Aggregate Optimization Chart

Batch Plant Gradations

Production Gradation

Production Gradation Report

PLANT #: P-101 Contractor:

Concrete Grade: DM, 4500HP Sample Date: 7/25/22 Dates Test Represents: 7/26/2022 8/1/2022 MDOT No.: 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

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:

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

	i otai wt	2910	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"	98.5	10	0.0	100.0	99.2	0.8	0.8
3/4"	86.0	10	0.0	100.0	93.0	6.3	7.0
1/2"	46.3	98	3.4	100.0	72.9	20.1	27.1
3/8"	23.6	87	7.0	100.0	60.3	12.6	39.7
#4	3.3	23	3.6	99.0	43.2	17.1	56.8
#8	1.7	5.	.7	83.4	34.4	8.8	65.6
#16	1.5	3	.2	66.3	27.3	7.1	72.7
#30	1.4	2	.7	48.6	20.2	7.1	79.8
#50	1.4	2	.4	24.5	10.6	9.6	89.4
#100	1.3	2	.3	7.2	3.7	6.9	96.3
LBW	1.2	2	.0	1.0	1.2	2.5	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:	60	Workability Factor:	34	36.9
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 68, 38 68, 38 67, 39 68, 38 67, 39 67, 31 67, 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

Batch Plant Gradations

PLANT #: P-102

Sample Date:

Production Gradation

7/25/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	7/26/2022	through	8/1/2022		
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

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

	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"	84.8	100.0	100.0	92.3	7.7	7.7
1/2"	45.7	99.8	100.0	72.4	19.9	27.6
3/8"	19.2	88.8	100.0	57.8	14.6	42.2
#4	3.6	12.9	99.1	41.8	16.0	58.2
#8	1.4	4.7	85.3	34.4	7.3	65.6
#16	1.0	3.1	68.1	27.4	7.1	72.6
#30	0.8	2.6	51.0	20.6	6.8	79.4
#50	0.7	2.3	27.0	11.1	9.4	88.9
#100	0.6	2.3	8.8	4.0	7.1	96.0
LBW	0.5	2.0	1.6	1.1	2.9	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:	64	Workability Factor:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Production Grad	JMF Zone 75, 39 dation 75, 28	
25 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

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Sample Date:

Production Gradation

7/25/22 Concrete Grade: DM, 4500HP

Dates Test F	Represents:	7/26/2022	through	8/1/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.9

Contractor:

2 a.cc . cc	100.0000.	.,,	411104911	0/ 1/2022		
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

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	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"	84.8	100.0		100.0	92.3	7.7	7.7
1/2"	45.7	99.8		100.0	72.4	19.9	27.6
3/8"	19.2	88.8		100.0	57.8	14.6	42.2
#4	3.6	12.9		99.1	41.8	16.0	58.2
#8	1.4	4.7		85.3	34.4	7.3	65.6
#16	1.0	3.1		68.1	27.4	7.1	72.6
#30	0.8	2.6		51.0	20.6	6.8	79.4
#50	0.7	2.3		27.0	11.1	9.4	88.9
#100	0.6	2.3		8.8	4.0	7.1	96.0
LBW	0.5	2.0)	1.6	1.1	2.9	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:	64	Workability Factor:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Production Gra	75, 28	
40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

O 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

PREPARED BY: SM, LLC Technical Service Approved BY:

Sample Date:

Concrete Grade: DM, 4500HP 7/25/22 8/1/2022

Dates Test Represents:		7/26/2022	through	8/1/2022			
	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	150	0.92	2.62	5.2
	2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
			T-4-1 \A/4	200E	47.00		400.0

Contractor:

MDOT No.:



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

lot		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"	98.4	10	0.0	100.0	99.1	0.9	0.9
3/4"	79.8	100.0		100.0	88.8	10.3	11.2
1/2"	44.9	95.7		100.0	69.3	19.5	30.7
3/8"	23.7	84	l.9	100.0	57.1	12.3	42.9
#4	4.3	28	3.6	96.2	41.9	15.1	58.1
#8	1.9	9.1		78.0	32.4	9.5	67.6
#16	1.6	4.1		60.3	25.0	7.4	75.0
#30	1.5	2.9		44.2	18.5	6.5	81.5
#50	1.5	2	.6	24.9	10.8	7.7	89.2
#100	1.4	2	.4	6.7	3.5	7.3	96.5
LBW	1.1	1	.7	1.2	1.2	2.4	98.8

*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.

Production Gradation O Ba	atch Plant Gradations	 Aggregate Supplier Gradation 	S	Adjusted WF	Intial Production	on Sample (IPS)
Coarseness Factor:	64	Workability Factor:	32	34.9	Coars	eness Factor:
7 45				$\neg \top$	Work	ability Factor:
45, 44			JMF Zone	7 I I	Sieve	Cumulative
-	52, 41			-	Sieve	% Passing
1 40]	57, 40	68, 40			2"	100.0
(%)	i	68, 38	75, 39		1.5"	100.0
-	!				1"	99.3
2		■ 60, 36PS			3/4"	89.0
Factor 1 2 35 1	i	Production Gradation		1/2"	70.3	
	52, 34	<u> </u>		- 11	3/8"	59.9
Noverting 30 department of the second	37-22	68 32			#4	41.9
G 30	0.,0	68, 32 68, 31		- 11	#8	35.9
Operating Zone			_	- 11	#16	27.8
Boundary			75, 28	- 11	#30	18.9
> 25					#50	6.3
40 45 50	0 55	60 65 70	75	80	#100	1.7
	Coa	rseness Factor (%)	-		LBW	1.0
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"	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

7/25/22 Concrete Grade: DM, 4500HP

 MDOT No.:	

36.2

Coarseness Factor:

Contractor:

Dates Test Represents: 7/26/2022 8/1/2022 through Specific % ft³ Agg. Class Pit# Weight (SSD) Source Gravity Contribution 6AA 71-47 Presque Isle 1755 10.73 2.62 60.4 26A 71-47 Presque Isle 0 0.00 2.62 0.0 2NS 95-013 Smelter Bay 1150 6.95 2.65 39.6 2905 Total Wt 17.69

<---- Verify this number is 100%

SUPERIOR MATERIALS	

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

	i Otai Wt	2903	17.03		100.0	< verily this h	uniber is 100%	
Sieve	6AA	26	6A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained	
2"	100.0	100.0		100.0	100.0	0.0	0.0	i
1.5"	100.0	10	100.0		100.0	0.0	0.0	ı
1"	98.9	10	100.0		99.3	0.7	0.7	ı
3/4"	87.3	10	100.0		92.3	7.0	7.7	ı
1/2"	53.7	95	95.7		72.0	20.3	28.0	ı
3/8"	28.0	84	84.9		56.5	15.5	43.5	*
#4	4.8	28.6		95.6	40.7	15.8	59.3	*
#8	2.3	9	9.1		33.7	7.1	66.3	no
#16	2.0	4	4.1		27.6	6.1	72.4	*
#30	1.9	2	.9	47.8	20.1	7.5	79.9	no
#50	1.8	2	.6	24.1	10.6	9.4	89.4	*
#100	1.7	2.4		7.7	4.1	6.6	95.9	a 2
LBW	1.3	1	.7	1.8	1.5	2.6	98.5	ı
Production C	Gradation O Batch Plant Gra	dations	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.

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*% 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:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	66, 40 67, 40 68, 38 Production Grad	JMF Zone 75, 39 dation 75, 28	
25 40 45 ActionLimits Boundary =	50 5	⁵ Coarseness Factor (%) ⁷⁰	75	80

Workability 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:

Production Gradation

7/25/22 Concrete Grade: DM, 4500HP

sents:	7/26/2022	through	8/1/2022		
it#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
-003	Stoneco	1500	8.94	2.69	50.8
000	Ctonoco	200	1.70	2.60	10.0

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.9

Dates Test Repres Pi Agg. Class 6AA 58-26A 58-003 Stoneco 300 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%

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

Cumulative Cumulative 6AA 26A % Retained Sieve 2NS % 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" 84.8 100.0 100.0 92.3 7.7 7.7 1/2' 45.7 99.8 100.0 72.4 19.9 27.6 3/8' 88.8 100.0 57.8 14.6 42.2 19.2 #4 3.6 12.9 99.1 41.8 16.0 58.2 #8 1.4 4.7 85.3 34.4 7.3 65.6 #16 1.0 3.1 68.1 27.4 7.1 72.6 #30 0.8 20.6 6.8 79.4 2.6 51.0 #50 0.7 2.3 27.0 11.1 9.4 88.9 #100 0.6 2.3 8.8 4.0 7.1 96.0 LBW 0.5 2.0 1.1

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.

*% 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	_ `	68, 38 Production Grad	JMF Zone 75, 39 dation 75, 28	
25	50 5	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

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Sample Date:

7/25/22 Concrete Grade: DM, 4500HP

7/26/2022 8/1/2022 through

Dates Test F	Represents:	7/26/2022	through	8/1/2022		
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	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

MDOT No.:

Contractor:

---- Verify this number is 100%

SUPERIOR MATERIALS

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

	Fa

63 35

*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 WI	2905 17.69		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"	98.4	100.0	100.0	99.1	0.9	0.9
3/4"	79.8	100.0	100.0	88.8	10.3	11.2
1/2"	44.9	95.7	100.0	69.3	19.6	30.7
3/8"	23.7	84.9	100.0	56.8	12.5	43.2
#4	4.3	28.6	97.4	41.2	15.6	58.8
#8	1.9	9.1	82.8	33.0	8.2	67.0
#16	1.6	4.1	68.5	27.1	5.9	72.9
#30	1.5	2.9	50.5	20.2	7.0	79.8
#50	1.5	2.6	21.6	9.2	11.0	90.8
#100	1.4	2.4	2.8	2.0	7.2	98.0
LBW	1.1	1.7	0.4	0.9	1.1	99.1
	O D. I. J. Dl I G	A	C - Luii			

Aggregate Supplier Gradations Batch Plant Gradations **Production Gradation Workability Factor:** 33 35.5 **Coarseness Factor:** 64 **Workability Factor:**

Adjusted WF Intial Production Sample (IPS) **Coarseness Factor:**

	45 -	45, 44	- JMF Zone
(%)	40 -	52, 41 58, 39 68, 38	75, 39
Workability Factor (%)	35 -	■ 60, 36 Production Gradation	n
kability	30 -	45, 33 58, 31 Operating Zone	
Wor	25 -	Boundary	75, 28
(Ac		0 45 50 55 Coarseness Factor (%) 70 mits Boundary =	75 80

Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

6AA

100.0

100.0

98.5

Sample Date:

Sieve

2"

1.5"

7/25/22 Concrete Grade: DM, 4500HP 8/1/2022

Dates Test F	Represents:	7/26/2022	through	8/1/2022		
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
		Total Wt	2905	17.69		100.0

26A

100.0

100.0

100.0

MDOT No.:

79.5

89.4

96.3

98.7

---- Verify this number is 100%

SUPERIOR	

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

Cumulative Cumulative % Retained % Passing % Retained 100.0 0.0 0.0 100.0 0.0 0.0 99.2 8.0 8.0 7.7 29.8 43.1 59.8 67.4 73.1

Contractor:

*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.

I 73				¬	T T	Г
45 —	AE .					
Coarsen	ess Factor: 64	Workability Factor:	33	35.1	Coars	е
Production G	Gradation O Batch Plant Gra	dations	dations	Adjusted WF	Intial Producti	or
LBW	1.2	2.0	1.3	1.3	2.4	
#100	1.3	2.3	7.5	3.7	6.9	Γ
#50	1.4	2.4	25.5	10.6	9.9	ſ
#30	1.4	2.7	51.6	20.5	6.5	ſ
#16	1.5	3.2	68.4	26.9	5.7	ſ
#8	1.7	5.7	82.7	32.6	7.5	Γ
#4	3.3	23.6	97.0	40.2	16.7	Γ
3/8"	23.6	87.0	100.0	56.9	13.3	Γ
1/2"	46.3	98.4	100.0	70.2	22.0	Ī
3/4"	86.0	100.0	100.0	92.3	6.9	Г
					0.0	

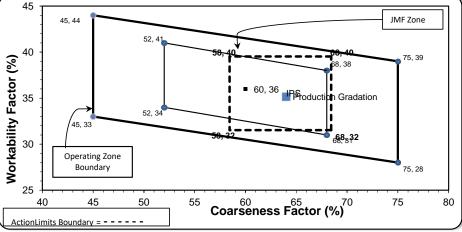
Production Gradation	Batch Plant Gra	dations	 Aggregate Supplier Grada 	ations	Adjusted WF	Intial Production Sample (IPS))
Coarseness Factor:	64		Workability Factor:	33	35.1	Coarseness Factor:	63
45						Workability Factor:	36
70						Cumulativa	0/

2NS

100.0

100.0

100.0



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	

PREPARED BY: SM, LLC Technical Service Approved By:

#100

LBW

Production Gradation

Sample Date: 7/25/22 Concrete Grade: DM, 4500HP Dates Test Represents: 7/26/2022 8/1/2022 through

MDOT	No.:

7.3

2.4

Adjusted WF Intial Production Sample (IPS)

Contractor:

24100 10011	100.000	.,,_	un o a g	0, 1, 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	150	0.92	2.62	5.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

---- Verify this number is 100%

SUPERIOR MATERIALS
Superior Materials, LLC
30701 W. 10 Mile Rd.

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"	98.4	100.0	100.0	99.1	0.9	0.9
3/4"	79.8	100.0	100.0	88.8	10.3	11.2
1/2"	44.9	95.7	100.0	69.3	19.5	30.7
3/8"	23.7	84.9	100.0	57.1	12.3	42.9
#4	4.3	28.6	96.2	41.9	15.1	58.1
#8	1.9	9.1	78.0	32.4	9.5	67.6
#16	1.6	4.1	60.3	25.0	7.4	75.0
#30	1.5	2.9	44.2	18.5	6.5	81.5
#50	1.5	2.6	24.9	10.8	7.7	89.2

6.7

3.5

34.9

2.4

1.7

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.

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:	64	Workability Factor:	32	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 68, 39 68, 38 68, 38 Figure 19 Production Gradation	JMF Zone 75, 39	
Operating Zone Boundary 25 40 45	50	55 Coarseness Factor (%)	75, 28 75	80
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"	95.1	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

96.5

98.8

Coarseness Factor:

PREPARED BY: SM, LLC Technical Service

1.4

Batch Plant Gradations