Aggregate Optimization Chart

1/2/23

1/3/2023

Batch Plant Gradations

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

Production Gradation

Pit#

71-47

71-47

75-051

Production Gradation Report

PLANT #: P-101

Concrete Grade: DM, 4500HP

1/9/2023 through

	o a g	., 0, 2020		
Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
Presque Isle	1510	9.24	2.62	51.9
Presque Isle	250	1.53	2.62	8.6
Mid Michigan	1150	6.93	2.66	39.5
Total W/	2040	17.60		100.0

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	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"	98.4	100	0.0	100.0	99.2	0.8	0.8
3/4"	88.9	100	0.0	100.0	94.2	4.9	5.8
1/2"	48.0	96	.2	100.0	72.7	21.5	27.3
3/8"	28.9	87	.8	100.0	62.1	10.6	37.9
#4	4.4	21	.9	97.7	42.8	19.3	57.2
#8	1.8	4.:	3	81.3	33.4	9.3	66.6
#16	1.7	2.:	2	65.7	27.0	6.4	73.0
#30	1.6	1.5	9	49.4	20.5	6.5	79.5
#50	1.6	1.	8	26.5	11.5	9.1	88.5
#100	1.6	1.	7	8.2	4.2	7.2	95.8
LBW	1.4	1.	6	1.5	1.5	2.8	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:	57	Workability Factor:	33	35.9
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 Producti66, Gasation 67, 39 68, 38	75, 39	
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"	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

Pleasant Lake

Batch Plant Gradations

PLANT #: P-102

81-019

Sample Date:

2NS

Production Gradation

Concrete Grade: DM, 4500HP

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
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

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	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"	88.7	100.0	100.0	94.3	5.7	5.7
1/2"	43.9	99.5	100.0	71.4	22.8	28.6
3/8"	21.5	88.1	100.0	58.9	12.5	41.1
#4	6.3	17.2	97.4	42.9	16.0	57.1
#8	3.0	4.5	83.5	34.5	8.4	65.5 r
#16	2.4	2.7	67.0	27.6	6.9	72.4
#30	2.0	1.8	49.7	20.6	7.0	79.4 r
#50	1.7	1.7	24.2	10.5	10.1	89.5
#100	1.6	1.6	6.9	3.7	6.8	96.3 a
LBW	1.4	1.4	1.8	1.6	2.1	98.4

Aggregate Supplier Gradations

2.65

39.0

37.0

*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:	63	Workability Factor:	35	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Production Gradation 60,138	JMF Zone 75, 39	
Boundary 25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75, 28 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

Sample Date:

LBW

Production Gradation

1/2/23 Concrete Grade: DM, 4500HP

Dates Test Represents: 1/3/2023 1/9/2023 through

Contractor:	

Coarseness Factor:

MDOT No.:

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%

SUPER	RIOR

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	ı
1"	100.0	100.0	100.0	100.0	0.0	0.0	i
3/4"	88.7	100.0	100.0	94.3	5.7	5.7	i
1/2"	43.9	99.5	100.0	71.4	22.8	28.6	1
3/8"	21.5	88.1	100.0	58.9	12.5	41.1	1
#4	6.3	17.2	97.4	42.9	16.0	57.1	1
#8	3.0	4.5	83.5	34.5	8.4	65.5	n
#16	2.4	2.7	67.0	27.6	6.9	72.4	1
#30	2.0	1.8	49.7	20.6	7.0	79.4	n
#50	1.7	1.7	24.2	10.5	10.1	89.5	1
#100	1.6	1.6	6.9	3.7	6.8	96.3	а

Aggregate Supplier Gradations

1.6

Adjusted WF Intial Production 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:	63	Workability Factor:	35	37.0
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Production Gradation 60J26	75, 39	
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"	89.2	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

O Batch Plant Gradations

Approved BY:

Sample Date:

Production Gradation

1/2/23 1/9/2023

Concrete Grade: DM, 4500HP

Contractor:

Adjusted WF Intial Production Sample (IPS)

38.0

Coarseness Factor:

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1530	9.11	2.69	51.7
26A	58-003	Stoneco	330	1.97	2.69	11.1
2NS	19-55	Schlegel	1100	6.60	2.67	37.2
		Total Wt	2960	17.68		100.0

- Verify this number is 100%

Builders Redi-Mix

30701 W. 10 Mile Rd. Suite 500

Farmington Hills, MI 48336

	TOTAL AND	2900 17.0	0	100.0	< verity 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"	88.7	100.0	100.0	94.2	5.8	5.8
1/2"	43.9	99.5	100.0	70.9	23.2	29.1
3/8"	21.5	88.1	100.0	58.1	12.8	41.9
#4	6.3	17.2	99.9	42.3	15.8	57.7
#8	3.0	4.5	90.1	35.5	6.8	64.5
#16	2.4	2.7	69.4	27.3	8.2	72.7
#30	2.0	1.8	44.5	17.8	9.6	82.2
#50	1.7	1.7	14.3	6.4	11.4	93.6
#100	1.6	1.6	2.7	2.0	4.4	98.0
LBW	1.4	1.4	0.2	1.0	1.1	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:	65	Workability Factor:	36	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	68, 38 Production Gra 60, 38PS 68, 37	JMF Zone 75, 39	
25 +		55 00 05 70	75, 28	
40 45 ActionLimits Boundary =	50	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"	89.0	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

63

Sample Date:

#100

LBW

1/2/23 1/9/2023

Concrete Grade: DM, 4500HP

3.0

1.2

4.9

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
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	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2005	17 60		100.0

MDOT No.:

97.0

98.8

---- Verify this number is 100%

Contractor:

8.4

1.9

SUPERIOR MATERIALS	

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"	96.3	100.0	100.0	98.3	1.7	1.7
3/4"	77.7	100.0	100.0	89.6	8.7	10.4
1/2"	28.7	97.7	100.0	66.4	23.2	33.6
3/8"	11.9	87.2	100.0	57.1	9.3	42.9
#4	2.6	15.8	96.7	41.7	15.5	58.3
#8	2.3	3.8	80.0	33.3	8.4	66.7
#16	2.1	1.8	65.1	27.0	6.3	73.0
#30	2.1	1.6	49.7	20.9	6.1	79.1
#50	2.0	1.4	25.9	11.4	9.5	88.6

1.3

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.

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

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

Production Gradation	ns Aggregate Supplier Gradations	Adjusted WF	Intial Producti	ion Sample (IPS	(
Coarseness Factor: 64	Workability Factor: 33	35.8	Coars	seness Factor:	
7 45		$\neg \top$	Work	cability Factor:	
45, 44	JMF Zone	$\neg \sqcap$	Sieve	Cumulative	
52, 41			Sieve	% Passing	
40 -		- 11	2"	100.0	
	68, 38 • 60, 36PS Production Gradation	- 11	1.5"	100.0	
		- 11	1"	99.3	
£		- 11	3/4"	89.0	
Factor (%)		- 11	1/2"	70.3	
	<u> </u>	- 11	3/8"	59.9	
Ability 30 45, 33 57, 22 68, 32			#4	41.9	
30 -	68, 32	- 11	#8	35.9	
Operating Zone		- 11	#16	27.8	
Boundary	75, 28	- 11	#30	18.9	
25			#50	6.3	
	60 65 70 75	80	#100	1.7	
	Coarseness Factor (%)		LBW	1.0	
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"	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

1.9

1.5

Aggregate Optimization Chart

PLANT #: 11

Sample Date:

1/2/23

Contractor:

Concrete Grade: DM, 4500HP

Dates Test Represents:		1/3/2023	through	1/9/2023		
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

MDOT No.:

Coarseness Factor:

_		
SUF		

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	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"	99.1	10	0.0	100.0	99.5	0.5	0.5
3/4"	75.8	10	0.0	100.0	87.0	12.5	13.0
1/2"	39.3	97	7.7	100.0	67.3	19.7	32.7
3/8"	22.0	87	7.2	100.0	57.4	10.0	42.6
#4	3.5	15	5.8	95.9	40.9	16.4	59.1
#8	1.9	3	.8	83.9	34.5	6.4	65.5
#16	1.7	1	.8	68.8	28.3	6.2	71.7
#30	1.6	1	.6	49.9	20.7	7.5	79.3
#50	1.6	1	.4	24.5	10.7	10.1	89.3
#100	1.5	1	.3	7.0	3.7	7.0	96.3
LBW	1.2	1	.0	1.4	1.3	2.4	98.7
	Datab Dlant Crada	tions Ag	gragata Supplier Ci	adations		1	

O Batch Plant Gradations Aggregate Supplier Gradations **Production Gradation** Adjusted WF Intial Production Sample (IPS) **Coarseness Factor:** Workability Factor: 34 37.0 65 JMF Zone 75. 39 Workability Factor (%) ction Gradation 52, 34 Operating Zone 75, 28 Boundary 45 50 Coarseness Factor (%) 70 75 80 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"	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:

Concrete Grade: DM, 4500HP 1/2/23

37.0

MDOT	No.:	

Contractor:

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
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

Coarseness Factor:

SUPERIO	OR

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

	i otai vyt	2905	17.69		100.0	< Verify this n	lumber is 100%
Sieve	6AA	26	4	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"	99.1	100	.0	100.0	99.5	0.5	0.5
3/4"	75.8	100	.0	100.0	87.0	12.5	13.0
1/2"	39.3	97.	7	100.0	67.3	19.7	32.7
3/8"	22.0	87.	2	100.0	57.4	10.0	42.6
#4	3.5	15.	8	95.9	40.9	16.4	59.1
#8	1.9	3.8	3	83.9	34.5	6.4	65.5
#16	1.7	1.8	3	68.8	28.3	6.2	71.7
#30	1.6	1.6	3	49.9	20.7	7.5	79.3
#50	1.6	1.4	1	24.5	10.7	10.1	89.3
#100	1.5	1.3	3	7.0	3.7	7.0	96.3
LBW	1.2	1.0)	1.4	1.3	2.4	98.7

*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.

Coarse	ness Factor:	65	Workability Factor:	34	
Workability Factor (%) 28 29 30 30 40 41 42 43 44 45 46 46 46 46 47 48 48 48 48 48 48 48 48 48	45, 44 45, 33 Operating Zone Boundary	52, 34	6, 40 67, 40 68, 38 Production Grade 60, 38S 60, 38	75, 28	
25 + 40	45 ts Boundary =	50 5	5 Coarseness Factor (%) ⁷⁰	75	# 80

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

Sample Date:

Production Gradation

1/2/23

Concrete Grade: DM, 4500HP

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

37.0

Contractor:

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
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

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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"	88.7	100.0	100.0	94.3	5.7	5.7	
1/2"	43.9	99.5	100.0	71.4	22.8	28.6	
3/8"	21.5	88.1	100.0	58.9	12.5	41.1	*
#4	6.3	17.2	97.4	42.9	16.0	57.1	*,
#8	3.0	4.5	83.5	34.5	8.4	65.5	no
#16	2.4	2.7	67.0	27.6	6.9	72.4	*(
#30	2.0	1.8	49.7	20.6	7.0	79.4	no
#50	1.7	1.7	24.2	10.5	10.1	89.5	*(
#100	1.6	1.6	6.9	3.7	6.8	96.3	a 2
LBW	1.4	1.4	1.8	1.6	2.1	98.4	

Aggregate Supplier Gradations

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

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

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

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

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

61

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

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

45 45, 44 JMF Zone 40 45, 44 550, 49 68, 38 Production Gradation 60, 36 75, 39 Football mits Boundary Action limits Boundary 5 75, 28 Coarseness Factor (%)	Coarseness Factor:	63	Workability Factor:	35	
25 40 45 50 55 60 65 70 75 80 Coarseness Factor (%)	45 45, 44	52, 41	Production Gradation	JMF Zone	
Victorialistis positività -	25	50 55 			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:

Production Gradation

Concrete Grade: DM, 4500HP 1/2/23

1/9/2023 through

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1350	8.26	2.62	46.5
26A	71-47	Presque Isle	455	2.78	2.62	15.7
2NS	63-92	Grange Hall	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:

36.2



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	Total 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"	96.3	100	0.0	100.0	98.3	1.7	1.7
3/4"	77.7	100	0.0	100.0	89.6	8.6	10.4
1/2"	28.7	97	.7	100.0	66.5	23.1	33.5
3/8"	11.9	87	.2	100.0	57.1	9.5	42.9
#4	2.6	15	.8	97.8	40.7	16.3	59.3
#8	2.3	3.	8	84.7	33.7	7.0	66.3
#16	2.1	1.	8	71.1	28.2	5.6	71.8
#30	2.1	1.	6	52.9	21.3	6.9	78.7
#50	2.0	1.	4	24.5	10.4	10.8	89.6
#100	1.9	1.	3	3.6	2.4	8.0	97.6
LBW	1.5	1.	0	0.5	1.0	1.4	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 Fa	ctor: 65	Workability Factor:	34	
45 45, 44 (%) 45, 44 Operating Boun	52, 41 52, 34	58, 39 68, 38 68, 38 Froduction Gradate 198 68, 31 68, 31	75, 39	
25 +	5 50 5	5 Coarseness Factor (%)	75	80

Batch Plant Gradations

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

through

Weight (SSD)

1605

200

1100

1/3/2023

Source

Presque Isle

Presque Isle

Krake Willis Rd

PLANT #: P-39

Pit#

71-47

71-47

44-051

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

1/2/23 Concrete Grade: DM, 4500HP 1/9/2023

ft³

9.82

1.22

6.65

2.62

2.65

		. 1
Specific	%	Ì
Gravity	Contribution	
Gravity	Continuation	

6.9

37.9

34.2

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:



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Suite 500	

Farmington Hills, MI 48336

	Total 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"	98.4	10	100.0		99.1	0.9	0.9
3/4"	88.9	10	100.0		93.9	5.2	6.1
1/2"	48.0	96.2		100.0	71.0	22.9	29.0
3/8"	28.9	87	7.8	100.0	59.9	11.1	40.1
#4	4.4	21	1.9	96.2	40.4	19.5	59.6
#8	1.8	4	.3	80.4	31.7	8.6	68.3
#16	1.7	2	.2	65.2	25.8	6.0	74.2
#30	1.6	1	.9	49.4	19.7	6.1	80.3
#50	1.6	1	1.8		10.2	9.5	89.8
#100	1.6	1	.7	9.0	4.4	5.8	95.6
LBW	1.4	1	.6	0.8	1.2	3.2	98.8
Production G	Gradation Batch Plant Grad	ations	gregate Supplier Gr	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:	59	Workability Factor:	32	
45 45, 44	52, 41	58, 38	JMF Zone 75, 39	
Workability Factor (%) 35 45, 33 Operating Zone Boundary	52, 34	■ 60, 36 IPS ■ Production Gradation 58,32		
25			75, 28	
40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%) ⁷⁰	75	80

Workability Factor:		36	
Sieve	Cumulative	%	Cumulative
	% 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:

1/2/23 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	1/3/2023	through	1/9/2023		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific	%
Agg. Class	111.77	Source	Weight (33D)	(SSD) II	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	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

MDOT No.:

Contractor:

Coarseness Factor:

35.8

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

	Ťotal 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"	96.3	10	0.0	100.0	98.3	1.7	1.7
3/4"	77.7	10	0.0	100.0	89.6	8.7	10.4
1/2"	28.7	97	7.7	100.0	66.4	23.2	33.6
3/8"	11.9	87	7.2	100.0	57.1	9.3	42.9
#4	2.6	15	5.8	96.7	41.7	15.5	58.3
#8	2.3	3	.8	80.0	33.3	8.4	66.7
#16	2.1	1	.8	65.1	27.0	6.3	73.0
#30	2.1	1	.6	49.7	20.9	6.1	79.1
#50	2.0	1	.4	25.9	11.4	9.5	88.6
#100	1.9	1	.3	4.9	3.0	8.4	97.0
LBW	1.5	1	.0	0.8	1.2	1.9	98.8
Production G	Gradation O Batch Plant Grad	ations	regate SupplierGra	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:	64	Workability Factor:	33	
45 45, 44 40 45, 44 45, 33 45, 33 Operating Zone Boundary	52, 41	58, 39 68, 39 68, 39 68, 38 68	JMF Zone 75, 39 dation 75, 28	
40 45 ActionLimits Boundary =	50 5	Coarseness Factor (%)	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"	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

63