

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-32**

Sample Date: **4/19/21**

Dates Test Represents: **4/20/2021** through **4/26/2021**

Concrete Grade: **P1M**

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

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



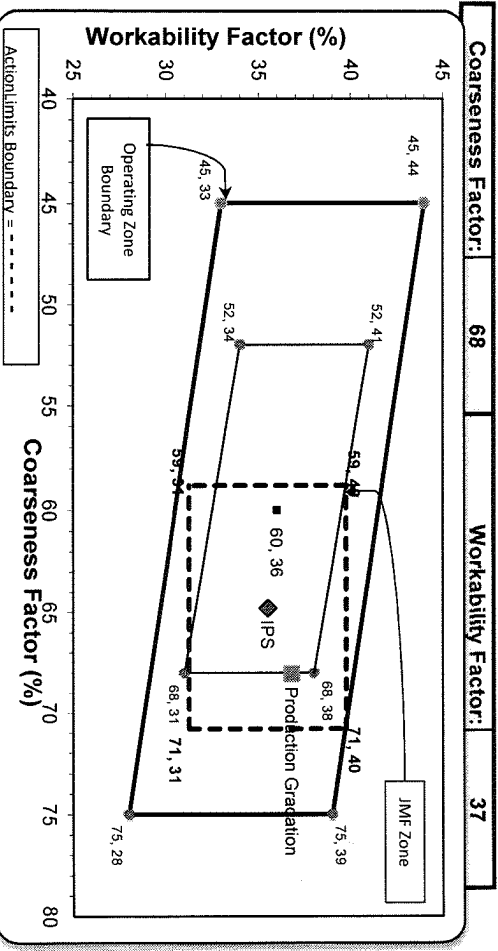
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (ssd)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
N2S	95-013	Smeiker 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	N2S	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.4	100.0	100.0	98.0	2.0	2.0
1"	39.5	100.0	100.0	78.9	19.1	21.1
3/4"	10.0	98.8	100.0	68.3	10.6	31.7
1/2"	3.5	84.3	100.0	62.5	5.8	37.5
3/8"	2.8	62.6	100.0	57.0	5.5	43.0
#4	2.5	14.8	96.5	43.8	13.2	56.2
#8	2.3	6.3	84.6	36.8	7.0	63.2
#16	2.2	3.9	68.4	29.6	7.2	70.4
#30	2.1	3.1	47.9	21.0	8.6	79.0
#50	2.1	2.7	20.5	9.7	11.3	90.3
#100	1.9	2.3	4.4	3.0	6.7	97.0
LBW	1.6	1.7	1.0	1.4	1.6	98.6

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Initial Production Sample (IPS)



Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	65	36	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: \_\_\_\_\_

**Plant** 958-JMT  
**Product** 1022-2NS GR - Smelter Bay  
**Period:** 04/18/2021 - 04/24/2021

**Name/Title** Doug Storey / QC Technician  
**Report Date** 04/23/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.5	%	95-100
	#8 (2.36mm)	84.6	%	65-95
	#16 (1.18mm)	68.4	%	35-75
	#30 (.6mm)	47.9	%	20-55
	#50 (.3mm)	20.5	%	10-30
	#100 (.15mm)	4.4	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.2	%	

Plant 958-JMT  
 Product 1067-26A Mod LS  
 Period: 04/18/2021 - 04/24/2021

Name/Title Doug Storey / QC Technician  
 Report Date 04/23/2021

Procedure	Sieve/Test	Result	Unit	26A Mod LS Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	100.0	%	100-100
	1/2" (12.5mm)	95.5	%	95-100
	3/8" (9.5mm)	83.6	%	60-95
	#4 (4.75mm)	29.3	%	5-30
	#8 (2.36mm)	10.2	%	0-12
	#16 (1.18mm)	4.8	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.6	%	

Plant 958-JMT  
 Product 1054-6AA LS PI  
 Period: 04/18/2021 - 04/24/2021

Name/Title Doug Storey / QC Technician  
 Report Date 04/23/2021

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.6	%	95-100
	3/4" (19mm)	88.1	%	
	1/2" (12.5mm)	38.6	%	30-60
	3/8" (9.5mm)	22.4	%	
	#4 (4.75mm)	5.4	%	0-8
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.8	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-36**

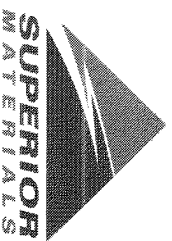
Sample Date: **4/19/21**

Dates Test Represents: **4/20/2021** through **4/26/2021**

Concrete Grade: **P1M**

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

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



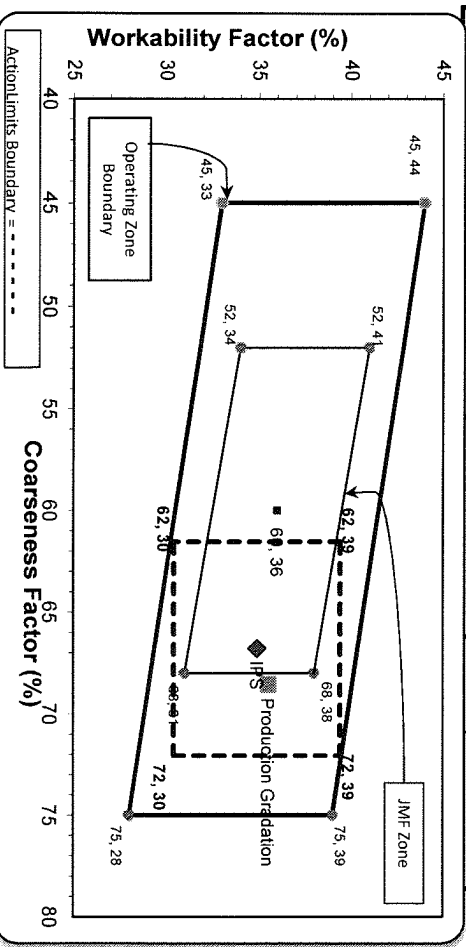
Superior Materials, LLC  
30701 W. 10 Mile Rd.  
Suite 500  
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	74.9	100.0	100.0	91.3	8.7	8.7
3/4"	29.0	99.7	100.0	75.2	16.1	24.8
1/2"	5.4	80.9	100.0	62.1	13.1	37.9
3/8"	4.0	58.8	100.0	55.8	6.2	44.2
#4	3.0	15.9	97.1	43.1	12.7	56.9
#8	2.6	5.8	84.7	35.5	7.6	64.5
#16	2.4	3.6	70.3	29.3	6.3	70.7
#30	2.3	3.2	53.0	22.4	6.9	77.6
#50	2.2	2.9	23.8	10.8	11.5	89.2
#100	2.0	2.7	3.5	2.8	8.1	97.2
LBW	1.8	2.3	0.4	1.4	1.4	98.6

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **69** Workability Factor: **36**



Initial Production Sample (IPS)

Coarseness Factor: **67** 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"	85.0	15.0	15.0
3/4"	72.1	12.9	27.9
1/2"	64.5	7.6	35.5
3/8"	56.5	8.0	43.5
#4	42.7	13.8	57.3
#8	34.9	7.8	65.1
#16	29.0	5.9	71.0
#30	21.0	8.0	79.0
#50	8.2	12.8	91.8
#100	1.6	6.5	98.4
LBW	0.7	0.9	99.3

\*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. 1.5") aggregate is used.

PREPARED BY:  
SM, LLC Technical Service

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



Superior Auburn Hills  
 2470 Auburn Road  
 Auburn Hills, MI 48432

**Plant** S36-Superior Auburn Hills

**Product** 1022-2NS GR

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

**Period:** 04/18/2021 - 04/24/2021

**Report Date** 04/23/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.1	%	95-100
	#8 (2.36mm)	84.7	%	65-95
	#16 (1.18mm)	70.3	%	35-75
	#30 (.6mm)	53.0	%	20-55
	#50 (.3mm)	23.8	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.68		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3
	Total Moisture	3.68	%	



Superior Auburn Hills  
 2470 Auburn Road  
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/18/2021 - 04/24/2021

Report Date 04/23/2021

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)	99.7	%	
	1/2" (12.5mm)	80.9	%	
	3/8" (9.5mm)	58.8	%	
	#4 (4.75mm)	15.9	%	
	#8 (2.36mm)	5.8	%	
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	3.2	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	2.35	%	



Superior Auburn Hills  
 2470 Auburn Road  
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills  
 Product 7919-COARSE AGG P1M LS  
 Period: 04/18/2021 - 04/24/2021

Name/Title Doug Storey / QC Technician  
 Report Date 04/23/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	74.9	%	
	3/4" (19mm)	29.0	%	
	1/2" (12.5mm)	5.4	%	
	3/8" (9.5mm)	4.0	%	
	#4 (4.75mm)	3.0	%	
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	1.63	%	