## Aggregate Optimization Chart

## **Production Gradation Report**

PLANT #: P-101 Contractor:

Concrete Grade: DM, 4500HP Sample Date: 3/7/22 Dates Test Represents: 3/8/2022 3/14/2022 through

	10   10 0 0 11101			0, 1, 1, 4		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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

MDOT No.:

**Coarseness Factor:** 

SUPERIOR MATERIALS

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

Suite Soo
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.

62

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

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

	Total Wt	2910	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"	98.5	10	0.0	100.0	99.2	0.8	0.8
3/4"	87.5	10	0.0	100.0	93.3	5.9	6.7
1/2"	49.3	96	6.0	100.0	72.5	20.8	27.5
3/8"	31.3	81	.6	100.0	61.9	10.6	38.1
#4	6.1	15	5.7	98.5	43.3	18.6	56.7
#8	2.6	3.	.7	83.3	34.6	8.7	65.4
#16	2.0	2	.3	68.3	28.2	6.3	71.8
#30	1.8	2	.0	53.3	22.2	6.1	77.8
#50	1.8	1.	.9	29.2	12.6	9.5	87.4
#100	1.7	1.	.8	7.3	3.9	8.7	96.1
LBW	1.5	1.	.7	0.6	1.2	2.8	98.8
oduction Grad	dation O Batch Plant Grada	tions   Agg	regate Supplier Gra	adations	Adjusted WF	Initial Producti	on Sample (IP

Production Gradation	Batch Plant Gradations • Aggregate Supplier Gradations		ations	
Coarseness Factor:	58	Workability Factor:	35	37.1
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 41	57, 39 Production Gradation 60, 36s 67, 31	75, 39	
40 45	50 5	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

PREPARED BY: SM, LLC Technical Service

ActionLimits Boundary = - - - - -

Sample Date:

3/7/22 Concrete Grade: DM, 4500HP

3/14/2022 3/8/2022 through

Dates Test F	Represents:	3/8/2022	through	3/14/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.4
26A	58-003	Stoneco	405	2.41	2.69	13.7
2NS	63-114	Highland	1150	6.95	2.65	38.9
		Total W/t	2055	17 71		100.0

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

Contractor:

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.

•	Total Wt	2955	17.71		100.0	< Verify this n	umber is 100%
Sieve	6AA	26	6 <b>A</b>	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"	81.4	10	0.0	100.0	91.2	8.8	8.8
1/2"	44.3	98	3.9	100.0	73.5	17.7	26.5
3/8"	19.2	70	).9	100.0	57.7	15.7	42.3
#4	1.8	9	.3	99.8	41.0	16.8	59.0
#8	1.0	3	.4	88.0	35.2	5.8	64.8
#16	0.8	2	.1	68.6	27.4	7.8	72.6
#30	0.6	1	.8	47.9	19.2	8.2	80.8
#50	0.5	1	.7	20.0	8.3	10.9	91.7
#100	0.4	1	.5	3.3	1.7	6.6	98.3
LBW	0.3	1	.4	0.4	0.5	1.2	99.5
Production Grad	dation O Batch Plant Grada	ations ( ) Agg	regate Supplier Gra	adations	Adjusted WF	Intial Production	on Sample (IPS

Coarseness Factor:	65	Workability Factor:	35	37.7
45 45 45, 44 40 45, 44 45, 33 45, 33 Operating Zone Boundary	52, 34	68, 38 Production Grad 60, 38 60, 38 67, 32 67, 32 67, 32 67, 32	75, 39 lation 75, 28	
25 +	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"	89.2	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

ActionLimits Boundary = - - - - -

Highland

PLANT #: P-103

63-114

Sample Date:

2NS

**Production Gradation** 

Concrete Grade: DM, 4500HP

2.65

38.9

37.7

Dates Lest F	Represents:	3/8/2022	through	3/14/2022		
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.4
26A	58-003	Stoneco	405	2.41	2.69	13.7

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 



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

	Total Wt	2955 17.71		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"	81.4	100.0	100.0	91.2	8.8	8.8
1/2"	44.3	98.9	100.0	73.5	17.7	26.5
3/8"	19.2	70.9	100.0	57.7	15.7	42.3
#4	1.8	9.3	99.8	41.0	16.8	59.0
#8	1.0	3.4	88.0	35.2	5.8	64.8
#16	0.8	2.1	68.6	27.4	7.8	72.6
#30	0.6	1.8	47.9	19.2	8.2	80.8
#50	0.5	1.7	20.0	8.3	10.9	91.7
#100	0.4	1.5	3.3	1.7	6.6	98.3
LBW	0.3	1.4	0.4	0.5	1.2	99.5
Production Gra	adation O Batch Plant Gradat	tions	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:	65	Workability Factor:	35	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	68, 38 Production G	75, 28	
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"	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:

## **Aggregate Optimization Chart**

3/7/22

PLANT #: P-12

Sample Date:

Concrete Grade: DM, 4500HP

Contractor:

Dates Test Represents: 3/8/2022

3/14/2022 through

	-		_		
N/	II 1	()		NI	$\cap$

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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

<b>Superior Materials, LLC</b>
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"	99.4	100	0.0	100.0	99.7	0.3	0.3
3/4"	85.4	100	0.0	100.0	93.0	6.7	7.0
1/2"	36.2	98	.1	100.0	69.0	23.9	31.0
3/8"	19.0	89	.2	100.0	59.6	9.4	40.4
#4	4.1	29	.4	96.9	43.9	15.7	56.1
#8	2.5	11	.3	81.0	34.7	9.3	65.3 r
#16	2.1	4.	9	69.8	29.2	5.4	70.8
#30	2.0	3.	0	49.3	20.8	8.4	79.2 r
#50	1.9	2.	5	27.8	12.2	8.6	87.8
#100	1.8	2.	3	5.3	3.2	9.0	96.8
LBW	1.4	1.	9	0.8	1.2	2.0	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 Batch Plant Grad	dations	ns	Adjusted WF	Intial Producti	on Sample (IPS	)
Coarseness Factor	62	Workability Factor:	35	37.2	Coars	eness Factor:	
45				$\neg \top$	Work	ability Factor:	
45, 44			JMF Zone	]	Sieve	Cumulative % Passing	_
_ 40 -	52, 41	57, 40 68, 40		_	2"	100.0	
		68, 38	75, 39	- 11	1.5"	100.0	
		Production Gradation		- 11	1"	99.3	_
35 - 35 - 35 - 35 - 35 - 35 - 35 - 35 -		■ 60, 36PS		- 11	3/4"	89.0	
35 ]		i		- 11	1/2"	70.3	
	52, 34			- 11	3/8"	59.9	
Operating Zon Boundary		57, 22 68, 32 68, 31		- 11	#4	41.9	
<b>2</b> 30 -		68,31			#8	35.9	
Operating Zon	e		<b>⊸</b>	- 11	#16	27.8	
S Boundary			75, 28		#30	18.9	
<b>&gt;</b> 25 <b>  </b>				I	#50	6.3	
40 45	50 55	_ 60 _65 _70	75	80	#100	1.7	
		Coarseness Factor (%) <sup>70</sup>			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** 

3/7/22

Concrete Grade: DM, 4500HP

Dates Test Represents: 3/8/2022 3/14/2022 through Specific % ft<sup>3</sup> Agg. Class Pit# Weight (SSD) Source 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

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

37.9

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"	95.0	100	0.0	100.0	97.5	2.5	2.5
3/4"	67.8	100	0.0	100.0	83.9	13.6	16.1
1/2"	30.8	98	.1	100.0	65.1	18.7	34.9
3/8"	16.9	89	.2	100.0	57.3	7.9	42.7
#4	5.3	29	.4	95.8	43.6	13.6	56.4
#8	2.2	11	.3	83.6	35.4	8.3	64.6
#16	2.0	4.	9	68.5	28.6	6.7	71.4
#30	1.7	3.	0	49.2	20.6	8.0	79.4 r
#50	1.6	2.	5	24.2	10.6	10.0	89.4
#100	1.4	2.	3	7.2	3.8	6.9	96.2
LBW	0.9	1.	9	1.5	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	r: 66	Workability Factor:	35	
45 45, 44 40 45, 44 45, 33 Operating Zo Boundary	52, 34	67, 40 68, 38 60, 38S 7, 32 60, 38S	75, 39 75, 28	
25 40 45  ActionLimits Boundary = -	50 5	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"	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** 

3/7/22 Concrete Grade: DM, 4500HP

Dates Test I	Represents:	3/8/2022	through	3/14/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1450	8.64	2.69	49.1
26A	58-003	Stoneco	405	2.41	2.69	13.7
2NS	81-019	Pleasant Lake	1100	6.65	2.65	37.2
		Total Wt	2055	17 70		100.0

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.3

---- Verify this number is 100%

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

2955 Cumulative Cumulative 26A 6AA % 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" 81.4 100.0 100.0 90.9 9.1 9.1 1/2' 44.3 98.9 100.0 72.5 18.4 27.5 3/8' 70.9 100.0 56.4 16.2 43.6 19.2 #4 1.8 9.3 99.4 39.2 17.2 60.8 #8 1.0 3.4 85.5 32.8 6.4 67.2 #16 0.8 2.1 67.7 25.9 6.9 74.1 #30 0.6 1.8 48.8 18.7 7.2 81.3 #50 0.5 1.7 23.8 9.3 9.4 90.7 #100 0.4 1.5 6.5 2.8 6.5 97.2 LBW 0.3 1.4 1.1 1.7

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.

\*% 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:	33	
45 45, 44 45, 44 45, 33 Operating Zone Boundary	52, 34	60, 49 Production Gradati	75, 39	
Boundary  25  40  45  ActionLimits Boundary =	50	55 Coarseness Factor (%) <sup>70</sup>	75, 28 75	80
Actionizimics Boundary = = = =				

Batch Plant Gradations

Work	Workability Factor:		
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:

3/7/22 Concrete Grade: DM, 4500HP

	MDOT No.:	
7	-	

**Coarseness Factor:** 

37.2

Contractor:

Dates Test Represents: 3/8/2022 3/14/2022 through Specific ft<sup>3</sup> Agg. Class Pit# Source Weight (SSD) 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

<---- Verify this number is 100%

SUPERIOR MATERIALS

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

	TOTAL WI	2905 17.09		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	İ
1.5"	100.0	100.0	100.0	100.0	0.0	0.0	İ
1"	99.4	100.0	100.0	99.7	0.3	0.3	İ
3/4"	85.4	100.0	100.0	93.0	6.7	7.0	l
1/2"	36.2	98.1	100.0	69.0	24.0	31.0	l
3/8"	19.0	89.2	100.0	59.5	9.5	40.5	*
#4	4.1	29.4	98.0	43.2	16.3	56.8	*
#8	2.5	11.3	84.4	34.7	8.4	65.3	no
#16	2.1	4.9	67.6	27.3	7.4	72.7	*
#30	2.0	3.0	48.6	19.8	7.5	80.2	no
#50	1.9	2.5	20.4	9.0	10.8	91.0	*
#100	1.8	2.3	3.8	2.6	6.4	97.4	a 2
LBW	1.4	1.9	0.6	1.2	1.5	98.8	l
Production Gradation	Batch Plant Gradat	ions    Aggregate Supplier G	iradations	Adjusted WF	Intial Production	on Sample (IPS	3)

\*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:	62	Workability Factor:	35	
45 Aorthographic Asia Asia Asia Asia Asia Asia Asia Asia	52, 41	58, 39 68, 38 68, 38 Production G adation 60, 36 IPS 68,31	75, 39	
40 45  ActionLimits Boundary =	50	Coarseness Factor (%) <sup>70</sup>	75	80

Workability 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"	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:

3/7/22 Concrete Grade: DM, 4500HP

3/14/2022 through

Dates Test F	Represents:	3/8/2022	through	3/14/2022		
Agg. Class	Pit#	Source	Weight (SSD)	ft <sup>3</sup>	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	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	2905	17.69		100.0

MDOT No.:

**Coarseness Factor:** 

Contractor:

35.7

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"	97.4	100	0.0	100.0	98.7	1.3	1.3
3/4"	83.4	100	0.0	100.0	91.4	7.3	8.6
1/2"	38.1	96	.0	100.0	67.5	23.9	32.5
3/8"	19.3	81	.6	100.0	56.3	11.2	43.7
#4	2.8	15.7		98.0	40.2	16.1	59.8
#8	1.7	3.	7	84.4	33.2	7.0	66.8
#16	1.5	2.	3	67.6	26.6	6.6	73.4
#30	1.5	2.	0	48.6	19.4	7.2	80.6
#50	1.4	1.	9	20.4	8.6	10.7	91.4
#100	1.4	1.	8	3.8	2.4	6.3	97.6
LBW	1.3	1.	7	0.6	1.1	1.3	98.9
roduction Grad	dation	ions 💿 Agg	regate Supplier Gr	adations	Adjusted WF	Intial Producti	on Sample (IP

\*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:	65	Workability Factor: 33
45 45,44		JMF Zone
Morkability Factor (%) 35  45, 33  Operating Zone Boundary	52, 41	58, 40 75, 39 68, 38 75, 39 60, 36 IPS Production Gradation
25 +		58, 22 68,832 75, 28
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"	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

3/8/2022

Source

Presque Isle

Presque Isle

Ray Rd

Batch Plant Gradations

PLANT #: P-02

Pit#

71-47

71-47

63-115

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

**Production Gradation** 

3/7/22 Concrete Grade: DM, 4500HP

tnrougn	3/14/2022		
Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
1455	8.90	2.62	50.1
350	2.14	2.62	12.0
1100	6.65	2.65	37.9

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

35.8



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	l otal Wt	2905	17.69		100.0	< 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"	99.4	10	0.0	100.0	99.7	0.3	0.3
3/4"	85.4	10	0.0	100.0	92.7	7.0	7.3
1/2"	36.2	98	3.1	100.0	67.8	24.9	32.2
3/8"	19.0	89	).2	100.0	58.1	9.7	41.9
#4	4.1	29	).4	96.9	42.3	15.8	57.7
#8	2.5	11	.3	81.0	33.3	9.0	66.7
#16	2.1	4	.9	69.8	28.1	5.2	71.9
#30	2.0	3	.0	49.3	20.0	8.0	80.0
#50	1.9	2	.5	27.8	11.8	8.3	88.2
#100	1.8	2	.3	5.3	3.2	8.6	96.8
LBW	1.4	1	.9	0.8	1.2	2.0	98.8

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, 44  45, 44  45, 33  Operating Zone Boundary	52, 41	58, 39 68, 39 68, 38 68, 38 68, 38 68, 38 68, 38 68, 38 68, 38	75, 39	
Boundary  25  40  45  ActionLimits Boundary =	50 5	<sup>5</sup> Coarseness Factor (%)	75, 28	80

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	2.4	7.2	97.6
LBW	0.9	1.5	99.1