Aggregate Optimization Chart

Batch Plant Gradations

Production Gradation

Production Gradation Report

PLANT #: P-101 Contractor:

Sample Date: 5/2/22 Concrete Grade: DM, 4500HP

Dates Test Represents: 5/3/2022 through 5/9/2022

2162 16211	represents.	3/3/2022	unougn	3/3/2022		
gg. 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.:

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.	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"	99.2	100	0.0	100.0	99.6	0.4	0.4	
3/4"	85.6	100	0.0	100.0	92.8	6.8	7.2	
1/2"	42.8	96	.4	100.0	70.9	21.8	29.1	
3/8"	21.8	85	.6	100.0	59.3	11.6	40.7	*
#4	2.9	18	.0	98.5	42.2	17.0	57.8	*
#8	1.6	4.	9	83.3	34.2	8.0	65.8	no
#16	1.4	2.	5	68.3	28.0	6.3	72.0	*
#30	1.3	2.:	2	53.3	21.9	6.0	78.1	no
#50	1.3	2.	0	29.2	12.4	9.5	87.6	*
#100	1.3	1.3	8	7.3	3.7	8.7	96.3	a 2
LBW	1.2	1.0	6	0.6	1.0	2.7	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:	34	36.7
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 68, 38 60, 36S Production Gradation 60, 36S	75, 39 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"	95.0	5.0	5.0
1/2"	70.5	24.5	29.5
3/8"	60.0	60.0 10.5	
#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

Approved By:

Sample Date:

Production Gradation

5/2/22 Concrete Grade: DM, 4500HP

Dates Test F	represents:	5/3/2022	through	5/9/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1525	9.09	2.69	51.6
26A	58-003	Stoneco	280	1.67	2.69	9.5
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9

Contractor:

MDOT No.:



Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.2

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

	I otal Wt	2955	17.71		100.0	< Verify this n	umber 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
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"	85.9	10	0.0	100.0	92.7	7.3	7.3
1/2"	48.7	99	9.8	100.0	73.5	19.2	26.5
3/8"	25.8	89	9.6	100.0	60.7	12.8	39.3
#4	5.4	11	.7	98.5	42.2	18.5	57.8
#8	1.6	3	.9	83.5	33.7	8.5	66.3
#16	1.2	2	.7	67.7	27.2	6.5	72.8
#30	1.0	2	.3	51.4	20.7	6.5	79.3
#50	1.0	2	.1	27.5	11.4	9.3	88.6
#100	0.8	2	.0	7.6	3.6	7.9	96.4
LBW	0.6	1.	.9	0.9	0.8	2.7	99.2

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:	59	Workability Factor:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Preduction 68, 38 68, 38	75, 39	
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"	89.2	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

Concrete Grade: DM, 4500HP 5/2/22

5/3/2022 5/9/2022 through

Adjusted WF Intial Production Sample (IPS)

Contractor:

Dates Test F	Represents:	5/3/2022	through	5/9/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.1
26A	58-003	Stoneco	205	1.22	2.69	6.9
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9
		Total Wt	2955	17.71		100.0

---- Verify this number is 100%

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	ĺ
1.5"	100.0	100.0	100.0	100.0	0.0	0.0	ĺ
1"	100.0	100.0	100.0	100.0	0.0	0.0	ĺ
3/4"	85.9	100.0	100.0	92.4	7.6	7.6	ĺ
1/2"	48.7	99.8	100.0	72.2	20.2	27.8	ĺ
3/8"	25.8	89.6	100.0	59.1	13.1	40.9	ı
#4	5.4	11.7	98.5	42.1	17.0	57.9	ı
#8	1.6	3.9	83.5	33.6	8.4	66.4	n
#16	1.2	2.7	67.7	27.2	6.4	72.8	ı
#30	1.0	2.3	51.4	20.7	6.5	79.3	n
#50	1.0	2.1	27.5	11.4	9.3	88.6	l
#100	0.8	2.0	7.6	3.5	7.9	96.5	а

Aggregate Supplier Gradations

1.9

0.9

8.0

36.1

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

99.2

Coarseness Factor:

PREPARED BY: SM, LLC Technical Service

0.6

O Batch Plant Gradations

Approved BY:

Sample Date:

5/2/22

Contractor:

Concrete Grade: DM, 4500HP

MDOT No.:

Dates Test F	Represents:	5/3/2022	through	5/9/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	48.2
26A	71-47	Presque Isle	355	2.17	2.62	12.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

%	
ntribution	
48.2	
12.2	
39.6	

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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"	99.5	100	0.0	100.0	99.8	0.2	0.2
3/4"	83.8	100	0.0	100.0	92.2	7.6	7.8
1/2"	37.4	93	.6	100.0	69.0	23.1	31.0
3/8"	17.5	80	.6	100.0	57.9	11.2	42.1
#4	3.2	23	.5	96.4	42.6	15.3	57.4
#8	2.4	7.	5	78.0	33.0	9.6	67.0
#16	2.1	3.	5	61.3	25.7	7.2	74.3
#30	2.0	2.	6	45.7	19.4	6.3	80.6
#50	2.0	2.	4	23.8	10.7	8.7	89.3
#100	1.9	2.	3	4.5	3.0	7.7	97.0
LBW	1.5	2.	0	0.9	1.3	1.7	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	s • Aggregate Supplier Gradations	Adjusted WF	Intial Producti	on Sample (IPS)
Coarseness Factor: 63	Workability Factor: 33	35.5	Coars	eness Factor:	
7 45		$\neg \top$	Work	ability Factor:	
45, 44	JMF Zone	$\neg \sqcap$	Sieve	Cumulative	
52, 41			Sieve	% Passing	I
40]		- 11	2"	100.0	
🦃 i	68, 38	- 11	1.5"	100.0	
[7	- 11	1"	99.3	
1 없	■ 60, 36 Production Gradation	- 11	3/4"	89.0	
8 35 1 52 34 52 34 52 34	_ i readonsi. Oradanen	- 11	1/2"	70.3	
1 02,01		- 11	3/8"	59.9	
Operating Zone Boundary	68, 32	- 11	#4	41.9	
30 -	58,31	- 11	#8	35.9	
Operating Zone		- 11	#16	27.8	
S Boundary	75, 28	- 11	#30	18.9	
25			#50	6.3	
The state of the s	60 _6570 75	80	#100	1.7	
	oarseness Factor (%) ⁷⁰ 75		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

5/2/22

PLANT #: P-32

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP

Dates Test F	Represents:	5/3/2022	through	5/9/2022		
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	95-013	Smelter Bay	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:

37.5

---- Verify this number is 100%

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"	98.7	100.0	100.0	99.3	0.7	0.7
3/4"	85.9	100.0	100.0	92.9	6.4	7.1
1/2"	49.1	93.6	100.0	73.8	19.1	26.2
3/8"	26.0	80.6	100.0	60.9	12.9	39.1
#4	5.1	23.5	95.5	42.8	18.1	57.2
#8	2.9	7.5	82.9	35.0	7.7	65.0
#16	2.5	3.5	68.2	28.6	6.4	71.4
#30	2.4	2.6	49.6	21.1	7.5	78.9
#50	2.3	2.4	24.2	11.0	10.1	89.0
#100	2.2	2.3	7.1	4.2	6.8	95.8
LBW	1.9	2.0	1.6	1.8	2.4	98.2

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: 60	Workability Factor:	35	
45 45, 44 45, 44 45, 33 Operating Bound	52, 34 g Zone	68, 38 Production Gradation 60, 38S	75, 39 75, 28	
25 40 45 ActionLimits Boundary		⁵ Coarseness Factor (%) ⁷⁰	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"	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

5/2/22

PLANT #: P-35

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP

Contractor:

Jates Test F	represents:	5/3/2022	tnrougn	5/9/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.1
26A	58-003	Stoneco	205	1.22	2.69	6.9
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9

MDOT No.:



Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.1

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

	I otal Wt	2955	17.71		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"	85.9	10	0.0	100.0	92.4	7.6	7.6
1/2"	48.7	99	9.8	100.0	72.2	20.2	27.8
3/8"	25.8	89	0.6	100.0	59.1	13.1	40.9
#4	5.4	11	.7	98.5	42.1	17.0	57.9
#8	1.6	3	.9	83.5	33.6	8.4	66.4 r
#16	1.2	2	.7	67.7	27.2	6.4	72.8
#30	1.0	2	.3	51.4	20.7	6.5	79.3 r
#50	1.0	2	.1	27.5	11.4	9.3	88.6
#100	0.8	2	.0	7.6	3.5	7.9	96.5
LBW	0.6	1.	.9	0.9	0.8	2.7	99.2

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:	34	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41 56, 52, 34	68, 38 ■ 60 βeoduction Gradation	75, 39	
25 40 45 ActionLimits Boundary =	50 55	Coarseness Factor (%)	75	80

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

5/2/22 Concrete Grade: DM, 4500HP 5/0/2022

Dates Test F	Represents:	5/3/2022	through	5/9/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific	%
Agg. Class	110#	Source	Weight (33b)	11	Gravity	Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	48.2
26A	71-47	Presque Isle	405	2.48	2.62	13.9
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	2905	17 69		100.0

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.0

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

	i otai 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"	99.5	100	0.0	100.0	99.8	0.2	0.2
3/4"	83.8	100	0.0	100.0	92.2	7.6	7.8
1/2"	37.4	93	.6	100.0	68.9	23.3	31.1
3/8"	17.5	80	.6	100.0	57.5	11.4	42.5
#4	3.2	23	.5	97.3	41.7	15.9	58.3
#8	2.4	7.	5	82.6	33.5	8.2	66.5
#16	2.1	3.	5	66.8	26.8	6.7	73.2
#30	2.0	2.	6	48.6	19.7	7.1	80.3
#50	2.0	2.	4	22.6	9.9	9.9	90.1
#100	1.9	2.	3	3.2	2.4	7.4	97.6
LBW	1.5	2.	0	0.4	1.2	1.3	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: 64	Workability Factor:	33	
45, 44 40 40 45, 45, 44 40 40 40 40 40 40 40 40 40 40 40 40	•	58, 39 68, 38 60, 36 Production Gradati	JMF Zone 75, 39	
Open B 25 40 ActionLimits Bounce	rating Zone oundary 45 50	58, 31 68, 31 55 Coarseness Factor (%)	75, 28 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

5/2/22

PLANT #: P-39

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP

Dates Test F	Represents:	5/3/2022	through	5/9/2022		
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	Presaue Isle	300	1.83	2.62	10.3

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

33.4

Contractor:

	•					
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	300	1.83	2.62	10.3
2NS	44-051	Krake Willis Rd	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

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	i otai 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
1.5"	100.0	100	0.0	100.0	100.0	0.0	0.0	1
1"	99.2	100	0.0	100.0	99.6	0.4	0.4	1
3/4"	85.6	100	0.0	100.0	92.5	7.0	7.5	1
1/2"	42.8	96	5.4	100.0	70.0	22.5	30.0	1
3/8"	21.8	85	.6	100.0	58.0	12.0	42.0	1
#4	2.9	18	.0	96.4	39.9	18.1	60.1	1
#8	1.6	4.	9	78.2	30.9	8.9	69.1	n
#16	1.4	2.	5	62.2	24.5	6.4	75.5	1
#30	1.3	2.	2	46.2	18.4	6.1	81.6	n
#50	1.3	2.	0	25.1	10.4	8.0	89.6	1
#100	1.3	1.	8	8.4	4.0	6.3	96.0	а
I RW	1.2	1	6	1.0	1.2	2.0	08.8	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:	61	Workability Factor:	31	
45 45, 44 40 45, 44 45, 33 45, 33 Operating Zone Boundary	52, 41	58, 40 68, 40 68, 38 68, 38 Froduction Gradation 68, 32 68, 32	75, 39 75, 28	
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

Sample Date:

Production Gradation

Concrete Grade: DM, 4500HP 5/2/22

Dates Test Represents:		5/3/2022	through	5/9/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1400	8.56	2.62	48.2
26A	71-47	Presque Isle	355	2.17	2.62	12.2
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt		2905	17.69		100.0	

MDOT No.:

---- Verify this number is 100%

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.5

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Suite 500
Farmington Hills, MI 48336

	i Otal Wit	2000 17.00		100.0	< Volley tillo it	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"	99.5	100.0	100.0	99.8	0.2	0.2
3/4"	83.8	100.0	100.0	92.2	7.6	7.8
1/2"	37.4	93.6	100.0	69.0	23.1	31.0
3/8"	17.5	80.6	100.0	57.9	11.2	42.1
#4	3.2	23.5	96.4	42.6	15.3	57.4
#8	2.4	7.5	78.0	33.0	9.6	67.0
#16	2.1	3.5	61.3	25.7	7.2	74.3
#30	2.0	2.6	45.7	19.4	6.3	80.6
#50	2.0	2.4	23.8	10.7	8.7	89.3
#100	1.9	2.3	4.5	3.0	7.7	97.0
LBW	1.5	2.0	0.9	1.3	1.7	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:	63	Workability Factor:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	58, 39 68, 38 68, 38 Gradation Gradation Gr	75, 28	
25 40 45 ActionLimits Boundary =	50 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"	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