

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-20**

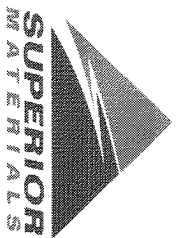
Contractor: \_\_\_\_\_

Sample Date: 10/5/20

Concrete Grade: **P1M**

Dates Test Represents: 10/6/2020 through 10/12/2020

MDOT No.: \_\_\_\_\_



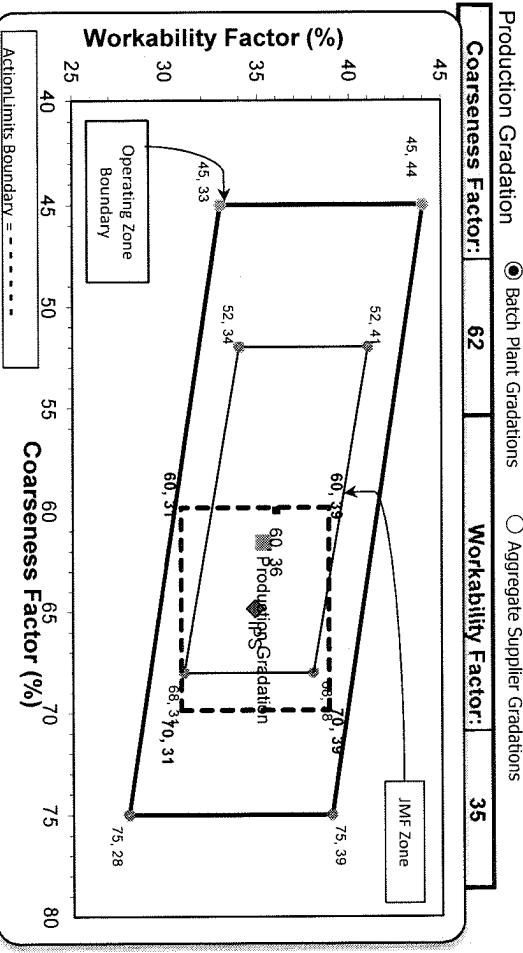
**Superior Materials, LLC**  
30701 W. 10 Mile Rd.  
Suite 500  
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
NNS	63-92	Grange Hall	1200	7.26	2.65	39.1
		<b>Total Wt</b>	<b>3070</b>	<b>18.70</b>		<b>100.0</b>

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.4	0.6	0.6
1"	44.4	100.0	100.0	82.8	16.6	17.2
3/4"	8.0	100.0	100.0	71.3	11.5	28.7
1/2"	2.8	89.1	100.0	66.7	4.6	33.3
3/8"	2.3	68.0	100.0	60.2	6.5	39.8
#4	2.0	18.3	97.2	44.1	16.1	55.9
#8	1.8	6.9	83.6	35.3	8.8	64.7
#16	1.7	4.9	67.4	28.3	7.0	71.7
#30	1.7	4.6	46.8	20.2	8.1	79.8
#50	1.6	4.2	18.3	8.9	11.3	91.1
#100	1.5	3.9	1.5	2.2	6.7	97.8
LBW	1.1	2.8	1.0	1.6	0.6	98.4

\*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 Gradations  Aggregate Supplier Gradations

Coarseness Factor: **62** Workability Factor: **35**

Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.1	0.9	0.9
1"	80.8	18.2	19.2
3/4"	71.3	9.6	28.7
1/2"	64.0	7.3	36.0
3/8"	57.7	6.2	42.3
#4	42.8	15.0	57.2
#8	34.8	7.9	65.2
#16	28.4	6.4	71.6
#30	20.2	8.2	79.8
#50	7.6	12.6	92.4
#100	1.6	6.0	98.4
LBW	1.0	0.6	99.0

Coarseness Factor: **65** Workability Factor: **35**

PREPARED BY:  
SM, LLC Technical Service

Approved By: \_\_\_\_\_

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-32**

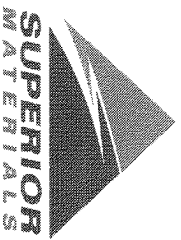
Sample Date: 10/5/20

Dates Test Represents: 10/6/2020 through 10/12/2020

Concrete Grade: **P1M**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



**Superior Materials, LLC**  
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Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
ZNS	95-013	Smelter Bay	1200	7.26	2.65	39.1
		<b>Total Wt</b>	<b>3070</b>	<b>18.70</b>		<b>100.0</b>

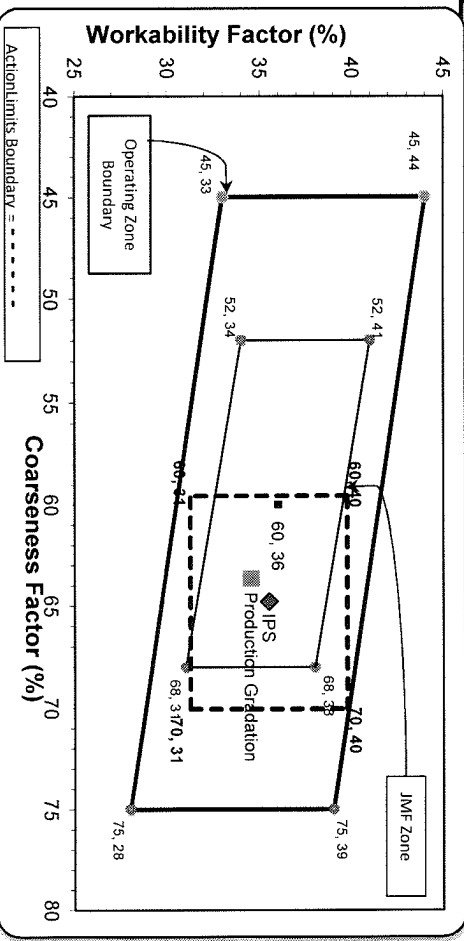
  

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.3	100.0	100.0	99.5	0.5	0.5
1"	41.1	100.0	100.0	81.8	17.7	18.2
3/4"	11.4	100.0	100.0	72.3	9.5	27.7
1/2"	3.7	83.9	100.0	65.4	6.9	34.6
3/8"	2.7	61.4	100.0	58.3	7.1	41.7
#4	1.8	15.8	95.0	42.4	15.9	57.6
#8	1.7	6.5	82.0	34.5	7.9	65.5
#16	1.6	4.5	64.5	27.1	7.5	72.9
#30	1.6	4.0	44.6	19.1	7.9	80.9
#50	1.6	3.7	20.2	9.5	9.6	90.5
#100	1.4	3.4	9.4	5.1	4.4	94.9
LBW	1.1	2.8	1.4	1.7	3.4	98.3

\*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 Gradations  Aggregate Supplier Gradations

Coarseness Factor: **64** Workability Factor: **35**



Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.0	0.6	0.6
1"	84.0	15.3	16.0
3/4"	73.5	10.5	26.5
1/2"	65.2	8.2	34.8
3/8"	58.2	7.1	41.8
#4	44.1	14.1	55.9
#8	35.5	8.6	64.5
#16	29.1	6.4	70.9
#30	21.9	7.3	78.1
#50	9.6	12.2	90.4
#100	2.6	7.1	97.4
LBW	1.0	1.6	99.0

Coarseness Factor: **65** Workability Factor: **36**

PREPARED BY:  
SM, LLC Technical Service

Approved By: \_\_\_\_\_

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-36**

Sample Date: 10/5/20

Dates Test Represents: 10/6/2020 through 10/12/2020

Concrete Grade: **P1M**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	900	5.50	2.62	29.3
NNS	63-92	Grange Hall	1200	7.26	2.65	39.1
		<b>Total Wt</b>	<b>3070</b>	<b>18.70</b>		<b>100.0</b>

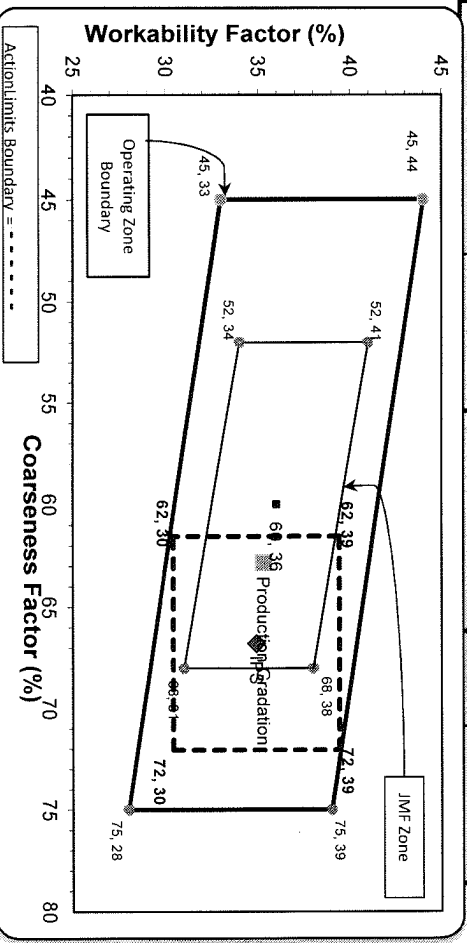
  

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.9	1.1	1.1
1"	42.6	100.0	100.0	81.9	17.0	18.1
3/4"	12.0	100.0	100.0	71.8	10.0	28.2
1/2"	5.3	98.7	100.0	65.5	6.3	34.5
3/8"	4.0	64.8	100.0	59.3	6.2	40.7
#4	2.6	18.4	97.4	44.3	15.1	55.7
#8	2.1	6.3	83.9	35.3	9.0	64.7
#16	1.9	3.8	68.4	28.5	6.9	71.5
#30	1.8	3.3	47.9	20.3	8.2	79.7
#50	1.7	3.0	18.5	8.6	11.6	91.4
#100	1.6	2.7	6.3	3.8	4.9	96.2
LBW	1.2	2.3	0.9	1.4	2.4	98.6

\*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. 1.5") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **63** Workability Factor: **35**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	67	35	0.0	0.0
1.5"			0.0	0.0
1"			85.0	15.0
3/4"			72.1	27.9
1/2"			64.5	35.5
3/8"			56.5	43.5
#4			42.7	57.3
#8			34.9	65.1
#16			29.0	71.0
#30			21.0	79.0
#50			8.2	91.8
#100			1.6	98.4
LBW			0.7	99.3

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