

# Aggregate Optimization Chart

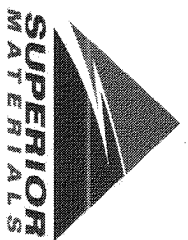
# Production Gradation Report

PLANT #: **P-32**

Sample Date: 12/21/20  
 Dates Test Represents: 12/22/2020 through 12/28/2020  
 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	820	5.02	2.62	26.7
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
<b>Total Wt:</b>			<b>3070</b>	<b>18.69</b>		<b>100.0</b>

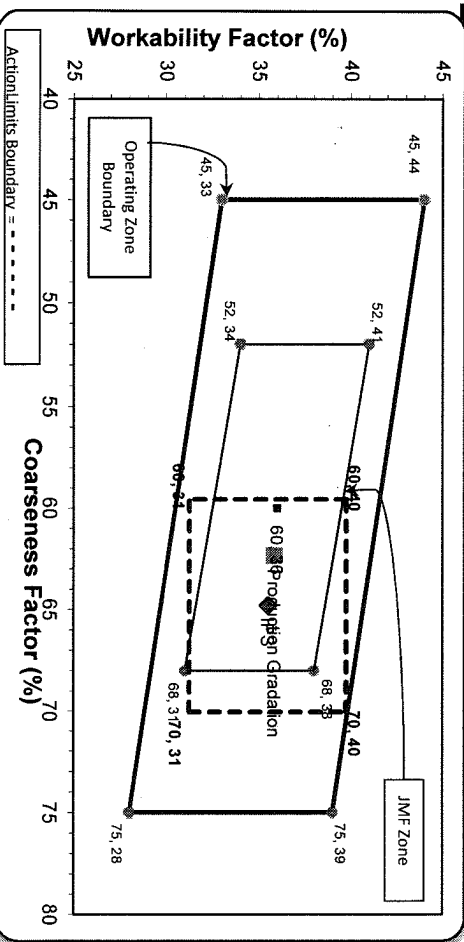
  

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.6	100.0	100.0	99.4	0.6	0.6
1"	40.8	100.0	100.0	84.2	15.2	15.8
3/4"	18.0	100.0	100.0	78.1	6.1	21.9
1/2"	5.9	81.1	100.0	68.7	9.4	31.3
3/8"	4.8	55.3	100.0	60.0	8.7	40.0
#4	2.9	11.2	96.1	43.6	16.5	56.4
#8	2.5	3.9	83.3	35.9	7.7	64.1
#16	2.2	2.6	66.9	28.7	7.2	71.3
#30	2.0	2.2	42.9	18.7	10.0	81.3
#50	1.8	2.2	22.1	10.2	8.5	89.8
#100	1.5	2.2	6.4	3.7	6.5	96.3
LBW	1.3	1.5	1.0	1.2	2.5	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  Batch Plant Gradations  Aggregate Supplier Gradations  
 Coarseness Factor: **62** Workability Factor: **36**

Initial Production Sample (IPS)  
 Coarseness Factor: **65** Workability Factor: **36**



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

PREPARED BY:  
 SM, LLC Technical Service

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

# Edw. C. Levy Co.

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 12/20/2020 - 12/26/2020

Report Date 12/24/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.6	%	
	1" (25mm)	40.8	%	
	3/4" (19mm)	18.0	%	
	1/2" (12.5mm)	5.9	%	
	3/8" (9.5mm)	4.8	%	
	#4 (4.75mm)	2.9	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	2.7	%	

# Edw. C. Levy Co.

Plant 958-JMT  
 Product 7920-INTERMED AGG P1M LS PI Name/Title Doug Storey / QC Technician  
 Period: 12/20/2020 - 12/26/2020 Report Date 12/24/2020

Procedure	Sieve/Test	Result	Unit	Intermed Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	100.0	%	
	1/2" (12.5mm)	81.1	%	
	3/8" (9.5mm)	55.3	%	
	#4 (4.75mm)	11.2	%	
	#8 (2.36mm)	3.9	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	3.5	%	

# Edw. C. Levy Co.

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 12/20/2020 - 12/26/2020

Report Date 12/24/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.1	%	95-100
	#8 (2.36mm)	83.3	%	65-95
	#16 (1.18mm)	66.9	%	35-75
	#30 (.6mm)	42.9	%	20-55
	#50 (.3mm)	22.1	%	10-30
	#100 (.15mm)	6.4	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75µm)	1.0	%	0-3
	Total Moisture	4.3	%	

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** P-101

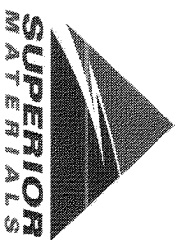
**Sample Date:** 12/21/20

**Dates Test Represents:** 12/22/2020 through 12/28/2020

**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	75-051	Mid-Michigan	1200	7.23	2.66	39.1
		<b>Total Wt</b>	<b>3070</b>	<b>18.67</b>		<b>100.0</b>

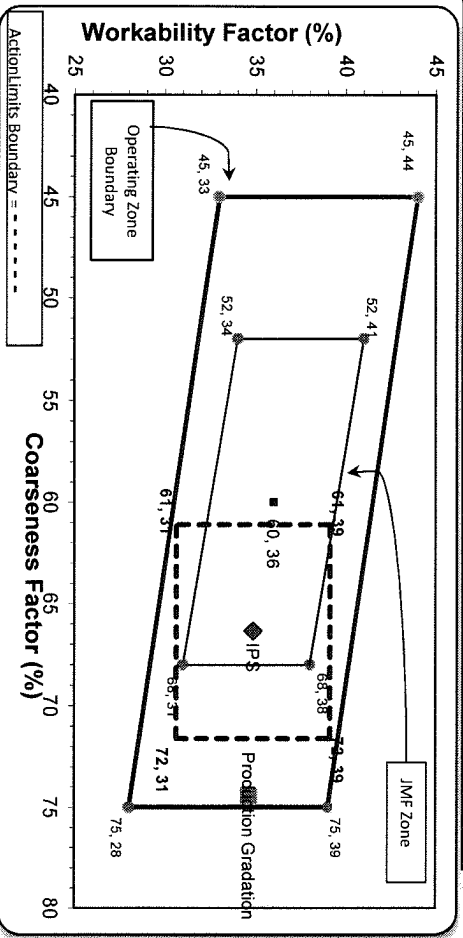
  

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	62.8	100.0	100.0	88.2	11.8	11.8
3/4"	13.8	95.2	100.0	71.4	16.9	28.6
1/2"	3.6	64.3	100.0	59.1	12.3	40.9
3/8"	3.0	38.6	100.0	51.4	7.7	48.6
#4	2.7	7.0	97.0	40.8	10.5	59.2
#8	2.6	3.9	83.6	34.6	6.2	65.4
#16	2.5	3.2	67.5	28.1	6.5	71.9
#30	2.4	2.9	50.1	21.2	6.9	78.8
#50	2.3	2.7	24.6	11.1	10.1	88.9
#100	2.0	2.5	5.2	3.4	7.7	96.6
LBW	1.5	1.8	1.0	1.4	2.0	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. Max. 1.5") aggregate is used.

**Production Gradation**     Batch Plant Gradations     Aggregate Supplier Gradations

**Coarseness Factor:** 74    **Workability Factor:** 35



**Initial Production Sample (IPS)**

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	84.3	15.3	15.7
3/4"	74.8	9.6	25.2
1/2"	64.3	10.4	35.7
3/8"	56.8	7.5	43.2
#4	43.0	13.8	57.0
#8	34.9	8.1	65.1
#16	26.4	8.5	73.6
#30	19.9	6.5	80.1
#50	10.4	9.5	89.6
#100	3.4	7.0	96.6
LBW	1.2	2.2	98.8

PREPARED BY:  
SM, LLC Technical Service

Approved By:



Plant S101-Superior Mount Clemens  
 Product 7919-COARSE AGG P1M LS  
 Period: 12/20/2020 - 12/26/2020

Name/Title Doug Storey / QC Technician  
 Report Date 12/24/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	62.8	%	
	3/4" (19mm)	13.8	%	
	1/2" (12.5mm)	3.6	%	
	3/8" (9.5mm)	3.0	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	3.01	%	



Plant S101-Superior Mount Clemens  
 Product 7920-INTERMED AGG P1M LS  
 Period: 12/20/2020 - 12/26/2020

Name/Title Doug Storey / QC Technician  
 Report Date 12/24/2020

Procedure	Sieve/Test	Result	Unit	Intermed Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	95.2	%	
	1/2" (12.5mm)	64.3	%	
	3/8" (9.5mm)	38.6	%	
	#4 (4.75mm)	7.0	%	
	#8 (2.36mm)	3.9	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.74	%	



**Plant** S101-Superior Mount Clemens

**Product** 1022-2NS GR

**Period:** 12/20/2020 - 12/26/2020

**Name/Title** Doug Storey / QC Technician

**Report Date** 12/24/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	83.6	%	65-95
	#16 (1.18mm)	67.5	%	35-75
	#30 (.6mm)	50.1	%	20-55
	#50 (.3mm)	24.6	%	10-30
	#100 (.15mm)	5.2	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.01	%	