Aggregate Optimization Chart

Batch Plant Gradations

Production Gradation

Production Gradation Report

PLANT #: P-101 Contractor:

Sample Date: 6/20/22 Concrete Grade: DM, 4500HP Dates Test Represents: 6/21/2022 6/27/2022 MDOT No.: through

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1560	9.54	2.62	53.6
26A	71-47	Presque Isle	200	1.22	2.62	6.9
2NS	75-051	Mid Michigan	1150	6.93	2.66	39.5
		Total Wt	2910	17.69		100.0



Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:

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"	97.3	100.0	100.0	98.6	1.4	1.4
3/4"	82.7	100.0	100.0	90.7	7.8	9.3
1/2"	41.6	97.6	100.0	68.5	22.2	31.5
3/8"	20.1	85.7	100.0	56.2	12.3	43.8
#4	3.5	24.8	98.8	42.6	13.6	57.4
#8	2.1	7.0	83.4	34.6	8.1	65.4 r
#16	1.7	3.6	66.9	27.6	7.0	72.4
#30	1.6	2.9	49.8	20.7	6.9	79.3 r
#50	1.5	2.6	24.3	10.6	10.2	89.4
#100	1.4	2.4	6.5	3.5	7.1	96.5
LBW	1.3	2.2	0.9	1.2	2.3	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:	67	Workability Factor:	35	37.1
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 60, 3\beta_S 67, 31 67, 39 68, 38 67, 31	JMF Zone 75, 39 ion Gradation 75, 28	
40 45 ActionLimits Boundary =	50	Coarseness Factor (%)	75	80

Work	ability Factor:	35	
Sieve	Sieve Cumulative % Passing		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

Sample Date:

LBW

Production Gradation

6/20/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.2
26A	58-003	Stoneco	200	1.19	2.69	6.8
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2950	17.68		100.0

Contractor:

MDOT No.:



---- Verify this number is 100%

1.1

35.5

2.4

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

Cumulative % Retained	
0.0	Suite 500
0.0	Farmington Hills, MI 48336

Cumulative 6AA 26A 2NS % Retained Sieve % % Passing 2" 100.0 100.0 100.0 100.0 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" 80.7 100.0 100.0 89.5 10.5 10.5 1/2' 47.5 99.6 100.0 71.5 18.0 28.5 3/8' 28.1 75.8 100.0 59.4 12.1 40.6 42.4 #4 5.1 13.4 99.4 16.9 57.6 #8 1.8 4.6 81.4 33.0 9.4 67.0 #16 1.3 2.9 63.2 25.5 7.5 74.5 #30 2.5 81.6 1.0 45.3 18.4 7.2 #50 1.0 2.2 22.7 9.5 8.8 90.5 #100 0.9 2.0 7.3 3.5 6.1 96.5

Aggregate Supplier Gradations

1.8

*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:	61	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 68, 38 69, 38 60, 38 60, 38 60, 38	75, 39	
40 45 ActionLimits Boundary =	50 5	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

0.8

Batch Plant Gradations

Sample Date:

Production Gradation

6/20/22

		Concrete	Grade:	DIVI, 4500F	11
 Alexa ale	0/27/2022				_

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific	%
Agg. Class	FIL#	Source	weight (SSD)	It	Gravity	Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.2
26A	58-003	Stoneco	200	1.19	2.69	6.8
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	2950	17.68		100.0

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.5

Contractor:

SUPERIO	R

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

Farmington Hills, MI 48336

	l otal 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	ı
1"	100.0	100.0	100.0	100.0	0.0	0.0	l
3/4"	80.7	100.0	100.0	89.5	10.5	10.5	
1/2"	47.5	99.6	100.0	71.5	18.0	28.5	ı
3/8"	28.1	75.8	100.0	59.4	12.1	40.6	*1
#4	5.1	13.4	99.4	42.4	16.9	57.6	*,
#8	1.8	4.6	81.4	33.0	9.4	67.0	no
#16	1.3	2.9	63.2	25.5	7.5	74.5	*(
#30	1.0	2.5	45.3	18.4	7.2	81.6	no
#50	1.0	2.2	22.7	9.5	8.8	90.5	*(
#100	0.9	2.0	7.3	3.5	6.1	96.5	a 2
LBW	0.8	1.8	1.4	1.1	2.4	98.9	ĺ

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.

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

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

Coarseness Factor:	61	Workability Factor:	33	
45 45, 44 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 69, 38 69, 38 67, 32 67, 32, 31	75, 39	
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"	89.2	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

PREPARED BY: SM, LLC Technical Service Approved BY:

Sample Date:

Concrete Grade: DM, 4500HP

Contractor:

Dates Test Represents: 6/21/2022 through

6/20/22

	6/27/2022		
'n	£13	Specific	%
SD) ft ³	ıτ	Gravity	Contribution

Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

MDOT No.:

Coarseness Factor:

SUPERIOR	

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.

•	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"	99.4	10	0.0	100.0	99.7	0.3	0.3
3/4"	82.2	10	0.0	100.0	91.1	8.6	8.9
1/2"	44.0	93	3.3	100.0	71.3	19.8	28.7
3/8"	22.1	8′	1.7	100.0	59.1	12.2	40.9
#4	4.7	24	1.3	97.3	43.4	15.7	56.6
#8	2.7	7	.7	82.0	34.6	8.8	65.4
#16	2.3	3	.5	65.0	27.2	7.4	72.8
#30	2.2	2	.5	47.9	20.3	6.9	79.7
#50	2.1	2	.2	25.0	11.2	9.1	88.8
#100	2.0	2	.0	5.3	3.3	7.9	96.7
LBW	1.6	1	.7	0.9	1.3	2.0	98.7
Production Gra	dation O Batch Plant Grada	ations	gregate Supplier Gr	adations	Adjusted WF	Intial Producti	on Sample (IPS

Production Gradation	Adjusted '
Coarseness Factor: 63 Workability Factor: 35	37.1
45 45, 44 JMF Zone 40 68, 40 75, 39 Production Gradation 60, 3QPS Operating Zone Boundary 75, 28	
40 45 50 55 Coarseness Factor (%) 75 ActionLimits Boundary =	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"	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:

Production Gradation

6/20/22 Concrete Grade: **DM**, **4500HP**

Concrete Grade: **DM**, **4500HP** 6/27/2022

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1305	7.98	2.62	44.9
26A	71-47	Presque Isle	450	2.75	2.62	15.5
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

MDOT No.:

SUPERIOR

---- Verify this number is 100%

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

37.5

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

	TOTAL WIL	2905 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"	97.6	100.0	100.0	98.9	1.1	1.1
3/4"	83.6	100.0	100.0	92.6	6.3	7.4
1/2"	35.2	93.3	100.0	69.9	22.8	30.1
3/8"	15.6	81.7	100.0	59.3	10.6	40.7
#4	3.0	24.3	95.5	42.9	16.3	57.1
#8	2.1	7.7	82.9	35.0	8.0	65.0 r
#16	1.9	3.5	68.2	28.4	6.6	71.6
#30	1.8	2.5	48.9	20.6	7.8	79.4 r
#50	1.7	2.2	23.6	10.4	10.1	89.6
#100	1.6	2.0	6.4	3.6	6.9	96.4 a
LBW	1.2	1.7	0.6	1.0	2.5	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.

 $\ensuremath{^{*}\%}$ 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, 41	67, 40 68, 38 Production Gradation 60, 38S	75, 39 75, 28	
25 + 40 45 ActionLimits Boundary =	50	55 Coarseness Factor (%)	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"	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

62

PREPARED BY: SM, LLC Technical Service Approved By

Sample Date:

Production Gradation

6/20/22 6/27/2022

Concrete Grade: DM, 4500HP

MDOT No.		

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.2
26A	58-003	Stoneco	200	1.19	2.69	6.8
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:

35.5

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

	l otal 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"	100.0	10	0.0	100.0	100.0	0.0	0.0
3/4"	80.7	10	0.0	100.0	89.5	10.5	10.5
1/2"	47.5	99	9.6	100.0	71.5	18.0	28.5
3/8"	28.1	75	5.8	100.0	59.4	12.1	40.6
#4	5.1	13	3.4	99.4	42.4	16.9	57.6
#8	1.8	4	.6	81.4	33.0	9.4	67.0
#16	1.3	2	.9	63.2	25.5	7.5	74.5
#30	1.0	2	.5	45.3	18.4	7.2	81.6
#50	1.0	2	.2	22.7	9.5	8.8	90.5
#100	0.9	2	.0	7.3	3.5	6.1	96.5
LBW	0.8	1	.8	1.4	1.1	2.4	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:	61	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41 56, 52, 34	68, 38	JMF Zone 75, 39 75, 28	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	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

61

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP 6/20/22

through	6/27/2022		
oight (CCD)	ft ³	Specific	%
eight (SSD)	ıt.	Cupuday	Camtuibution

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific	%
Agg. Class	110#	Source	Weight (33b)	11	Gravity	Contribution
6AA	71-47	Presque Isle	1450	8.87	2.62	49.9
26A	71-47	Presque Isle	355	2.17	2.62	12.2
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

Contractor:

MDOT No.:

-- Verify this number is 100%

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.8

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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	82.2	100.0	100.0	91.1	8.6	8.9
1/2"	44.0	93.3	100.0	71.2	19.9	28.8
3/8"	22.1	81.7	100.0	58.9	12.3	41.1
#4	4.7	24.3	97.2	42.1	16.8	57.9
#8	2.7	7.7	82.0	33.3	8.8	66.7 r
#16	2.3	3.5	67.0	26.9	6.4	73.1
#30	2.2	2.5	50.1	20.4	6.6	79.6
#50	2.1	2.2	24.6	10.6	9.7	89.4
#100	2.0	2.0	2.7	2.3	8.4	97.7
LBW	1.6	1.7	0.0	1.0	1.3	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.

*% 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, 33 Operating Zone Boundary	52, 41	58, 39	JMF Zone 75, 39	
Boundary 25 40 45 ActionLimits Boundary =	50 5	60 65 Coarseness Factor (%) ⁷⁰	75, 28	80
/ / / / / / / / / / / / / / / / / / /				

Batch Plant Gradations

Work	ability Factor:	35	
Sieve	Sieve Cumulative % Passing		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

6/20/22 Concrete Grade: **DM, 4500HP**

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
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:

34.5



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 <i>A</i>	1	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"	97.3	100.	0	100.0	98.5	1.5	1.5
3/4"	82.7	100.	0	100.0	90.4	8.1	9.6
1/2"	41.6	97.6	6	100.0	67.6	22.9	32.4
3/8"	20.1	85.7	7	100.0	54.9	12.7	45.1
#4	3.5	24.8	3	96.3	40.1	14.8	59.9
#8	2.1	7.0		80.1	32.0	8.1	68.0
#16	1.7	3.6		63.8	25.3	6.6	74.7
#30	1.6	2.9		45.8	18.4	6.9	81.6
#50	1.5	2.6		21.2	9.0	9.4	91.0
#100	1.4	2.4		7.0	3.6	5.4	96.4
LBW	1.3	2.2		1.4	1.4	2.2	98.6

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.

 $\ensuremath{^{*}\%}$ 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:	32	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 40 68, 38 Production 68, 32		
40 45 ActionLimits Boundary =	50 55 	Coarseness Factor (%) ⁷⁰	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"	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

PREPARED BY: SM, LLC Technical Service Approved By

6/20/22

PLANT #: P-02

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP

Dates Test F	Represents:	6/21/2022	through	6/27/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

37.1

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 n	umber is 100%
Sieve	6AA	26	òΑ	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"	99.4	10	0.0	100.0	99.7	0.3	0.3
3/4"	82.2	10	100.0		91.1	8.6	8.9
1/2"	44.0	93	3.3	100.0	71.3	19.8	28.7
3/8"	22.1	81	.7	100.0	59.1	12.2	40.9
#4	4.7	24	1.3	97.3	43.4	15.7	56.6
#8	2.7	7	.7	82.0	34.6	8.8	65.4
#16	2.3	3	.5	65.0	27.2	7.4	72.8
#30	2.2	2	.5	47.9	20.3	6.9	79.7
#50	2.1	2	2.2		11.2	9.1	88.8
#100	2.0	2.0		5.3	3.3	7.9	96.7
LBW	1.6	1	.7	0.9	1.3	2.0	98.7

Aggregate SupplierGradations

Coars	seness Factor:	63	Workability Factor:	35	
45 -	45, 44			JMF Zone	
10tor (%)		52, 41	58, 39 68, 39 68, 38 Production Gradation	75, 39	
Workability Factor (%)	45, 33 Operating Zone Boundary	52, 34	58, 31 689, 331	75, 28	
25 -	0 45	50	55 Coarseness Factor (%)	75, 28	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"	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