

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-32**

Sample Date: **6/13/22**

Dates Test Represents: **6/14/2022** through **6/20/2022**

Concrete Grade: **P1M, 3500HP**

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



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

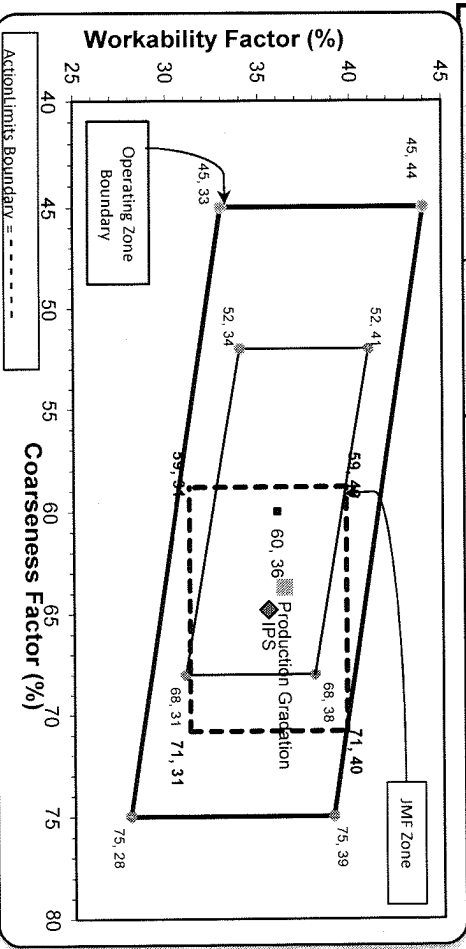
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	900	5.50	2.62	29.3
IA	71-47	Presque Isle	920	5.63	2.62	30.0
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		<b>Total Wt</b>	<b>3070</b>			<b>100.0</b>

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.9	100.0	100.0	98.5	1.5	1.5
1"	50.8	100.0	100.0	85.6	12.9	14.4
3/4"	16.3	96.9	100.0	74.5	11.0	25.5
1/2"	5.7	79.7	100.0	66.3	8.3	33.7
3/8"	3.7	58.9	100.0	59.5	6.8	40.5
#4	2.7	17.9	95.5	45.0	14.4	55.0
#8	2.5	6.3	82.9	36.4	8.7	63.6
#16	2.4	3.6	68.2	29.6	6.8	70.4
#30	2.3	2.9	48.9	21.5	8.1	78.5
#50	2.2	2.6	23.6	11.0	10.4	89.0
#100	2.0	2.2	6.4	3.9	7.2	96.1
LBW	1.5	1.6	0.6	1.2	2.7	98.8

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **64** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	65	36	0.0	0.0
1.5"			0.6	0.6
1"			15.3	16.0
3/4"			10.5	26.5
1/2"			8.2	34.8
3/8"			7.1	41.8
#4			14.1	55.9
#8			8.6	64.5
#16			6.4	70.9
#30			7.3	78.1
#50			12.2	90.4
#100			7.1	97.4
LBW			1.6	99.0

\*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.

PREPARED BY:  
SM, LLC Technical Service

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

Plant 958-JMT  
 Product 1022-2NS GR - Smelter Bay  
 Period: 06/12/2022 - 06/18/2022

Name/Title Doug Storey / QC Technician  
 Report Date 06/17/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.5	%	95-100
	#8 (2.36mm)	82.9	%	65-95
	#16 (1.18mm)	68.2	%	35-75
	#30 (.6mm)	48.9	%	20-55
	#50 (.3mm)	23.6	%	10-30
	#100 (.15mm)	6.4	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	4.4	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 06/12/2022 - 06/18/2022

Report Date 06/17/2022

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)	96.9	%	
	1/2" (12.5mm)	79.7	%	
	3/8" (9.5mm)	58.9	%	
	#4 (4.75mm)	17.9	%	
	#8 (2.36mm)	6.3	%	
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	4.2	%	

# Edw. C. Levy Co.

JMT  
 8911 W. Jefferson  
 Detroit, 48209  
 (313) 429-2429

**Plant** 958-JMT

**Product** 7919-COARSE AGG P1M LS PI

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

**Period:** 06/12/2022 - 06/18/2022

**Report Date** 06/17/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.9	%	
	1" (25mm)	50.8	%	
	3/4" (19mm)	16.3	%	
	1/2" (12.5mm)	5.7	%	
	3/8" (9.5mm)	3.7	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	1.5	%	

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** P-35

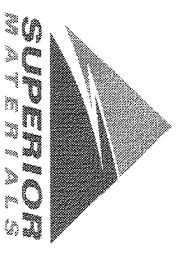
**Sample Date:** 6/13/22

**Dates Test Represents:** 6/14/2022 through 6/20/2022

**Concrete Grade:** P1M, 3500HP

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

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



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

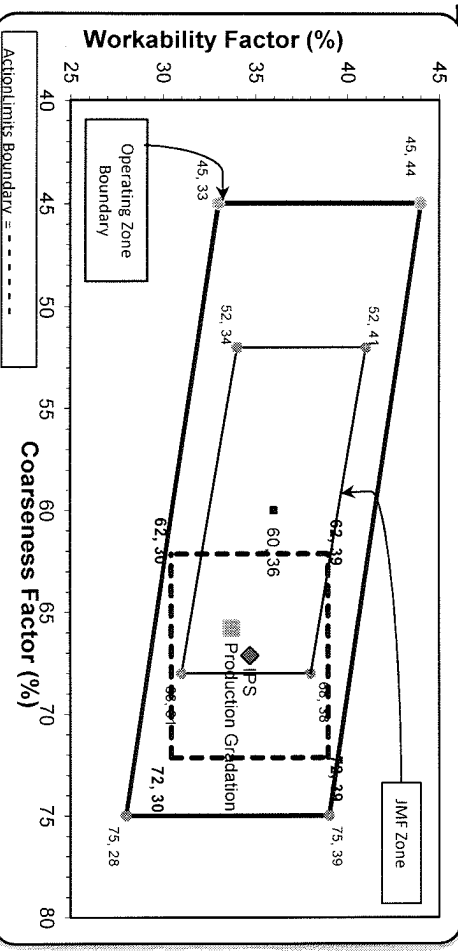
Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
NNS	81-019	Pleasant Lake	1200	7.26	2.65	38.5
<b>Total Wt</b>			<b>3120</b>	<b>18.70</b>		<b>100.0</b>

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"	61.5	100.0	100.0	83.1	16.9	16.9
3/4"	24.7	100.0	100.0	66.9	33.1	50.0
1/2"	11.6	95.0	100.0	60.3	39.7	89.7
3/8"	8.5	80.5	100.0	56.4	43.6	93.3
#4	2.7	24.6	99.4	43.8	56.2	99.5
#8	1.8	7.4	82.2	33.7	66.3	99.8
#16	1.5	3.8	64.6	26.2	73.8	99.9
#30	1.3	2.6	47.0	19.1	80.9	99.9
#50	1.2	2.2	23.5	10.0	90.0	99.9
#100	1.1	1.9	7.0	3.5	96.5	99.9
LBW	0.9	1.6	1.5	1.3	98.7	99.9

\*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:** 66 **Workability Factor:** 34



**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"			13.1	13.1
3/4"			10.8	23.9
1/2"			12.4	36.3
3/8"			7.5	43.8
#4			13.0	56.8
#8			8.5	65.3
#16			7.2	72.5
#30			7.0	79.4
#50			11.6	91.0
#100			6.9	97.9
LBW			1.1	99.0

PREPARED BY:  
SM, LLC Technical Service

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



Plant S35-Superior Romulus

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/12/2022 - 06/18/2022

Report Date 06/17/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.4	%	95-100
	#8 (2.36mm)	82.2	%	65-95
	#16 (1.18mm)	64.6	%	35-75
	#30 (.6mm)	47.0	%	20-55
	#50 (.3mm)	23.5	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.76		2.6-3
AASHTO T11	#200 (75um)	2.02	%	
	Wash Loss (#200/75um)	1.5	%	0-3
ASTM C566	Total Moisture	5.50	%	



Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/12/2022 - 06/18/2022

Report Date 06/17/2022

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)	100.0	%	
	1/2" (12.5mm)	95.0	%	
	3/8" (9.5mm)	80.5	%	
	#4 (4.75mm)	24.6	%	
	#8 (2.36mm)	7.4	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-3
ASTM C566	Total Moisture	3.60	%	



**Plant** S35-Superior Romulus

**Product** 7919-COARSE AGG P1M LS

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

**Period:** 06/12/2022 - 06/18/2022

**Report Date** 06/17/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	61.5	%	
	3/4" (19mm)	24.7	%	
	1/2" (12.5mm)	11.6	%	
	3/8" (9.5mm)	8.5	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.3	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	1.0	%	
	Wash Loss (#200/75µm)	0.9	%	0-2
ASTM C566	Total Moisture	2.35	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-39**

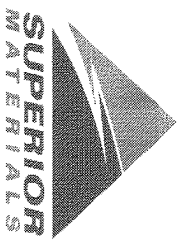
Sample Date: **6/13/22**

Dates Test Represents: **6/14/2022** through **6/20/2022**

Concrete Grade: **P1M, 3500HP**

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

MIDOT 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	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	800	4.89	2.62	26.1
NNS	44-051	Krake Willis Rd	1250	7.56	2.65	40.7
Total Wt:			<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"	93.8	100.0	100.0	97.9	2.1	2.1
1"	43.8	100.0	100.0	81.3	16.6	18.7
3/4"	12.8	98.2	100.0	70.6	10.8	29.4
1/2"	4.3	78.6	100.0	62.6	7.9	37.4
3/8"	2.3	59.9	100.0	57.1	5.5	42.9
#4	1.8	21.9	96.4	45.6	11.5	54.4
#8	1.8	9.3	79.6	35.4	10.1	64.6
#16	1.7	6.0	64.5	28.4	7.0	71.6
#30	1.7	5.1	46.7	20.9	7.5	79.1
#50	1.7	4.7	22.8	11.1	9.8	88.9
#100	1.6	4.2	8.2	5.0	6.1	95.0
LBW	1.2	3.0	1.7	1.9	3.1	98.1

Verify this number is 100%

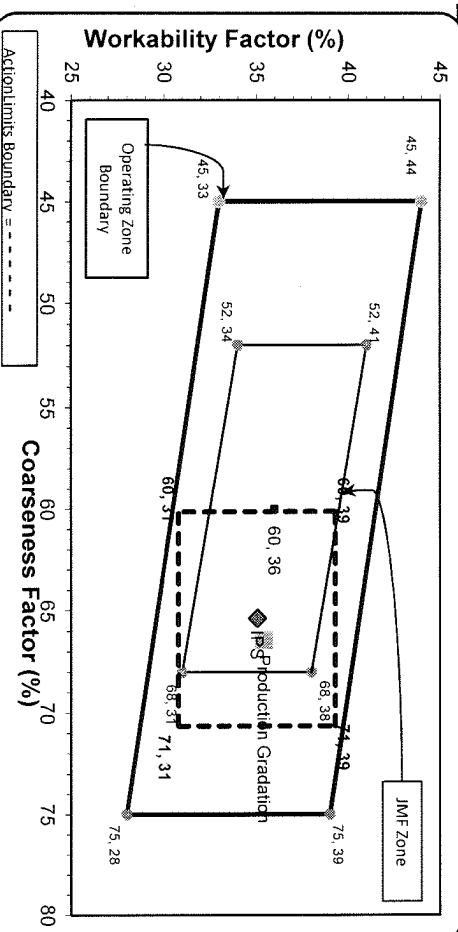
\*Maximum % Retained must be above the 3/8" sieve.  
\*Any two adjacent sieves must equal 10% except max.  
nom. max. #100 and #200 sieves.  
\*% Retained must be at least 4% for each sieve except max.  
nom. max. #100 and #200 sieves.  
\*% Retained must be at least 8% for the 1" sieve when  
a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **66** Workability Factor: **35**

Initial Production Sample (IPS)

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



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.1	9.8	25.9
1/2"	64.3	9.7	35.7
3/8"	57.5	6.8	42.5
#4	44.5	13.1	55.5
#8	35.1	9.4	64.9
#16	27.9	7.2	72.1
#30	21.7	6.2	78.3
#50	12.6	9.1	87.4
#100	3.5	9.1	96.5
LBW	1.2	2.4	98.8

PREPARED BY:  
SM, LLC Technical Service

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



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/12/2022 - 06/18/2022

Report Date 06/17/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	79.6	%	65-95
	#16 (1.18mm)	64.5	%	35-75
	#30 (.6mm)	46.7	%	20-55
	#50 (.3mm)	22.8	%	10-30
	#100 (.15mm)	8.2	%	0-10
	#200 (75µm)	2.2	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	3.30	%	



Plant S39-Superior Sterling Heights

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/12/2022 - 06/18/2022

Report Date 06/17/2022

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)	98.2	%	
	1/2" (12.5mm)	78.6	%	
	3/8" (9.5mm)	59.9	%	
	#4 (4.75mm)	21.9	%	
	#8 (2.36mm)	9.3	%	
	#16 (1.18mm)	6.0	%	
	#30 (.6mm)	5.1	%	
	#50 (.3mm)	4.7	%	
	#100 (.15mm)	4.2	%	
	#200 (75µm)	3.4	%	
	Wash Loss (#200/75um)	3.0	%	0-3
	Total Moisture	3.75	%	



**Plant** S39-Superior Sterling Heights

**Product** 7919-COARSE AGG P1M LS

**Period:** 06/12/2022 - 06/18/2022

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

**Report Date** 06/17/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	93.8	%	
	1" (25mm)	43.8	%	
	3/4" (19mm)	12.8	%	
	1/2" (12.5mm)	4.3	%	
	3/8" (9.5mm)	2.3	%	
	#4 (4.75mm)	1.8	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	0.59	%	