Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-101 Contractor:

Concrete Grade: DM, 4500HP Sample Date: 5/30/22 Dates Test Represents: 5/31/2022 6/6/2022 through

				0, 0, 0 0		
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%

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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"	98.2	100.0	100.0	99.1	0.9	0.9
3/4"	83.3	100.0	100.0	91.6	7.5	8.4
1/2"	46.0	96.2	100.0	72.5	19.1	27.5
3/8"	27.8	85.3	100.0	62.3	10.3	37.7
#4	4.4	23.5	98.8	43.7	18.6	56.3
#8	1.9	7.3	85.0	35.3	8.4	64.7 r
#16	1.6	3.4	70.4	29.0	6.3	71.0
#30	1.5	2.5	53.3	22.1	6.9	77.9 r
#50	1.5	2.3	25.5	11.1	11.0	88.9
#100	1.4	2.1	6.4	3.4	7.6	96.6
LBW	1.3	1.9	0.6	1.1	2.4	98.9
Production Gradati	on Batch Plant Gradati	ons	dations	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.

Production Gradation	Batch Plant Gra	dations Aggregate Supplier Gradat	tions	Adjusted WF	Initial Produc	tion Sample (IPS	3)
Coarseness Factor:	58	Workability Factor:	35	37.8	Coars	seness Factor:	
45					Worl	kability Factor:	
45, 44			JMF Zone	$\neg \mid \parallel$	Sieve	Cumulative	П
	50.44			_	Oicvc	% Passing	F
101	52, 41			- 11	2"	100.0	
(a) 40 d		57, 39 68, 38	75, 39	- 11	1.5"	100.0	
°		Production Gradation		- 11	1"	100.0	
		■ 60, 36 _S		- 11	3/4"	95.0	
Factor (%)	1	95, APS		- 11	1/2"	70.5	
1 / -	52, 34			- 11	3/8"	60.0	П
45, 33				- 11	#4	44.4	П
Operating Zone Boundary		57, 31 67 ₆ 3,1 ₃₁		- 11	#8	35.5	Г
Operating Zone				- 11	#16	28.5	
Boundary			75, 28	- 11	#30	21.5	П
≥ 25					#50	10.2	
40 45	50 5	55 60 65 70	75	80	#100	3.1	
		Coarseness Factor (%)	70	~~ [LBW	1.3	П
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"	95.0	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

PREPARED BY: SM, LLC Technical Service

Sample Date:

Dates Test Represents:

Production Gradation

Concrete Grade: DM, 4500HP 5/30/22

5/31/2022	through	6/6/2022		
Source	Weight (ccn)	ft ³	Specific	%
Source	Weight (SSD)	π	Gravity	Contribution
Stoneco	1480	8.82	2.69	50.2

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.4

Contractor:

MDOT No.:

Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1480	8.82	2.69	50.2
26A	58-003	Stoneco	320	1.91	2.69	10.8
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2950	17.68		100.0

SUPE	RIOR

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	i otai Wt	2950	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	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"	78.3	100	.0	100.0	89.1	10.9	10.9
1/2"	44.7	99.	6	100.0	72.2	16.9	27.8
3/8"	20.2	87.	0	100.0	58.6	13.7	41.4
#4	4.1	19.	1	97.1	42.0	16.6	58.0
#8	1.5	6.9)	80.5	32.9	9.1	67.1
#16	1.3	3.9)	63.5	25.8	7.1	74.2
#30	1.1	2.7	,	46.3	18.9	6.9	81.1
#50	0.9	2.4		23.4	9.8	9.1	90.2
#100	0.9	2.3	3	8.0	3.8	6.0	96.2
LBW	0.6	2.1		1.7	1.2	2.6	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.

Coarsene	ess Factor:	62	Workability Factor:	33	
ability Factor (%) 08 98 98	45, 44	52, 34	68, 38 60186 Production Gradation	JMF Zone 75, 39	
25 +	Operating Zone Boundary	50 55	- 60 CE 70	75, 28	90
40 ActionLimits B	45 Boundary = 	50 55	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"	89.2	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:

Concrete Grade: DM, 4500HP 5/30/22

6/6/2022

Dates Test F	Represents:	5/31/2022	through	6/6/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1480	8.82	2.69	50.2
26A	58-003	Stoneco	320	1.91	2.69	10.8
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2950	17.68		100.0

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

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	2950	17.68		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"	100.0	10	0.0	100.0	100.0	0.0	0.0
3/4"	78.3	100.0		100.0	89.1	10.9	10.9
1/2"	44.7	99	9.6	100.0	72.2	16.9	27.8
3/8"	20.2	87.0		100.0	58.6	13.7	41.4
#4	4.1	19.1		97.1	42.0	16.6	58.0
#8	1.5	6.9		80.5	32.9	9.1	67.1
#16	1.3	3.9		63.5	25.8	7.1	74.2
#30	1.1	2	.7	46.3	18.9	6.9	81.1
#50	0.9	2	.4	23.4	9.8	9.1	90.2
#100	0.9	2	.3	8.0	3.8	6.0	96.2
LBW	0.6	2	.1	1.7	1.2	2.6	98.8
Production Grad	dation O Batch Plant Grada	ntions	regate Supplier Gr	adations	Adjusted WF	Intial Production	on Sample (IPS

Coarseness Factor:	62	Workability Factor:	33	35.4
45 45, 44 45, 33 Operating Zone Boundary	52, 34	60,135 oduction Gradation 67, 40 68, 38 60,135 oduction Gradation	JMF Zone 75, 39	
25	<u>50</u> 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 Approved BY:

Sample Date:

Concrete Grade: DM, 4500HP 5/30/22

Dates Test F	Represents:	5/31/2022	through	6/6/2022		
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	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.:

Contractor:

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

	i otai vvt	2905	17.09		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"	87.9	10	0.0	100.0	93.8	5.6	6.2
1/2"	43.8	95	5.5	100.0	70.6	23.2	29.4
3/8"	23.7	77	' .9	100.0	58.7	11.9	41.3
#4	5.2	17	' .9	96.5	42.5	16.2	57.5
#8	3.0	5	.8	78.6	33.2	9.3	66.8
#16	2.5	2	.8	61.6	25.9	7.3	74.1
#30	2.3	2	.1	46.1	19.6	6.3	80.4
#50	2.2	1.	.9	25.4	11.4	8.3	88.6
#100	2.0	1.	.7	5.2	3.2	8.1	96.8
LBW	1.5	1.	.4	0.9	1.3	2.0	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.

63

*% 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	35.7	Coars	seness Factor
45				$\neg \top$	Worl	kability Factor
45, 44	52, 41		JMF Zone]	Sieve	Cumulative % Passing
_ 40 -	57,4	0 68, 40		- 11	2"	100.0
ર્કુ ⁴⁰]		68, 38	75, 39	- 11	1.5"	100.0
:		7		- 11	1"	99.3
35		■ 60, 3ୟ B&uction Gradation		- 11	3/4"	89.0
35		_			1/2"	70.3
	52, 34	<u> </u>		- 11	3/8"	59.9
45, 33	57.2	68 32			#4	41.9
30 -	,-	2 688, 32 688, 31			#8	35.9
30 - 45, 33 Operating Zone Boundary	7		⊸ l		#16	27.8
Boundary			75, 28		#30	18.9
25					#50	6.3
40 45	50 55 _	60 65 70	75	80	#100	1.7
	`` C	oarseness Factor (%) ⁷⁰			LBW	1.0

Work	ability Factor:	36	
Sieve	Cumulative	%	Cumulative
	% 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

5/31/2022

2.2

Batch Plant Gradations

PLANT #: P-32

Sample Date:

#100

LBW

Production Gradation

Dates Test Represents:

5/30/22 Concrete Grade: DM, 4500HP

6/6/2022

6.9

	ME
%	
ntribution	
51.8	

Cumulative

4.0

1.5

38.0

Contractor:

Cumulative

96.0

98.5

Coarseness Factor:

DOT No.:

7.0

2.5

Adjusted WF Intial Production Sample (IPS)

Specific ft³ Agg. Class Pit# Source Weight (SSD) Gravity Co 6AA 71-47 Presque Isle 1505 9.21 2.62 26A 71-47 Presque Isle 250 1.53 2.62 8.6 2NS 95-013 Smelter Bay 1150 6.95 2.65 39.6 Total Wt 2905 17.69 100.0

1.7

through

<---- Verify this number is 100%

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Farmington Hills, MI 48336

Sieve	6AA	26A	2NS	% Passing	% Retained	% Retained	
2"	100.0	100.0	100.0	100.0	0.0	0.0	1
1.5"	100.0	100.0	100.0	100.0	0.0	0.0	1
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"	42.6	95.5	100.0	69.9	20.4	30.1	1
3/8"	23.7	77.9	100.0	58.6	11.3	41.4	1
#4	5.6	17.9	96.6	42.7	15.9	57.3	١,
#8	3.0	5.8	84.6	35.5	7.1	64.5	no
#16	2.6	2.8	69.8	29.2	6.3	70.8	١,
#30	2.4	2.1	50.8	21.5	7.7	78.5	no
#50	2.3	1.9	24.5	11.1	10.5	88.9	1

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:	64	Workability Factor:	36	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Production Gradation 68, 38 60, 38S	75, 39	
40 45 ActionLimits 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"	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

Pleasant Lake

Batch Plant Gradations

PLANT #: P-35

81-019

Sample Date:

6AA

26A

2NS

Production Gradation

Concrete Grade: DM, 4500HP 5/30/22

6.95

2.65

39.0

35.4

Dates Test Represents: 5/31/2022 6/6/2022 through Specific % ft³ Agg. Class Pit# Source Weight (SSD) Gravity Contribution 58-003 Stoneco 1480 8.82 2.69 50.2 58-003 320 1.91 2.69 10.8 Stoneco

1150

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

Contractor:



Superior Materials, I	<u>LC</u>
30701 W. 10 Mile Rd.	
Suite 500	
Farmington Hills, MI 48	336

Total Wt		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"	100.0	10	0.0	100.0	100.0	0.0	0.0	
3/4"	78.3	10	0.0	100.0	89.1	10.9	10.9	
1/2"	44.7	99	9.6	100.0	72.2	16.9	27.8	
3/8"	20.2	87	7.0	100.0	58.6	13.7	41.4	
#4	4.1	19	9.1	97.1	42.0	16.6	58.0	
#8	1.5	6	.9	80.5	32.9	9.1	67.1	
#16	1.3	3	.9	63.5	25.8	7.1	74.2	
#30	1.1	2	.7	46.3	18.9	6.9	81.1	
#50	0.9	2	.4	23.4	9.8	9.1	90.2	
#100	0.9	2	.3	8.0	3.8	6.0	96.2	
LBW	0.6	2	.1	1.7	1.2	2.6	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.

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:	62	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	66, 38 60, 36 60, 38 60, 38 67, 80, 31	JMF Zone 75, 39	
Boundary 25 40 45 ActionLimits Boundary =	50	55 Coarseness Factor (%) ⁷⁰	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"	89.1	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

5/30/22

PLANT #: P-36

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.6

Dates Test F	Represents:	5/31/2022	through	6/6/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	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
		Total Wt	2905	17.69		100.0

Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific	%
, iggi Giaco					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
		Total Wt	2905	17.69		100.0

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Superior Materials, LLC 30701 W. 10 Mile Rd.

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"	98.8	10	0.0	100.0	99.3	0.7	0.7
3/4"	87.9	10	0.0	100.0	93.3	6.0	6.7
1/2"	43.8	95	5.5	100.0	68.7	24.6	31.3
3/8"	23.7	77	' .9	100.0	56.4	12.3	43.6
#4	5.2	17	' .9	97.2	40.9	15.5	59.1
#8	3.0	5	.8	82.0	33.1	7.8	66.9 r
#16	2.5	2	.8	67.4	27.1	6.0	72.9
#30	2.3	2	.1	49.0	20.0	7.1	80.0 r
#50	2.2	1	.9	22.2	9.8	10.2	90.2
#100	2.0	1	.7	2.7	2.2	7.5	97.8 a
LBW	1.5	1	.4	0.5	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 Fac	tor: 65	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Bounds		58, 39 60, 36 IPS Production Gra	JMF Zone 75, 39 dation 75, 28	
25 40 45 ActionLimits Boundary =	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

Sample Date:

Production Gradation

5/30/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	5/31/2022	through	6/6/2022		
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	44-051	Krake Willis Rd	1100	6.65	2.65	37.9

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

34.6



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

	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"	98.2	100	0.0	100.0	99.0	1.0	1.0
3/4"	83.3	100	0.0	100.0	90.8	8.2	9.2
1/2"	46.0	96	.2	100.0	69.9	20.9	30.1
3/8"	27.8	85	.3	100.0	59.1	10.8	40.9
#4	4.4	23	.5	96.4	40.6	18.5	59.4
#8	1.9	7.	3	80.6	32.1	8.5	67.9
#16	1.6	3.	4	66.0	26.1	6.0	73.9
#30	1.5	2.	5	50.2	20.0	6.1	0.08
#50	1.5	2.	3	27.6	11.4	8.6	88.6
#100	1.4	2.	1	9.2	4.4	7.0	95.6
LBW	1.3	1.	9	1.6	1.5	2.9	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:	60	Workability Factor:	32	
45 45, 44 45, 44 Operating Zone Boundary	52, 41	58, 40 60, 36 IPS 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

Source

Presque Isle

Presque Isle

Ray Rd

Batch Plant Gradations

1150

PLANT #: P-02

Pit#

71-47

71-47

63-115

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

Production Gradation

2.65

39.6

35.7

5/30/22 Concrete Grade: DM, 4500HP 5/31/2022

6.95

through	6/6/2022		
Weight (SSD)	ft ³	Specific Gravity	% Contribution
1500	9.17	2.62	51.6
255	1.56	2.62	8.8

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:



Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
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"	98.8	100.0	100.	0 99.4	0.6	0.6
3/4"	87.9	100.0	100.	0 93.8	5.6	6.2
1/2"	43.8	95.5	100.	0 70.6	23.2	29.4
3/8"	23.7	77.9	100.	0 58.7	11.9	41.3
#4	5.2	17.9	96.5	5 42.5	16.2	57.5
#8	3.0	5.8	78.6	33.2	9.3	66.8
#16	2.5	2.8	61.6	3 25.9	7.3	74.1
#30	2.3	2.1	46.1	19.6	6.3	80.4
#50	2.2	1.9	25.4	11.4	8.3	88.6
#100	2.0	1.7	5.2	3.2	8.1	96.8
LBW	1.5	1.4	0.9	1.3	2.0	98.7

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:	62	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 - 68, 39 68, 38 68, 38 68, 38 68, 38	JMF Zone 75, 39	
Boundary 25 40 45	50 5	5 60 65 70 Coarseness Factor (%)	75, 28 75	80
ActionLimits Boundary =		Coarseness Factor (%)		

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