Aggregate Optimization Chart

Mid Michigan

Batch Plant Gradations

Production Gradation Report

PLANT #: P-101

75-051

Sample Date:

2NS

Production Gradation

8/1/22 Concrete Grade: **DM**, **4500HP**

Dates Test Represents: 8/2/2022 8/8/2022 through Specific % ft³ Agg. Class Pit# Weight (SSD) Source 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

1150

MDOT No.:

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:

Contractor:



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"	97.8	100.0)	100.0	98.9	1.1	1.1
3/4"	85.3	100.0)	100.0	92.6	6.3	7.4
1/2"	43.6	98.2		100.0	71.5	21.1	28.5
3/8"	21.9	86.2		100.0	59.4	12.1	40.6
#4	3.3	24.6		99.0	43.3	16.1	56.7
#8	2.0	5.8		85.3	35.3	8.0	64.7
#16	1.8	3.2		70.1	28.9	6.4	71.1
#30	1.6	2.6		53.2	22.1	6.8	77.9
#50	1.5	2.3		26.3	11.4	10.7	88.6
#100	1.4	2.1		6.8	3.6	7.8	96.4
LBW	1.3	1.8		1.0	1.2	2.4	98.8

Aggregate Supplier Gradations

6.93

2.66

39.5

*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:	35	37.8
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 Production Gradation 60, 36s 6768,131	75, 39 75, 28	
40 45 ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

Work	ability 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

Approved By

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP

8/1/22 8/2/2022 8/8/2022 through

-	MDOT No.:	
1		

Dates Test F	Represents:	8/2/2022	through	8/8/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
		Total Wt	2950	17.68		100.0

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.7

SUPERIOR MATERIALS

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	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"	79.7	100.0	100.0	89.7	10.3	10.3
1/2"	46.8	99.5	100.0	72.9	16.8	27.1
3/8"	17.8	84.0	100.0	56.6	16.3	43.4
#4	1.3	14.3	99.1	40.7	15.8	59.3
#8	0.9	4.6	85.3	34.2	6.6	65.8 ı
#16	0.6	2.9	68.1	27.1	7.0	72.9
#30	0.5	2.2	51.0	20.4	6.8	79.6 ı
#50	0.4	2.0	27.0	10.9	9.4	89.1
#100	0.4	1.9	8.8	3.8	7.1	96.2
LBW	0.4	1.6	1.6	1.0	2.8	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:	66	Workability Factor:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Froduction 60 86	JMF Zone 75, 39 Gradation 75, 28	
25	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"	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

6AA

0.4

0.4

0.4

O Batch Plant Gradations

Sample Date:

Sieve

#50

#100

LBW

Production Gradation

8/1/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	8/2/2022	through	8/8/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.8
264	58-003	Stonoco	300	1 70	2.60	10.2

26A

2.0

1.9

1.6

% Retained

9.4

7.1

2.8

Adjusted WF Intial Production Sample (IPS)

Cumulative

10.9

3.8

1.0

36.7

2NS

27.0

8.8

Contractor:

MDOT No.:

Cumulative

89.1

96.2

99.0

Coarseness Factor:

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
		Total Wt	2950	17.68		100.0

---- Verify this number is 100%

SUPERIOR MATERIALS	

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

Farmington Hills, MI 48336

				70 Fassing		76 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"	79.7	100.0	100.0	89.7	10.3	10.3
1/2"	46.8	99.5	100.0	72.9	16.8	27.1
3/8"	17.8	84.0	100.0	56.6	16.3	43.4
#4	1.3	14.3	99.1	40.7	15.8	59.3
#8	0.9	4.6	85.3	34.2	6.6	65.8
#16	0.6	2.9	68.1	27.1	7.0	72.9
#30	0.5	2.2	51.0	20.4	6.8	79.6

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.

Coars	seness Factor:	66	Workability Factor:	34	
45	45, 44			JMF Zone	
40 d		52, 41 56	68, 38	75, 39	
Workability Factor (%)	45, 33	52, 34	60) RIS	Gradalion	
	Operating Zone Boundary		32 67,328, 31	75, 28	
	0 45 mits Boundary =	50 55	Coarseness Factor (%) ⁷⁰	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 Approved BY:

Sample Date:

8/1/22 Concrete Grade: DM, 4500HP

MDOT No.:	

Contractor:

Dates Test Represents:		8/2/2022	through	8/8/2022		
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	150	0.92	2.62	5.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

---- Verify this number is 100%

SU		
MAT		

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	0.8
3/4"	82.3	100.0	100.0	90.2	9.0	9.8
1/2"	39.5	95.5	100.0	66.3	23.9	33.7
3/8"	20.2	85.9	100.0	55.2	11.2	44.8
#4	2.2	28.8	96.2	40.8	14.4	59.2
#8	1.3	8.1	76.6	31.5	9.3	68.5
#16	1.1	3.7	59.7	24.4	7.0	75.6
#30	1.1	2.8	43.9	18.1	6.3	81.9
#50	1.0	2.5	25.4	10.7	7.4	89.3
#100	1.0	2.3	7.6	3.7	7.1	96.3
LBW	0.8	2.0	1.5	1.1	2.5	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 Grad	dations Aggregate Supplier Gradations	Adjusted WF	Intial Production	on Sample (IPS))
Coarseness Factor:	65	Workability Factor: 31	34.0	Coars	eness Factor:	
7 45			$\neg \top$	Work	ability Factor:	
45, 44		JMF Zone	$\neg \sqcap$	Sieve	Cumulative	
	52, 41			Sieve	% Passing	
_ 40]		57, 40 68, 40		2"	100.0	
?		68, 38		1.5"	100.0	
-		! 1		1"	99.3	
│ 유 _		■ 60, 36PS		3/4"	89.0	
Factor (%)		■ Production Gradation		1/2"	70.3	
	52, 34	1 Todaction Gradation		3/8"	59.9	
Operating Zone Boundary		77-22 68-32		#4	41.9	
2 30 -		57, 22 68, 32		#8	35.9	
Operating Zone]			#16	27.8	
Boundary		75, 28		#30	18.9	
> ₂₅	J			#50	6.3	
40 45	50 55	60 65 70 75	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

Sample Date:

8/1/22 Concrete Grade: DM, 4500HP 8/8/2022

Dates Test Represents:		8/2/2022	through	8/8/2022		
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

MDOT No.:



---- Verify this number is 100%

Contractor:

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

Coarseness Factor:

*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.,

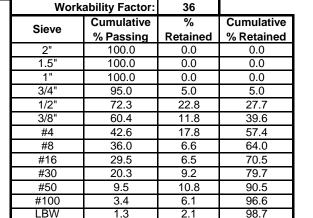
nom. max., #100 and #200 sieves.

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

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

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"	97.4	100.0	100.0	98.6	1.4	1.4
3/4"	84.8	100.0	100.0	91.9	6.7	8.1
1/2"	45.5	95.5	100.0	70.5	21.3	29.5
3/8"	22.7	85.9	100.0	57.7	12.9	42.3
#4	3.9	28.8	96.0	42.1	15.6	57.9
#8	2.4	8.1	82.3	34.4	7.7	65.6
#16	2.0	3.7	66.8	27.8	6.7	72.2
#30	1.8	2.8	47.7	20.0	7.7	80.0
#50	1.7	2.5	23.3	10.3	9.7	89.7
#100	1.5	2.3	7.2	3.8	6.5	96.2
LBW	1.1	2.0	1.3	1.2	2.6	98.8
Production Grad	dation O Batch Plant Gra	dations Aggregate Supplier (Gradations	Adjusted WF	Intial Production	on Sample (IPS

F	Production Gradation	Batch Plant Gra	dations Aggregate Supplier Grad	dations	Adjusted V
	Coarseness Factor:	65	Workability Factor:	34	36.9
	45 45, 44			JMF Zone	



62

Workability Factor (%) 20 20 20 20 20 20 20 20 20 20 20 20 20	45, 44 52, 41 56, 40 68, 38 Production Gradation 60, 3BS Operating Zone Boundary		
o 25		75, 28 75 8	30
ActionLin	nits Boundary =		

Sample Date:

Production Gradation

8/1/22 Concrete Grade: DM, 4500HP 8/8/2022

Agg. Class Pit # Source Weight (ssp) ft³ Specific Gravity % Contrib 6AA 58-003 Stoneco 1500 8.94 2.69 50 6AA 58-003 Stoneco 1500 8.94 2.69 50	
	-
000 50 000 00 400	.8
26A 58-003 Stoneco 300 1.79 2.69 10.).2
2NS 81-019 Pleasant Lake 1150 6.95 2.65 39	_

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.7

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

	Total Wt	2950 17.68		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	100.0	100.0	0.0	0.0
3/4"	79.7	100.0	100.0	89.7	10.3	10.3
1/2"	46.8	99.5	100.0	72.9	16.8	27.1
3/8"	17.8	84.0	100.0	56.6	16.3	43.4
#4	1.3	14.3	99.1	40.7	15.8	59.3
#8	0.9	4.6	85.3	34.2	6.6	65.8 r
#16	0.6	2.9	68.1	27.1	7.0	72.9
#30	0.5	2.2	51.0	20.4	6.8	79.6 r
#50	0.4	2.0	27.0	10.9	9.4	89.1
#100	0.4	1.9	8.8	3.8	7.1	96.2 a
LBW	0.4	1.6	1.6	1.0	2.8	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.

Coarsenes	ss Factor:	66	Workability Factor:	34	
45 45 45 45 45 45 45 45 45 45 45 45 45 4	45, 33	52, 41		JMF Zone 75, 39	
ActionLimits Bo	Operating Zone Boundary 45 undary =		5 Coarseness Factor (%)	75, 28 75	80

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"	89.1	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:

8/1/22 Concrete Grade: DM, 4500HP

8/8/2022 through

MDOT No.:		

Dates Test F	Represents:	8/2/2022	through	8/8/2022		
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	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

Contractor:

35.3

---- Verify this number is 100%

Coarseness Factor:

SUPERIOR MATERIALS

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

		2000				di 110070
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	0.8
3/4"	82.3	100.0	100.0	90.2	9.0	9.8
1/2"	39.5	95.5	100.0	66.3	24.0	33.7
3/8"	20.2	85.9	100.0	54.9	11.3	45.1
#4	2.2	28.8	94.7	39.1	15.9	60.9
#8	1.3	8.1	83.2	32.8	6.3	67.2 r
#16	1.1	3.7	68.4	26.8	6.0	73.2
#30	1.1	2.8	49.4	19.5	7.3	80.5 r
#50	1.0	2.5	19.2	8.0	11.5	92.0
#100	1.0	2.3	3.4	2.0	6.0	98.0 a
LBW	0.8	2.0	0.4	0.7	1.3	99.3
Production C	Gradation O Batch Plant Gra	dations	adations	Adjusted WF	Intial Production	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:	67	Workability Factor:	33	
45 45, 44			JMF Zone	$\overline{\mathbb{n}}$
(%) 40 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	52, 41	58, 39 68, 38	75, 39	
Morkability Factor (%) 35 45, 33 Operating Zone Boundary	52, 34	■ 60, 36 IPS ■ Production 0	Gradation	
Operating Zone Boundary		58,31	75, 28	
25 40 45 ActionLimits Boundary =	50 5	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

Sample Date:

Dates Test Represents:

Production Gradation

8/1/22 Concrete Grade: DM, 4500HP

8/2/2022 8/8/2022 through

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

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Farmington Hills, MI 48336

	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"	97.8	100.0	100.0	98.8	1.2	1.2
3/4"	85.3	100.0	100.0	91.9	6.9	8.1
1/2"	43.6	98.2	100.0	68.7	23.2	31.3
3/8"	21.9	86.2	100.0	55.9	12.8	44.1
#4	3.3	24.6	96.2	39.9	16.0	60.1
#8	2.0	5.8	80.2	31.9	8.1	68.1 r
#16	1.8	3.2	66.2	26.3	5.6	73.7
#30	1.6	2.6	50.4	20.1	6.1	7 9.9 r
#50	1.5	2.3	24.8	10.4	9.8	89.6
#100	1.4	2.1	6.4	3.3	7.0	96.7
LBW	1.3	1.8	0.4	1.0	2.3	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.

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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.

Coarseness Factor:	65	Workability Factor:	32	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 40 68, 38 60, 36 IPS Production Grad	JMF Zone 75, 39 dation 75, 28	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	 80

Batch Plant Gradations

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"	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:

Production Gradation

8/1/22 Concrete Grade: DM, 4500HP

8/8/2022

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

34.0

Dates Test F	Represents:	8/2/2022	through	8/8/2022		
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	150	0.92	2.62	5.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

MDOT No.:

Superior Materials, LLC

30701 W. 10 Mile Rd.

Suite 500

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	l otal 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	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"	98.5	100	0.0	100.0	99.2	0.8	0.8
3/4"	82.3	100	0.0	100.0	90.2	9.0	9.8
1/2"	39.5	95	.5	100.0	66.3	23.9	33.7
3/8"	20.2	85	.9	100.0	55.2	11.2	44.8
#4	2.2	28	.8	96.2	40.8	14.4	59.2
#8	1.3	8.	1	76.6	31.5	9.3	68.5
#16	1.1	3.	7	59.7	24.4	7.0	75.6
#30	1.1	2.	8	43.9	18.1	6.3	81.9
#50	1.0	2.	5	25.4	10.7	7.4	89.3
#100	1.0	2.	3	7.6	3.7	7.1	96.3
LBW	0.8	2.	0	1.5	1.1	2.5	98.9

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: 31
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 75, 39 68, 38 75, 39 68, 38 Production Gradation
Operating Zone Boundary 25 40 45 ActionLimits Boundary =	50 5	58, 31 688, 381 75, 28 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

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