## **Aggregate Optimization Chart**

Presque Isle

Ray Rd

Batch Plant Gradations

## **Production Gradation Report**

PLANT #: P-101

Pit#

71-47

71-47

63-115

Sample Date:

Agg. Class

6AA

26A

2NS

**Production Gradation** 

Concrete Grade: DM, 4500HP 3/21/22

1.83

6.95

2.62

2.65

10.3

39.5

Dates Test Represents: 3/22/2022 3/28/2022 through Specific % ft<sup>3</sup> Weight (SSD) Source Gravity Contribution Presque Isle 1460 8.93 2.62 50.2

300

1150

MDOT No.:

Contractor:

Adjusted WF Initial Production Sample (IPS)

**Coarseness Factor:** 



Superior Materials, L	<u>LC</u>
30701 W. 10 Mile Rd.	
Suite 500	
Farmington Hills, MI 483	336

į	oo i io i itay ita	1100	0.00	2.00	00.0		
Total Wt		2910	17.72		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	26A		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"	98.8	10	0.0	100.0	99.4	0.6	0.6
3/4"	87.0	10	0.0	100.0	93.5	5.9	6.5
1/2"	44.4	96	6.5	100.0	71.7	21.7	28.3
3/8"	25.8	85	5.8	100.0	61.3	10.4	38.7
#4	5.0	16	6.2	97.0	42.5	18.8	57.5
#8	2.5	4	4.1		33.0	9.5	67.0
#16	2.0	2	2.6		26.2	6.8	73.8
#30	1.9	2	2.2		19.8	6.5	80.2
#50	1.8	2	2.0		11.5	8.3	88.5
#100	1.7	1	1.9		2.7	8.7	97.3
LBW	1.6	1	.7	0.6	1.2	1.5	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:	58	Workability Factor:	33	35.5
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 Production Essadation 57, 31	75, 39	
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

Sample Date:

#30

#50

#100

LBW

**Production Gradation** 

Concrete Grade: DM, 4500HP

[	Dates Test F	Represents:	3/22/2022	through	3/28/2022		
	Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
	6AA	58-003	Stoneco	1400	8.34	2.69	47.4
I	26A	58-003	Stoneco	405	2.41	2.69	13.7

3.8

3.4

3.2

2.9

Aggregate Supplier Gradations

Contractor:

79.6

89.5

96.3

Coarseness Factor:

MDOT No.:

	10   10   10   11   11   11   11   11			0,-0,-0		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.4
26A	58-003	Stoneco	405	2.41	2.69	13.7
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9
		Total Wt	2955	17.71		100.0

---- Verify this number is 100%

7.7

9.9

6.8

1.9

Adjusted WF Intial Production Sample (IPS)

20.4

10.5

3.7

1.8

38.3

48.8

23.8

6.5

SUPERIOR	R

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

Cumulative Cumulative 6AA 26A 2NS % Retained Sieve % 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 0.0 100.0 100.0 100.0 100.0 0.0 0.0 3/4" 90.0 100.0 100.0 95.3 4.7 4.7 1/2' 47.8 99.9 100.0 75.3 20.0 24.7 3/8' 89.8 100.0 63.1 12.2 36.9 25.0 #4 7.6 13.2 99.4 44.1 19.0 55.9 #8 3.4 6.4 85.5 35.8 8.3 64.2 #16 2.3 4.6 67.7 28.1 7.7 71.9

\*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.

Coars	eness Factor:	57	Workability Factor:	36	
Workability Factor (%)  00  00  00  00  00  00  00  00  00	45, 44 45, 33 Operating Zone	52, 41	Production Gradation 68, 38  60[38]  67. 40  68, 38  60[38]	JMF Zone 75, 39	
25 +	Boundary	50 5	5 Coarseness Factor (%)	75, 28	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

1.9

1.7

1.6

Batch Plant Gradations

Sample Date:

**Production Gradation** 

3/21/22 Concrete Grade: DM, 4500HP

Dates Test F	represents:	3/22/2022	through	3/28/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.4
26A	58-003	Stoneco	405	2.41	2.69	13.7
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9
		Total Wt	2055	17 71		100.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

38.3



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

l otal Wt		2955	17./1		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	26A		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"	90.0	10	0.0	100.0	95.3	4.7	4.7
1/2"	47.8	99	).9	100.0	75.3	20.0	24.7
3/8"	25.0	89	9.8	100.0	63.1	12.2	36.9
#4	7.6	13	3.2	99.4	44.1	19.0	55.9
#8	3.4	6	.4	85.5	35.8	8.3	64.2
#16	2.3	4	.6	67.7	28.1	7.7	71.9
#30	1.9	3	.8	48.8	20.4	7.7	79.6
#50	1.7	3.4		23.8	10.5	9.9	89.5
#100	1.6	3	.2	6.5	3.7	6.8	96.3
LBW	1.4	2	.9	2.0	1.8	1.9	98.2

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:	57	Workability Factor:	36	
45 45, 44			JMF Zone	
Morkability Factor (%) 35  Operating Zone Boundary	52, 34	■ Production Gradation 68, 38 ■ 60   8	75, 39	
Operating Zone Boundary  40  ActionLimits Boundary =	50 55	31, 48, 31	75, 28	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

PREPARED BY: SM, LLC Technical Service Approved BY:

## Aggregate Optimization Chart

3/21/22

3/22/2022

PLANT #: P-12

Sample Date:

Dates Test Represents:

Concrete Grade: DM, 4500HP

Contractor:

MDOT No.:

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	48.2
26A	71-47	Presque Isle	355	2.17	2.62	12.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

through

%	
Contribution	
48.2	
12.2	
39.6	



----- Verify this number is 100%

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

	i otai vvt	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"	99.3	100.0	100.0	99.7	0.3	0.3
3/4"	80.3	100.0	100.0	90.5	9.2	9.5
1/2"	31.4	97.6	100.0	66.6	23.9	33.4
3/8"	11.8	89.7	100.0	56.2	10.4	43.8
#4	1.6	29.7	97.0	42.8	13.4	57.2
#8	1.4	9.8	79.4	33.3	9.5	66.7
#16	1.2	3.9	63.2	26.1	7.2	73.9
#30	1.2	2.8	47.0	19.5	6.5	80.5
#50	1.1	2.5	26.2	11.2	8.3	88.8
#100	1.0	2.3	4.3	2.5	8.7	97.5
LBW	0.6	2.0	0.6	0.8	1.7	99.2

3/28/2022

\*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.

Coarseness Factor:	66	Workability Factor:	33	35.8	Coars	seness Factor
45				$\neg \top$	Worl	kability Factor
45, 44	52, 41		JMF Zone	]	Sieve	Cumulative % Passing
_ 40 -	57,	4068, 40		- 11	2"	100.0
		68, 38	75, 39	- 11	1.5"	100.0
35		!		- 11	1"	99.3
		■ 60, 36PS ■ Production Grad	ation		3/4"	89.0
35 -		i		- 11	1/2"	70.3
	52, 34	<u> </u>			3/8"	59.9
45, 33	- 17-	22			#4	41.9
30 -	0.,	68, 31 68, 31		- 11	#8	35.9
Operating Zone	7			- 11	#16	27.8
30 - 45, 33 Operating Zone Boundary			75, 28		#30	18.9
25					#50	6.3
40 45	50 55	60 65 70	75	80	#100	1.7
	<u> </u>	Coarseness Factor (%)	. 0	••	LBW	1.0

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

Presque Isle

Smelter Bay

**Total Wt** 

PLANT #: P-32

71-47

95-013

Sample Date:

Agg. Class 6AA 26A

2NS

LBW

**Coarseness Factor:** 

3/21/22 Concrete Grade: DM, 4500HP

1.53

6.95

17.69

2.62

2.65

1.9

35

8.6

39.6

100.0

1.9

37.8

Dates Test F	Represents:	3/22/2022	through	3/28/2022		
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

2.0

**Workability Factor:** 

250

1150

2905

Contractor:

MDOT No.:		



<---- Verify this number is 100%

 Cumulative

**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	ĺ
1"	98.2	100.0	100.0	99.1	0.9	0.9	
3/4"	75.0	100.0	100.0	87.0	12.0	13.0	
1/2"	34.9	97.6	100.0	66.1	21.0	33.9	
3/8"	19.6	89.7	100.0	57.5	8.6	42.5	*
#4	4.2	29.7	96.1	42.8	14.7	57.2	*
#8	2.8	9.8	83.4	35.3	7.5	64.7	no
#16	2.4	3.9	68.2	28.6	6.7	71.4	*
#30	2.3	2.8	48.9	20.8	7.8	79.2	no
#50	2.2	2.5	24.7	11.1	9.7	88.9	*
#100	21	2.3	7.8	44	6.8	95.6	a 1

\*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.

 Batch Plant Gradations Aggregate Supplier Gradations **Production Gradation** 

66

1.8

2.5 Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

**Workability Factor:** 

Workability Factor (%)	45   40   35   30   25	45, 44  45, 33  Operating Zone Boundary	52, 41 56	40 ¥ 60,		n Gradation	
Ac	40	45	50 55	Coarsene	ss Factor (%)	75	80

	<b>,</b>		
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

Sample Date:

**Production Gradation** 

3/21/22 Concrete Grade: DM, 4500HP

Dates Test Represents:		3/22/2022	through	3/28/2022			
	Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
	6AA	58-003	Stoneco	1450	8.64	2.69	49.1
	26A	58-003	Stoneco	405	2.41	2.69	13.7
	2NS	81-019	Pleasant Lake	1100	6.65	2.65	37.2

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.9

Contractor:



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

	l otal Wt	2955	17.70		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	<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"	90.0	100	0.0	100.0	95.1	4.9	4.9
1/2"	47.8	99	).9	100.0	74.4	20.7	25.6
3/8"	25.0	89	0.8	100.0	61.8	12.6	38.2
#4	7.6	13	3.2	99.4	42.5	19.3	57.5
#8	3.4	6.	.4	85.5	34.4	8.2	65.6
#16	2.3	4.	.6	67.7	27.0	7.4	73.0
#30	1.9	3.	.8	48.8	19.6	7.3	80.4
#50	1.7	3.	4	23.8	10.2	9.5	89.8
#100	1.6	3.	.2	6.5	3.6	6.5	96.4
LBW	1.4	2.	.9	2.0	1.8	1.8	98.2

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:	58	Workability Factor:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41 56, 52, 34	Froduction Gradation 68, 38 € 60, 18€	75, 28	
40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

Batch Plant Gradations

Work	ability Factor:	36	
Sieve	Sieve Cumulative % Passing		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

61

Grange Hall

0.6

**Total Wt** 

Batch Plant Gradations

PLANT #: P-36

63-92

Sample Date:

2NS

LBW

**Production Gradation** 

3/21/22 Concrete Grade: **DM**, **4500HP** 

6.65

17.69

2.65

0.7

Dates Test Represents:		3/22/2022	through	3/28/2022			
	Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
	6AA	71-47	Presque Isle	1400	8.56	2.62	48.2
	26A	71-47	Presque Isle	405	2.48	2.62	13.9

1100

2905

Contractor:

MDOT No.:

1.3

Adjusted WF Intial Production Sample (IPS)



100.0

0.8

36.7

SUPERIOR

<---- Verify this number is 100%

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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"	99.3	100.0	100.0	99.7	0.3	0.3
3/4"	80.3	100.0	100.0	90.5	9.2	9.5
1/2"	31.4	97.6	100.0	66.6	23.9	33.4
3/8"	11.8	89.7	100.0	56.1	10.5	43.9
#4	1.6	29.7	98.0	42.0	14.0	58.0
#8	1.4	9.8	84.8	34.2	7.9	65.8
#16	1.2	3.9	68.0	26.9	7.3	73.1
#30	1.2	2.8	48.8	19.4	7.4	80.6
#50	1.1	2.5	20.6	8.7	10.8	91.3
#100	1.0	2.3	3.6	2.2	6.5	97.8

Aggregate Supplier Gradations

2.0

\*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.

\*% 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		67	Workability Factor: 34	
45 —				_
	45, 44		JMF Zone	
1 1		52, 41		
(a) 40 -			<b>58, 39 68, 39</b> 75, 39	
§			68, 38	
Workability Factor (%)			■ 60, 36 Pbduction Gradation	
<b>E</b> 35	$\rightarrow$	52, 34	l	
<u>\</u>	45, 33			
<b>=</b> 30   _		1	58, 31 68, 31	
꽃	Operating Zone Boundary		75.00	
		J	75, 28	
25 +	45	50	55 60 65 70 75 8	<b>-</b> 30
			55 Coarseness Factor (%) 70 75 8	,0
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"	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

99.2

**Coarseness Factor:** 

PREPARED BY: SM, LLC Technical Service Approved By

Sample Date:

**Production Gradation** 

Concrete Grade: DM, 4500HP 3/21/22

3/28/2022

MDOT No.:	

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

34.9

Dates Test Represents:		3/22/2022	through	3/28/2022		
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

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	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"	98.8	10	0.0	100.0	99.4	0.6	0.6
3/4"	87.0	10	0.0	100.0	93.3	6.1	6.7
1/2"	44.4	96	6.5	100.0	70.8	22.4	29.2
3/8"	25.8	85	5.8	100.0	60.1	10.7	39.9
#4	5.0	16	5.2	97.4	41.1	18.9	58.9
#8	2.5	4	.1	81.0	32.4	8.8	67.6
#16	2.0	2	.6	65.3	26.0	6.3	74.0
#30	1.9	2	.2	48.2	19.5	6.6	80.5
#50	1.8	2	.0	22.6	9.7	9.8	90.3
#100	1.7	1	.9	6.0	3.3	6.3	96.7
LBW	1.6	1	.7	0.9	1.3	2.0	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:	59	Workability Factor:	32	
45 45, 44 40 45, 44 45, 33 45, 33 Operating Zone Boundary	52, 41	56, 40 68, 38 Production Gradation	75, 39	
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:

**Production Gradation** 

3/21/22 Concrete Grade: DM, 4500HP

3/22/2022 3/28/2022 through

Dates Test Represents:		3/22/2022	through	3/28/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	350	2.14	2.62	12.0
2NS	63-115	Ray Rd	1100	6.65	2.65	37.9
Total Wt			2905	17.69		100.0

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

34.4

Contractor:

---- Verify this number is 100%

SUPERIOR	
MATERIALS	

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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"	99.3	100.0	100.0	99.6	0.4	0.4
3/4"	80.3	100.0	100.0	90.1	9.5	9.9
1/2"	31.4	97.6	100.0	65.4	24.8	34.6
3/8"	11.8	89.7	100.0	54.6	10.8	45.4
#4	1.6	29.7	97.0	41.1	13.5	58.9
#8	1.4	9.8	79.4	31.9	9.2	68.1
#16	1.2	3.9	63.2	25.0	6.9	75.0
#30	1.2	2.8	47.0	18.7	6.3	81.3
#50	1.1	2.5	26.2	10.8	8.0	89.2
#100	1.0	2.3	4.3	2.4	8.4	97.6
LBW	0.6	2.0	0.6	0.8	1.6	99.2
Production C	Gradation O Batch Plant Grada	tions    Aggregate SupplierGrad	dations	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:	32	
45 45, 44			JMF Zone	$\overline{\mathbb{T}}$
(%)	52, 41	58, 39 68, 39 68, 38	75, 39	
Morkability Factor (%) 35  45, 33  Operating Zone Boundary	52, 34	■ 60, 36 IPS ■ Productio	n Gradati <b>o</b> n	
		58, 31 689,331	75, 28	
25 40 45  ActionLimits Boundary =	50 5	5 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"	95.1	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