.9	21.8	31.1
3/8"	21.4	84	1.9	100.0	56.4	12.5	43.6
#4	3.2	24	l.9	96.6	41.1	15.3	58.9
#8	1.2	7	.2	79.8	32.2	8.8	67.8
#16	0.9	3	.5	61.5	24.7	7.5	75.3
#30	0.8	2	.7	43.6	17.6	7.1	82.4
#50	0.6	2	.4	20.9	8.6	9.0	91.4
#100	0.6	2	.3	6.5	3.0	5.6	97.0
LBW	0.5	2	.0	0.8	0.7	2.3	99.3

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.

61

\*% 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:	32	
45 45, 44 45, 44 Operating Zon Boundary	52, 34	60, 40 68, 38 Production Gradatio		
Boundary 25 40 45 ActionLimits Boundary =	50	55 Coarseness Factor (%)	75, 28 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

Batch Plant Gradations

**PLANT #:** P-36

Sample Date:

**Production Gradation** 

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

Dates Test F	Represents:	5/10/2022	through	5/16/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1600	9.79	2.62	55.1
26A	71-47	Presque Isle	205	1.25	2.62	7.1
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

35.2



Superior Materials, LLC	2
30701 W. 10 Mile Rd.	
Suite 500	
Farmington Hills, MI 4833	36

	Total Wt	2905 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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	85.8	100.0	100.0	92.2	7.5	7.8
1/2"	47.2	95.0	100.0	70.6	21.6	29.4
3/8"	26.6	82.9	100.0	58.4	12.2	41.6
#4	4.4	24.2	96.3	40.6	17.8	59.4
#8	2.7	7.4	81.0	32.7	7.9	67.3 r
#16	2.4	3.4	65.3	26.3	6.4	73.7
#30	2.3	2.4	46.6	19.1	7.2	80.9 r
#50	2.2	2.1	20.9	9.3	9.8	90.7
#100	2.1	2.0	3.0	2.4	6.8	97.6 a
LBW	1.6	1.5	0.6	1.2	1.2	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:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 60, 36 PrdPSction Gre dation 58, 31	75, 28	
40 45  ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

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"	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:

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

5/16/2022 through

Dates Test Represents:		5/10/2022	through	5/16/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	Specific 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	44-051	Krake Willis Rd	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

Contractor:

MDOT No.:

--- Verify this number is 100%

**Coarseness Factor:** 

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

Farmington Hills, MI 48336

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

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

\*% Retained must be at least 4% for each sieve except max.,

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

63

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

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

				10010		
Sieve	6AA	26A	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	100.0	100.0	0.0	0.0
1"	99.0	100.0	100.0	99.5	0.5	0.5
3/4"	86.3	100.0	100.0	92.9	6.6	7.1
1/2"	39.4	98.3	100.0	68.4	24.5	31.6
3/8"	20.9	87.6	100.0	57.7	10.7	42.3
#4	2.9	17.3	96.5	39.8	17.9	60.2
#8	1.9	3.7	79.6	31.5	8.3	68.5
#16	1.7	2.3	63.2	25.0	6.5	75.0
#30	1.6	2.2	47.0	18.9	6.2	81.1
#50	1.5	2.0	26.4	11.0	7.9	89.0
#100	1.4	1.9	9.6	4.6	6.4	95.4
LBW	1.2	1.8	1.0	1.2	3.4	98.8

O Batch Plant Gradations Aggregate Supplier Gradations **Production Gradation** Adjusted WF Intial Production Sample (IPS) Coarseness Factor: Workability Factor: 32 62 34.0

36 **Workability Factor:** % 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" 19.4 29.7 70.3 3/8' 11.2 59.1 40.9 #4 16.3 57.2 42.8 #8 35.5 7.3 64.5 #16 29.0 6.5 71.0 #30 21.2 7.7 78.8 #50 9.8 90.2 11.5 3.7 #100 6.1 96.3 LBW 2.5 98.8

45 40	45, 44	JMF Zone  58, 40  68, 38  75, 39
Workability Factor (%)	52, 34	■ 60, 36 <sub>IPS</sub> ■ Production Gratiation  58, 32
<b>Workab</b> 30	Operating Zone Boundary	75, 28
4	10 45 50 5 mits Boundary =	Coarseness Factor (%) 70 75 80

Sample Date:

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

Dates Test F	Represents:	5/10/2022	through	5/16/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6
26A	71-47	Presque Isle	255	1.56	2.62	8.8
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

MDOT No.:

**Coarseness Factor:** 

Contractor:

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.

63

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

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

26A	2NS	Cumulative		
		% Passing	% Retained	Cumulative % Retained
100.0	100.0	100.0	0.0	0.0
100.0	100.0	100.0	0.0	0.0
100.0	100.0	99.7	0.3	0.3
100.0	100.0	92.7	7.0	7.3
95.0	100.0	72.3	20.4	27.7
82.9	100.0	60.6	11.7	39.4
24.2	96.2	42.5	18.1	57.5
7.4	78.5	33.1	9.4	66.9
3.4	62.5	26.3	6.8	73.7
2.4	46.8	19.9	6.4	80.1
2.1	24.2	10.9	9.0	89.1
2.0	4.3	3.0	7.9	97.0
1.5	0.8	1.3	1.7	98.7
3	2.0	2.0 4.3 1.5 0.8	2.0 4.3 3.0 1.5 0.8 1.3	2.0     4.3     3.0     7.9       1.5     0.8     1.3     1.7

**Coarseness Factor: Workability Factor:** 33 35.6 59 45 JMF Zone 45, 44 52, 41 Workability Factor (%) ■ Producti6p Gradation 52, 34 Operating Zone Boundary 75, 28 25 Coarseness Factor (%)<sup>70</sup> 45 50 55 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"	95.1	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