

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-32**

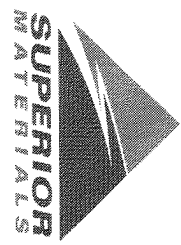
Sample Date: **6/8/20**

Dates Test Represents: **6/9/2020** through **6/15/2020**

Concrete Grade: **S2M**

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

MIDOT No.: \_\_\_\_\_



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

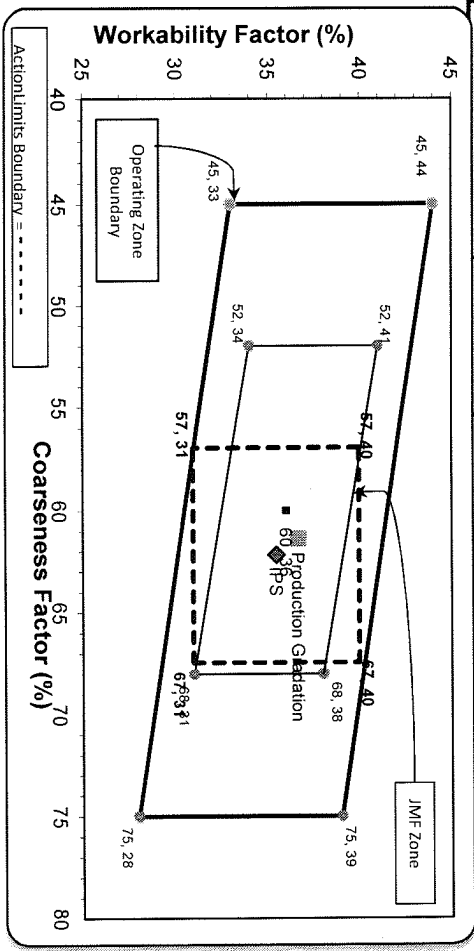
Aggr. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1520	9.30	2.62	49.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
		<b>Total Wt</b>	<b>3050</b>	<b>18.57</b>		<b>100.0</b>

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"	95.8	100.0	100.0	97.9	2.1	2.1
3/4"	78.9	100.0	100.0	89.5	8.4	10.5
1/2"	42.9	97.7	100.0	71.3	18.2	28.7
3/8"	24.9	85.1	100.0	61.1	10.2	38.9
#4	5.2	26.0	97.1	44.3	16.8	55.7
#8	2.6	8.9	85.5	36.7	7.7	63.3
#16	2.2	4.9	70.1	29.8	6.8	70.2
#30	2.0	3.9	49.2	21.2	8.6	78.8
#50	1.9	3.6	21.6	10.0	11.2	90.0
#100	1.8	3.3	6.2	3.7	6.3	96.3
LBW	1.5	2.7	1.6	1.7	2.1	98.3

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **61** Workability Factor: **37**



Initial Production Sample (IPS)

Coarseness Factor:	62		
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"	94.0	6.0	6.0
1/2"	70.2	23.7	29.8
3/8"	59.9	10.4	40.1
#4	42.7	17.2	57.3
#8	35.5	7.2	64.5
#16	28.4	7.0	71.6
#30	19.2	9.2	80.8
#50	8.9	10.3	91.1
#100	3.1	5.9	96.9
LBW	1.4	1.7	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.

PREPARED BY:  
SM, LLC Technical Service

Approved By:

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 06/07/2020 - 06/13/2020

Report Date 06/11/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	95.8	%	95-100
	3/4" (19mm)	78.9	%	
	1/2" (12.5mm)	42.9	%	30-60
	3/8" (9.5mm)	24.9	%	
	#4 (4.75mm)	5.2	%	0-8
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.6	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 06/07/2020 - 06/13/2020

Report Date 06/12/2020

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)	97.7	%	95-100
	3/8" (9.5mm)	85.1	%	60-95
	#4 (4.75mm)	26.0	%	5-30
	#8 (2.36mm)	8.9	%	0-12
	#16 (1.18mm)	4.9	%	
	#30 (.6mm)	3.9	%	
	#50 (.3mm)	3.6	%	
	#100 (.15mm)	3.3	%	
	#200 (75µm)	2.7	%	
	Wash Loss (#200/75um)	2.6	%	0-3
	Total Moisture	2.5	%	

**Plant** 958-JMT

**Product** 1022-2NS GR - Smelter Bay

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

**Period:** 06/07/2020 - 06/13/2020

**Report Date** 06/11/2020

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)	85.5	%	65-95
	#16 (1.18mm)	70.1	%	35-75
	#30 (.6mm)	49.2	%	20-55
	#50 (.3mm)	21.6	%	10-30
	#100 (.15mm)	6.2	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.5	%	

# Aggregate Optimization Chart

## Production Gradation Report

PLANT #: **P-36**

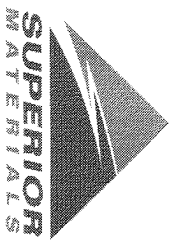
Sample Date: **6/8/20**

Dates Test Represents: **6/9/2020** through **6/15/2020**

Concrete Grade: **S2M**

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
6AA	71-47	Presque Isle	1500	9.17	2.62	49.2
26A	71-47	Presque Isle	350	2.14	2.62	11.5
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
<b>Total Wt</b>			<b>3050</b>	<b>18.57</b>		<b>100.0</b>

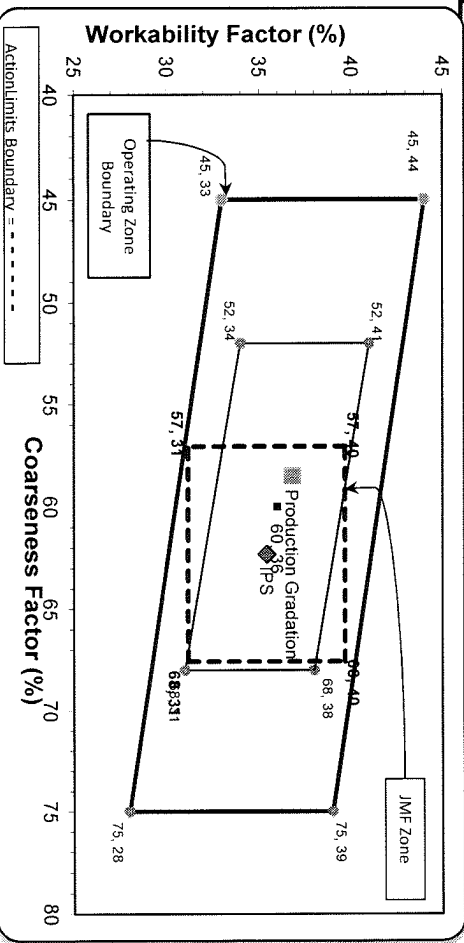
  

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.1	100.0	100.0	99.1	0.9	0.9
3/4"	79.6	100.0	100.0	90.0	9.1	10.0
1/2"	47.5	96.0	100.0	73.7	16.2	26.3
3/8"	28.6	83.9	100.0	63.0	10.7	37.0
#4	6.3	27.3	97.8	44.7	18.3	55.3
#8	3.2	9.1	86.9	36.8	7.9	63.2
#16	2.7	4.5	73.0	30.6	6.2	69.4
#30	2.5	3.7	48.4	20.7	9.9	79.3
#50	2.4	3.3	17.4	8.4	12.3	91.6
#100	2.1	3.0	2.5	2.4	6.0	97.6
LBW	1.7	2.5	0.7	1.4	1.0	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: **58** Workability Factor: **37**



Initial Production Sample (IPPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	62	35	0.0	0.0
1.5"			0.0	0.0
1"			0.9	0.9
3/4"			8.6	9.5
1/2"			20.7	30.2
3/8"			10.0	40.2
#4			17.6	57.8
#8			6.7	64.6
#16			6.7	71.2
#30			7.4	78.6
#50			12.6	91.2
#100			7.0	98.2
LBW			1.0	99.3

PREPARED BY:  
SM, LLC Technical Service

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



Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 06/07/2020 - 06/13/2020

Report Date 06/11/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.1	%	95-100
	3/4" (19mm)	79.6	%	
	1/2" (12.5mm)	47.5	%	30-60
	3/8" (9.5mm)	28.6	%	
	#4 (4.75mm)	6.3	%	0-8
	#8 (2.36mm)	3.2	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	3.86	%	
AASHTO T11	-#200 (75um)	1.72	%	



Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 06/07/2020 - 06/13/2020

Report Date 06/11/2020

Procedure	Sieve/Test	Result	Unit	26A 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)	96.0	%	95-100
	3/8" (9.5mm)	83.9	%	60-95
	#4 (4.75mm)	27.3	%	5-30
	#8 (2.36mm)	9.1	%	0-12
	#16 (1.18mm)	4.5	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.3	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.5	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	2.73	%	



2470 Auburn Road  
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/07/2020 - 06/13/2020

Report Date 06/11/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.8	%	95-100
	#8 (2.36mm)	86.9	%	65-95
	#16 (1.18mm)	73.0	%	35-75
	#30 (.6mm)	48.4	%	20-55
	#50 (.3mm)	17.4	%	10-30
	#100 (.15mm)	2.5	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3
	Total Moisture	3.56	%	