

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** P-32

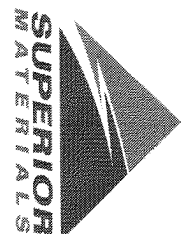
**Sample Date:** 4/13/20

**Dates Test Represents:** 4/14/2020 through 4/20/2020

**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	1370	8.38	2.62	44.9
26A	71-47	Presque Isle	400	2.45	2.62	13.1
2NS	63-115	Ray Rd	1280	7.74	2.65	42.0
<b>Total Wt</b>			<b>3050</b>	<b>18.57</b>		<b>100.0</b>

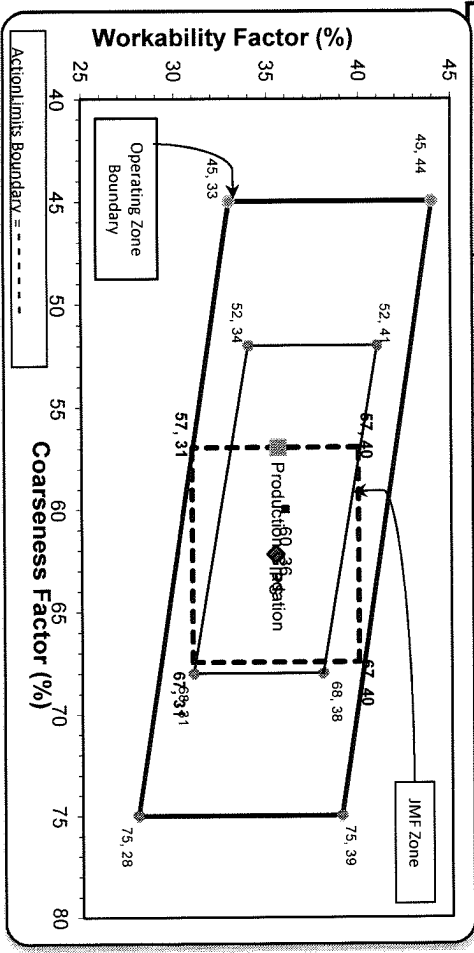
  

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	96.7	100.0	100.0	98.5	1.5	1.5
3/4"	77.9	100.0	100.0	90.1	8.4	9.9
1/2"	39.0	97.8	100.0	72.3	17.8	27.7
3/8"	21.7	88.5	100.0	63.3	9.0	36.7
#4	4.6	25.5	95.1	45.3	18.0	54.7
#8	2.9	7.5	79.4	35.6	9.7	64.4
#16	2.6	4.0	63.6	28.4	7.2	71.6
#30	2.5	3.5	47.2	21.4	7.0	78.6
#50	2.3	3.2	20.8	10.2	11.2	89.8
#100	2.1	2.9	4.1	3.0	7.1	97.0
LBW	1.7	2.5	0.8	1.4	1.6	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:** 57 **Workability Factor:** 36



**Initial Production Sample (IPS)**

Sieve	% 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

PREPARED BY:  
SM, LLC Technical Service

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

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 04/12/2020 - 04/18/2020

Report Date 04/17/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.7	%	95-100
	3/4" (19mm)	77.9	%	
	1/2" (12.5mm)	39.0	%	30-60
	3/8" (9.5mm)	21.7	%	
	#4 (4.75mm)	4.6	%	0-8
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	3.1	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/12/2020 - 04/18/2020

Report Date 04/17/2020

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)	97.8	%	95-100
	3/8" (9.5mm)	88.5	%	60-95
	#4 (4.75mm)	25.5	%	5-30
	#8 (2.36mm)	7.5	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.5	%	
	Wash Loss (#200/75µm)	2.5	%	0-3
	Total Moisture	4.5	%	

# Edw. C. Levy Co.

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Detroit, 48209  
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Plant 958-JMT

Product 1022-2NS GR

Period: 04/12/2020 - 04/18/2020

Name/Title Doug Storey / QC Technician

Report Date 04/17/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.1	%	95-100
	#8 (2.36mm)	79.4	%	65-95
	#16 (1.18mm)	63.6	%	35-75
	#30 (.6mm)	47.2	%	20-55
	#50 (.3mm)	20.8	%	10-30
	#100 (.15mm)	4.1	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.90		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	4.6	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-36**

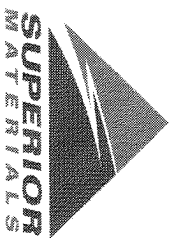
Sample Date: **4/13/20**

Dates Test Represents: **4/14/2020** through **4/20/2020**

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	1450	8.87	2.62	47.5	
26A	71-47	Presque Isle	400	2.45	2.62	13.1	
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3	
<b>Total Wt</b>						<b>3050</b>	<b>100.0</b>

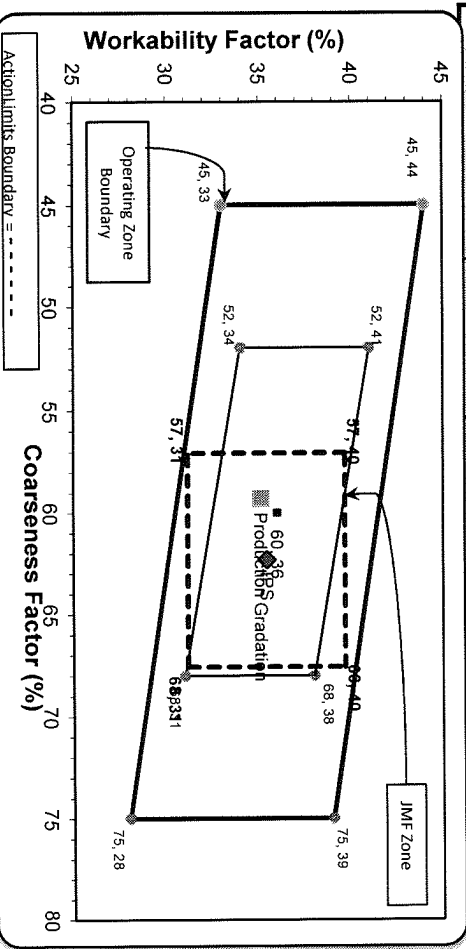
  

Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	77.7	100.0	100.0	89.4	10.3	10.6
1/2"	41.2	97.3	100.0	71.7	17.7	28.3
3/8"	22.7	86.9	100.0	61.5	10.2	38.5
#4	3.6	22.9	97.0	42.9	18.7	57.1
#8	2.1	6.1	84.7	35.1	7.8	64.9
#16	1.9	3.4	70.3	29.0	6.1	71.0
#30	1.8	3.0	52.7	22.0	7.0	78.0
#50	1.7	2.8	25.2	11.1	10.9	88.9
#100	1.6	2.7	5.0	3.1	8.0	96.9
LBW	1.4	2.3	0.5	1.2	1.9	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: **59** Workability Factor: **35**



Initial Production Sample (IPS)

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: \_\_\_\_\_



2470 Auburn Road  
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 04/12/2020 - 04/18/2020

Report Date 04/17/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.4	%	95-100
	3/4" (19mm)	77.7	%	
	1/2" (12.5mm)	41.2	%	30-60
	3/8" (9.5mm)	22.7	%	
	#4 (4.75mm)	3.6	%	0-8
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.46	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.14	%	



2470 Auburn Road  
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills  
Product 1067-26A Mod LS  
Period: 04/12/2020 - 04/18/2020

Name/Title Doug Storey / QC Technician  
Report Date 04/17/2020

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)	97.3	%	95-100
	3/8" (9.5mm)	86.9	%	60-95
	#4 (4.75mm)	22.9	%	5-30
	#8 (2.36mm)	6.1	%	0-12
	#16 (1.18mm)	3.4	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.5	%	
	Wash Loss (#200/75µm)	2.3	%	0-3
	Total Moisture	5.86	%	



2470 Auburn Road  
Auburn Hills, MI 48432

**Plant** S36-Superior Auburn Hills

**Product** 1022-2NS GR

**Period:** 04/12/2020 - 04/18/2020

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

**Report Date** 04/17/2020

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)	84.7	%	65-95
	#16 (1.18mm)	70.3	%	35-75
	#30 (.6mm)	52.7	%	20-55
	#50 (.3mm)	25.2	%	10-30
	#100 (.15mm)	5.0	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.60	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-39**

Sample Date: **4/13/20**

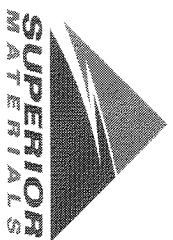
Dates Test Represents: **4/14/2020**

through **4/20/2020**

Concrete Grade: **S2M**

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

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



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

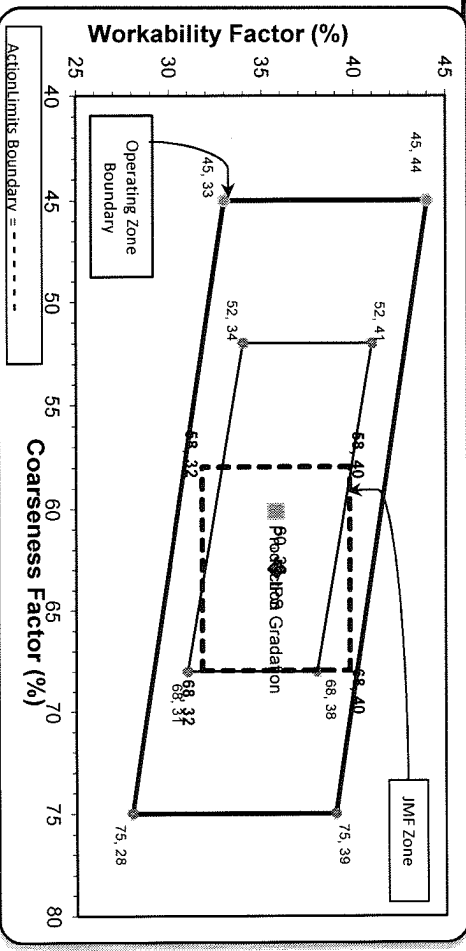
Aggr. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	% Contribution	
6AA	71-47	Presque Isle	1700	10.40	2.62	55.7	
26A	71-47	Presque Isle	150	0.92	2.62	4.9	
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3	
<b>Total Wt</b>						<b>3050</b>	<b>100.0</b>

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"	98.3	100.0	100.0	99.1	0.9	0.9
3/4"	89.1	100.0	100.0	93.9	5.1	6.1
1/2"	53.4	98.4	100.0	73.9	20.0	26.1
3/8"	31.8	87.7	100.0	61.4	12.6	38.6
#4	5.5	23.3	98.1	42.8	18.6	57.2
#8	2.9	7.3	85.9	35.8	7.0	64.2
#16	2.6	4.0	71.0	29.6	6.2	70.4
#30	2.5	3.3	52.0	22.0	7.6	78.0
#50	2.4	3.1	22.6	10.4	11.6	89.6
#100	2.3	2.9	3.8	2.9	7.5	97.1
LBW	1.9	2.5	0.8	1.5	1.4	98.5

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **60** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.9	0.9
3/4"	5.1	6.1
1/2"	20.0	26.1
3/8"	12.6	38.6
#4	18.6	57.2
#8	7.0	64.2
#16	6.2	70.4
#30	7.6	78.0
#50	11.6	89.6
#100	7.5	97.1
LBW	1.4	98.5

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.0	0.0
3/4"	0.2	10.2
1/2"	7.7	29.3
3/8"	19.1	40.4
#4	11.1	56.8
#8	7.4	64.2
#16	6.6	70.8
#30	7.8	78.6
#50	11.6	90.2
#100	6.1	96.3
LBW	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. 1.5") aggregate is used.

PREPARED BY:  
SM, LLC Technical Service

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



Plant S39-Superior Sterling Heights

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 04/12/2020 - 04/18/2020

Report Date 04/17/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.3	%	95-100
	3/4" (19mm)	89.1	%	
	1/2" (12.5mm)	53.4	%	30-60
	3/8" (9.5mm)	31.8	%	
	#4 (4.75mm)	5.5	%	0-8
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.08	%	
	Wash Loss (#200/75µm)	1.9	%	0-2
	Total Moisture	3.11	%	



Plant S39-Superior Sterling Heights  
 Product 1067-26A Mod LS  
 Period: 04/12/2020 - 04/18/2020

Name/Title Doug Storey / QC Technician  
 Report Date 04/17/2020

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)	98.4	%	95-100
	3/8" (9.5mm)	87.7	%	60-95
	#4 (4.75mm)	23.3	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75µm)	2.5	%	0-3
	Total Moisture	3.29	%	



**Plant** S39-Superior Sterling Heights

**Product** 1022-2NS GR

**Period:** 04/12/2020 - 04/18/2020

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

**Report Date** 04/17/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.1	%	95-100
	#8 (2.36mm)	85.9	%	65-95
	#16 (1.18mm)	71.0	%	35-75
	#30 (.6mm)	52.0	%	20-55
	#50 (.3mm)	22.6	%	10-30
	#100 (.15mm)	3.8	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	4.14	%	