Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-101 Contractor:

Concrete Grade: DM, 4500HP Sample Date: 10/24/22 Dates Test Represents: 10/25/2022 10/31/2022 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.:

-- Verify this number is 100%

Coarseness Factor:

SUPERIOR	

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

	i otai vvt	2910 17.09		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"	98.5	100.0	100.0	99.2	0.8	0.8	
3/4"	81.6	100.0	100.0	90.8	8.5	9.2	
1/2"	40.2	93.5	100.0	69.3	21.4	30.7	
3/8"	21.4	76.8	100.0	58.2	11.2	41.8	*1
#4	2.9	20.3	98.7	42.6	15.6	57.4	*/
#8	1.7	7.5	83.9	34.8	7.8	65.2	noi
#16	1.5	4.3	68.1	28.1	6.7	71.9	*0
#30	1.5	3.3	49.6	20.7	7.4	79.3	noi
#50	1.4	3.0	22.0	9.7	11.0	90.3	*0
#100	1.4	2.8	5.1	3.0	6.7	97.0	a 2
LBW	1.2	2.4	0.7	1.1	1.9	98.9	
Production Gra	adation O Batch Plant Grada	tions Aggregate Supplier Gr	radations	Adjusted WF	Initial Producti	on Sample (IPS	S)

*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:	35	37.3
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 Production Grada 60, 36s	JMF Zone 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"	1" 100.0		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

Sample Date:

Concrete Grade: DM, 4500HP 10/24/22

10/31/2022 through

MDOT No.:	

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.4

Dates Test F	Represents:	10/25/2022	through	10/31/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2950	17.68		100.0

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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	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"	99.8	10	0.0	100.0	99.9	0.1	0.1
3/4"	82.9	10	0.0	100.0	91.0	8.9	9.0
1/2"	44.3	99	9.6	100.0	70.7	20.3	29.3
3/8"	21.6	84	ł.5	100.0	57.5	13.2	42.5
#4	3.8	14	l.9	98.3	41.6	15.9	58.4
#8	1.6	5.	.2	83.7	33.9	7.7	66.1
#16	1.3	3	.3	66.4	26.8	7.1	73.2
#30	1.2	2	.6	46.4	18.9	7.9	81.1
#50	1.0	2	.4	21.6	9.1	9.8	90.9
#100	1.0	2	.3	6.4	3.2	5.9	96.8
LBW	0.8	2.	.0	1.7	1.3	2.0	98.7
Production Grad	dation O Batch Plant Grada	tions (Agg	regate Supplier Gra	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:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 60, 32 Production Gradation	75, 39 75, 28	
40 45 ActionLimits Boundary =	50	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

61

Sample Date:

10/24/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	10/25/2022	through	10/31/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
2NS	81-019	Pleasant Lake		6.95	2.65	39.0
		T - (- 1 M/c	2	47.00		4000

Contractor:

MDOT No.:



SUPE	

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		2950 17.68			100.0	< Verify this number 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"	99.8	10	0.0	100.0	99.9	0.1	0.1
3/4"	82.9	10	0.0	100.0	91.0	8.9	9.0
1/2"	44.3	99	9.6	100.0	70.7	20.3	29.3
3/8"	21.6	84	l.5	100.0	57.5	13.2	42.5
#4	3.8	14	1.9	98.3	41.6	15.9	58.4
#8	1.6	5	.2	83.7	33.9	7.7	66.1
#16	1.3	3	.3	66.4	26.8	7.1	73.2
#30	1.2	2	.6	46.4	18.9	7.9	81.1
#50	1.0	2.4		21.6	9.1	9.8	90.9
#100	1.0	2	.3	6.4	3.2	5.9	96.8
LBW	0.8	2	.0	1.7	1.3	2.0	98.7

■ 60188 ■ Profluction Gradation

Coarseness Factor (%)⁷⁰

75, 28

80

75

Aggregate Supplier Gradations O Batch Plant Gradations **Production Gradation** Adjusted WF Intial Production Sample (IPS) **Coarseness Factor:** 64 **Workability Factor:** 34 36.4 45 JMF Zone 45, 44 Workability Factor (%)

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

Coarseness Factor:

PREPARED BY: SM, LLC Technical Service

Operating Zone Boundary

45

ActionLimits Boundary = - - - -

25

52, 34

50

55

Approved BY:

Schlegel

Batch Plant Gradations

PLANT #: P-14

19-55

Sample Date:

2NS

Production Gradation

10/24/22 Concrete Grade: DM, 4500HP

6.60

17 60

2.67

37.2

37.5

Dates Test Represents:		10/25/2022	through	10/31/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.4
26A	58-003	Stoneco	310	1.85	2.69	10.5

1100

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

Contractor:

MDOT No.:



Builders Redi-Mix 30701 W. 10 Mile Rd. Suite 500

Farmington Hills, MI 48336

	i otai 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	l
1.5"	100.0	100	0.0	100.0	100.0	0.0	0.0	l
1"	99.8	100	0.0	100.0	99.9	0.1	0.1	l
3/4"	82.9	100	0.0	100.0	91.0	8.8	9.0	l
1/2"	44.3	99	.6	100.0	70.8	20.3	29.2	l
3/8"	21.6	84	.5	100.0	57.3	13.5	42.7	l
#4	3.8	14	.9	99.9	40.7	16.6	59.3	l
#8	1.6	5.	2	90.4	35.0	5.7	65.0	n
#16	1.3	3.	3	71.5	27.6	7.4	72.4	l
#30	1.2	2.	6	50.7	19.7	7.9	80.3	n
#50	1.0	2.	4	17.4	7.2	12.5	92.8	l
#100	1.0	2.	3	3.2	2.0	5.3	98.0	а
LBW	0.8	2.	0	0.4	0.8	1.2	99.2	l

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	eness Factor:	66	Workability Factor:	35	
45]	45, 44			JMF Zone	$\overline{\mathbb{n}}$
Factor (%)		52, 41	57, 40 68, 40 68, 38 Profuction 0	75, 39 Gradation	
Workability Factor (%)	45, 33 Operating Zone Boundary	52, 34	57, 22 68, 32	75, 28	
25 -4 ActionLin	0 45	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

10/24/22

PLANT #: P-12

Sample Date:

Concrete Grade: DM, 4500HP

Contractor:

Dates Test Represents: 10/25/2022 10/31/2022 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 250 1.53 2.62 8.6 2NS 63-115 Ray Rd 1150 6.95 2.65 39.6

MDOT No.:

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 2905 17.69			100.0	< Verify this number is 100%		
Sieve		6AA	26	i 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"		97.0	100	0.0	100.0	98.4	1.6	1.6
3/4"		81.3	100	0.0	100.0	90.3	8.1	9.7
1/2"		37.2	99).4	100.0	67.4	22.9	32.6
3/8"		17.2	88	3.4	100.0	56.1	11.3	43.9
#4		3.3	22	2.6	96.7	41.9	14.2	58.1
#8		1.7	5.	.3	78.0	32.2	9.7	67.8
#16		1.5	2.	4	60.8	25.1	7.2	74.9
#30		1.4	1.	9	46.3	19.2	5.8	80.8
#50		1.4	1.	.7	26.3	11.3	7.9	88.7
#100		1.3	1.	6	6.2	3.3	8.0	96.7
LBW		1.1	1.	.4	0.7	1.0	2.3	99.0

Production Gradation Adjusted WF Intial Production Sample (IPS) Coarseness Factor: 65 **Workability Factor:** 32 34.7 45, 44 JMF Zone 75. 39 Workability Factor (%) ■ 60, 36PS Production Gradation 52, 34 Operating Zone 75, 28 Boundary 45 50 Coarseness Factor (%) 70 75 80 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

Coarseness Factor:

Approved By:

PLANT #:

Sample Date:

Dates Test Represents:

Concrete Grade: DM, 4500HP 10/24/22

10/25/2022	through	10/31/2022		
Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
Presque Isle	1555	9.51	2.62	53.5

Contractor:

MDOT No.:

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



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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"	98.3	100	0.0	100.0	99.1	0.9	0.9
3/4"	82.1	100	0.0	100.0	90.4	8.7	9.6
1/2"	38.4	99).4	100.0	67.0	23.4	33.0
3/8"	20.6	88	3.4	100.0	56.7	10.3	43.3
#4	3.5	22	2.6	95.6	41.3	15.4	58.7
#8	2.2	5.	.3	83.5	34.6	6.7	65.4
#16	1.9	2.	.4	68.6	28.3	6.3	71.7
#30	1.9	1.	.9	50.0	20.9	7.4	79.1
#50	1.8	1.	.7	24.7	10.9	10.1	89.1
#100	1.7	1.	.6	7.4	3.9	6.9	96.1
LBW	1.3	1.	.4	1.2	1.3	2.7	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.

*% 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 Batch Plant Gra	dations	ions	Adjusted WF	Intial Producti	on Sample (IPS)
Coarseness Factor:	66	Workability Factor:	35	37.1	Coars	eness Factor:
7 45				$\neg $	Work	ability Factor:
45, 44			JMF Zone	7 I I	Sieve	Cumulative
-	52, 41		3 20.10		Sieve	% Passing
40	54	67, 40			2"	100.0
		68, 38	75, 39		1.5"	100.0
		Production Gr	adation	- 11	1"	100.0
유		■ 60, 3 B S			3/4"	95.0
35 d		i			1/2"	72.3
	52, 34	! !			3/8"	60.4
Applied 30 - 45, 33 Operating Zone Boundary	50	92 97 32			#4	42.6
💆 30 -		67 , 32		- 11	#8	36.0
Operating Zone					#16	29.5
Boundary			75, 28		#30	20.3
25					#50	9.5
40 45	50 55	60 65 70	75	80	#100	3.4
		Coarseness Factor (%) ⁷⁰	. 3		LBW	1.3
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:

Dates Test Represents:

Production Gradation

10/24/22

Batch Plant Gradations

Contractor:

Concrete Grade: DM, 4500HP

10/23/2022	trirougn	10/31/2022		
Source	Weight (SSD)	ft ³	Specific	%
Oource	Weight (33b)	1.	Gravity	Contribution
Presque Isle	1555	9.51	2.62	53.5
Presque Isle	200	1.22	2.62	6.9

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

37.1

Agg. Class Pit# 6AA 71-47 26A 71-47 2NS 95-013 Smelter Bay 1150 2.65 39.6 Total Wt 2905 17.69

<---- Verify this number is 100%

SUPERIOR	R
MATERIAL	s

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

Farmington Hills, MI 48336

Total W		2303		100.0	C Verily tills if	umber 13 10070
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"	82.1	100.0	100.0	90.4	8.7	9.6
1/2"	38.4	99.4	100.0	67.0	23.4	33.0
3/8"	20.6	88.4	100.0	56.7	10.3	43.3
#4	3.5	22.6	95.6	41.3	15.4	58.7
#8	2.2	5.3	83.5	34.6	6.7	65.4
#16	1.9	2.4	68.6	28.3	6.3	71.7
#30	1.9	1.9	50.0	20.9	7.4	79.1
#50	1.8	1.7	24.7	10.9	10.1	89.1
#100	1.7	1.6	7.4	3.9	6.9	96.1
LBW	1.3	1.4	1.2	1.3	2.7	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.

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:	35	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	66, 40 68, 38 60, 38S 760, 38S	JMF Zone 75, 39 Gradation 75, 28	
40 45 ActionLimits Boundary =	50 5	⁵ Coarseness Factor (%) ⁷⁰	75	80

Work	ability Factor:	36	
Sieve	Cumulative	%	Cumulative
0.010	% 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

10/24/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	10/25/2022	through	10/31/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
004	000	Ċ	0.0	4 40	0.00	٥.



Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.4

SI	UPE	RI	OR

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6AA	26	SA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
100.0	100	0.0	100.0	100.0	0.0	0.0
100.0	100	0.0	100.0	100.0	0.0	0.0
99.8	100	0.0	100.0	99.9	0.1	0.1
82.9	100	0.0	100.0	91.0	8.9	9.0
44.3	99	0.6	100.0	70.7	20.3	29.3
21.6	84	.5	100.0	57.5	13.2	42.5
3.8	14	.9	98.3	41.6	15.9	58.4
1.6	5.	.2	83.7	33.9	7.7	66.1
1.3	3.	.3	66.4	26.8	7.1	73.2
1.2	2.	.6	46.4	18.9	7.9	81.1
1.0	2.	4	21.6	9.1	9.8	90.9
1.0	2.	3	6.4	3.2	5.9	96.8
0.8	2.	.0	1.7	1.3	2.0	98.7
	100.0 100.0 99.8 82.9 44.3 21.6 3.8 1.6 1.3 1.2	100.0 100 100.0 100 99.8 100 82.9 100 44.3 99 21.6 84 3.8 14 1.6 5. 1.3 3. 1.2 2. 1.0 2.	100.0 100.0 100.0 100.0 99.8 100.0 82.9 100.0 44.3 99.6 21.6 84.5 3.8 14.9 1.6 5.2 1.3 3.3 1.2 2.6 1.0 2.4 1.0 2.3	100.0 100.0 100.0 100.0 100.0 100.0 99.8 100.0 100.0 82.9 100.0 100.0 44.3 99.6 100.0 21.6 84.5 100.0 3.8 14.9 98.3 1.6 5.2 83.7 1.3 3.3 66.4 1.2 2.6 46.4 1.0 2.4 21.6 1.0 2.3 6.4	6AA 26A 2NS % Passing 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 99.8 100.0 100.0 99.9 82.9 100.0 100.0 91.0 44.3 99.6 100.0 70.7 21.6 84.5 100.0 57.5 3.8 14.9 98.3 41.6 1.6 5.2 83.7 33.9 1.3 3.3 66.4 26.8 1.2 2.6 46.4 18.9 1.0 2.4 21.6 9.1 1.0 2.3 6.4 3.2	6AA 26A 2NS % Passing % Retained 100.0 100.0 100.0 100.0 0.0 100.0 100.0 100.0 100.0 0.0 99.8 100.0 100.0 99.9 0.1 82.9 100.0 100.0 91.0 8.9 44.3 99.6 100.0 70.7 20.3 21.6 84.5 100.0 57.5 13.2 3.8 14.9 98.3 41.6 15.9 1.6 5.2 83.7 33.9 7.7 1.3 3.3 66.4 26.8 7.1 1.2 2.6 46.4 18.9 7.9 1.0 2.4 21.6 9.1 9.8 1.0 2.3 6.4 3.2 5.9

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:	34	
45 45, 44 45, 33 45, 33	52, 41	56, 40 87, 40 68, 38	JMF Zone 75, 39	
Operating Zone Boundary 25 40 45	50	55 60 65 70 Coarseness Factor (%)	75, 28 75	80
ActionLimits Boundary =		Coarseness Factor (%)		

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

Sample Date:

Production Gradation

10/24/22 Concrete Grade: DM, 4500HP

10/25/2022 10/31/2022

Dates Test F	Represents:	10/25/2022	through	10/31/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6
26A	71-47	Presque Isle	305	1.87	2.62	10.5
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:

35.6



--- Verify this number is 100%

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Suite 500
Farmington Hills, MI 48336

	Total Wt	2303 17.03		100.0	C Verily tills if	ulliber is 10076
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"	97.0	100.0	100.0	98.5	1.5	1.5
3/4"	81.3	100.0	100.0	90.3	8.1	9.7
1/2"	37.2	99.4	100.0	67.5	22.8	32.5
3/8"	17.2	88.4	100.0	56.0	11.5	44.0
#4	3.3	22.6	97.5	41.0	15.0	59.0
#8	1.7	5.3	83.7	33.1	7.9	66.9
#16	1.5	2.4	69.0	27.2	6.0	72.8
#30	1.4	1.9	49.1	19.5	7.6	80.5
#50	1.4	1.7	20.0	8.5	11.0	91.5
#100	1.3	1.6	3.6	2.2	6.3	97.8
LBW	1.1	1.4	0.9	1.1	1.1	98.9

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:	33	
45 45, 44 45, 44 45, 33 Operating Zon Boundary	52, 41 52, 34	58, 39 68, 38 68, 38 Production 68, 34 68, 3		
25 40 45 ActionLimits Boundary =	50	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

63

Krake Willis Rd

Batch Plant Gradations

PLANT #: P-39

44-051

Sample Date:

2NS

Production Gradation

10/24/22 Concrete Grade: DM, 4500HP

6.65

2.65

37.9

33.2

Dates Test Represents: 10/25/2022 10/31/2022 through Specific % ft³ Agg. Class Pit# Source Weight (SSD) Gravity Contribution 6AA 71-47 Presque Isle 1605 9.82 55.2 2.62 26A 71-47 Presque Isle 200 1.22 2.62 6.9

1100

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

Contractor:



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•	Total Wi	Wt 2905 17.69 100.0 < V		< Verify this n	umber is 100%		
Sieve	6AA	26	SA.	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"	98.5	10	100.0		99.2	0.8	0.8
3/4"	81.6	10	100.0		89.8	9.3	10.2
1/2"	40.2	93	93.5		66.5	23.3	33.5
3/8"	21.4	76	76.8		55.0	11.5	45.0
#4	2.9	20	20.3		39.3	15.7	60.7
#8	1.7	7	.5	77.2	30.7	8.6	69.3 r
#16	1.5	4	.3	61.8	24.5	6.2	75.5
#30	1.5	3	.3	47.0	18.9	5.7	81.1 r
#50	1.4	3	3.0		10.7	8.1	89.3
#100	1.4	2	.8	8.0	4.0	6.8	96.0 a
LBW	1.2	2	.4	1.0	1.2	2.8	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:	65	Workability Factor:	31	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 40 68, 38 68, 38 Production Gra		
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"	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

63

Sample Date:

Production Gradation

10/24/22 Concrete Grade: DM, 4500HP

10/25/2022 10/31/2022 through

Dates Test F	Represents:	10/25/2022	through	10/31/2022		
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

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

34.7

---- Verify this number is 100%

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

							u
Sieve	6AA	26	A	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"	97.0	100	.0	100.0	98.4	1.6	1.6
3/4"	81.3	100	.0	100.0	90.3	8.1	9.7
1/2"	37.2	99.	4	100.0	67.4	22.9	32.6
3/8"	17.2	88.	4	100.0	56.1	11.3	43.9
#4	3.3	22.	6	96.7	41.9	14.2	58.1
#8	1.7	5.3	3	78.0	32.2	9.7	67.8
#16	1.5	2.4		60.8	25.1	7.2	74.9
#30	1.4	1.9)	46.3	19.2	5.8	80.8
#50	1.4	1.7	,	26.3	11.3	7.9	88.7
#100	1.3	1.6	3	6.2	3.3	8.0	96.7
LBW	1.1	1.4		0.7	1.0	2.3	99.0

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:	65	Workability Factor:	32	
45 45, 44	52, 41		JMF Zone	
(%) 40 1	32, 4	58, 39 68, 39 68, 38 68, 38	75, 39	
Morkabillity Factor (%) 35 - 45, 33 Operating Zone Boundary	52, 34	Production Gradati	on	
Operating Zone Boundary	<u> </u>		75, 28	
40 45 ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

Batch Plant Gradations

Work	ability Factor:	35		
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"	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	#100 2.4		97.6	
LBW	0.9	1.5	99.1	