

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P11**

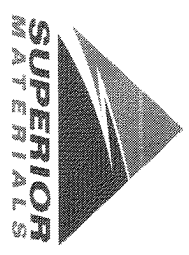
Sample Date: **4/15/24**

Dates Test Represents: **4/16/2024** through **4/22/2024**

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)	# <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	890	5.44	2.62	29.0
IA	71-47	Presque Isle	980	5.99	2.62	31.9
2NS	95-013	Smelter Bay	1200	7.26	2.65	39.1
		<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"	98.3	100.0	100.0	99.5	0.5	0.5
1"	40.4	100.0	100.0	82.7	16.8	17.3
3/4"	9.3	98.0	100.0	73.1	9.7	26.9
1/2"	3.1	100.0	100.0	62.6	10.4	37.4
3/8"	2.6	45.0	100.0	54.2	8.4	45.8
#4	2.2	8.6	97.1	41.3	12.9	58.7
#8	2.0	3.7	85.3	35.1	6.2	64.9
#16	1.9	3.0	70.6	29.1	6.0	70.9
#30	1.7	2.8	50.8	21.2	7.9	78.8
#50	1.5	2.6	24.1	10.7	10.6	89.3
#100	1.3	2.5	7.3	4.0	6.7	96.0
LBW	1.0	2.2	1.3	1.5	2.5	98.5

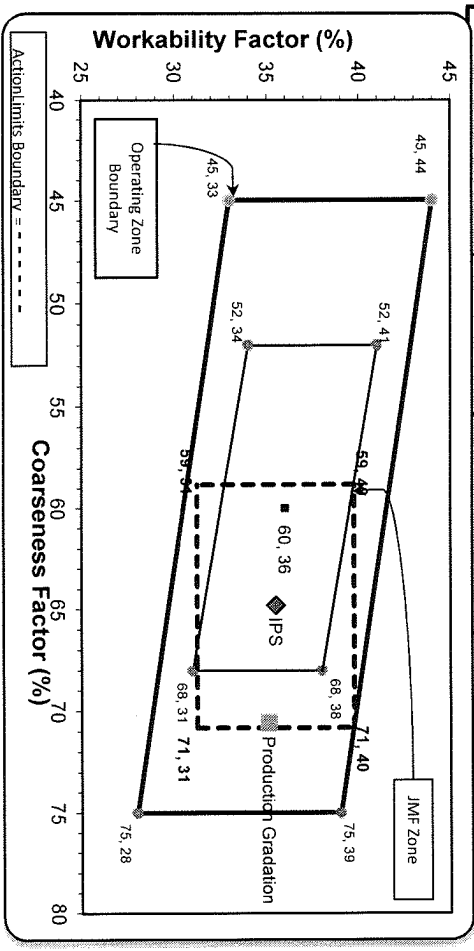
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 norm. max., #100 and #200 sieves.  
 \*\*% Retained must be at least 4% for each sieve except max.  
 norm. max., #100 and #200 sieves.  
 \*\*\*% Retained must be at least 8% for the 1" sieve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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **71** Workability Factor: **35**

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: \_\_\_\_\_



**Plant** S11-Onsite Jefferson

**Product** 7919-COARSE AGG P1M LS

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

**Period:** 04/14/2024 - 04/20/2024

**Report Date** 04/19/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.3	%	
	1" (25mm)	40.4	%	
	3/4" (19mm)	9.3	%	
	1/2" (12.5mm)	3.1	%	
	3/8" (9.5mm)	2.6	%	
	#4 (4.75mm)	2.2	%	
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	1.01	%	



Plant S11-Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	98.0	%	
	1/2" (12.5mm)	70.9	%	
	3/8" (9.5mm)	45.0	%	
	#4 (4.75mm)	8.6	%	
	#8 (2.36mm)	3.7	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	2.61	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	85.3	%	65-95
	#16 (1.18mm)	70.6	%	35-75
	#30 (.6mm)	50.8	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	5.63	%	

# Aggregate Optimization Chart

# Production Gradation Report

**PLANT #:** 12

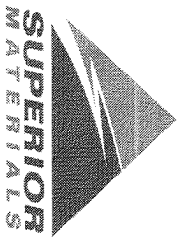
Sample Date: 4/15/24

Dates Test Represents: 4/16/2024 through 4/22/2024

Concrete Grade: P1M, 3500HP

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

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



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

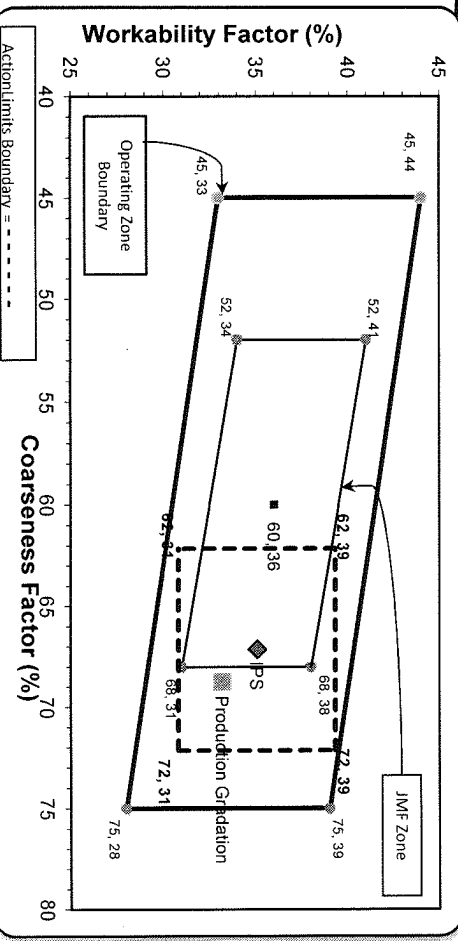
Aggr. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	63-115	Ray Rd	1200	7.26	2.65	39.1
		<b>Total Wt</b>	<b>3070</b>	<b>18.70</b>		<b>100.0</b>

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.9	100.0	100.0	98.6	1.4	1.4
1"	36.3	100.0	100.0	77.8	20.8	22.2
3/4"	8.0	98.8	100.0	67.6	10.2	32.4
1/2"	2.4	80.7	100.0	61.0	6.7	39.0
3/8"	2.1	54.7	100.0	54.1	6.9	45.9
#4	2.0	10.1	96.8	41.2	12.9	58.8
#8	2.0	3.5	80.8	33.2	8.0	66.8
#16	1.9	2.7	64.2	26.5	6.7	73.5
#30	1.9	2.4	47.4	19.8	6.6	80.2
#50	1.8	2.3	21.9	9.8	10.0	90.2
#100	1.7	2.2	3.2	2.4	7.4	97.6
LBW	1.3	1.9	0.5	1.1	1.3	98.9

\*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: 69 Workability Factor: 33



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"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.0	9.8	26.0
1/2"	63.7	10.3	36.3
3/8"	56.4	7.3	43.6
#4	43.0	13.4	57.0
#8	35.1	7.9	64.9
#16	29.0	6.1	71.0
#30	20.9	8.0	79.1
#50	8.1	12.8	91.9
#100	1.6	6.5	98.4
LBW	0.9	0.8	99.1

PREPARED BY:  
SM, LLC Technical Service

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



Plant S12-Onsite Southfield

**Product** 7919-COARSE AGG P1M LS

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

**Period:** 04/14/2024 - 04/20/2024

**Report Date** 04/19/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	95.9	%	
	1" (25mm)	36.3	%	
	3/4" (19mm)	8.0	%	
	1/2" (12.5mm)	2.4	%	
	3/8" (9.5mm)	2.1	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	0.46	%	



Plant S12-Onsite Southfield

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/19/2024

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)	98.8	%	
	1/2" (12.5mm)	80.7	%	
	3/8" (9.5mm)	54.7	%	
	#4 (4.75mm)	10.1	%	
	#8 (2.36mm)	3.5	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	2.30	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 04/14/2024 - 04/20/2024

Name/Title Doug Storey / QC Technician

Report Date 04/19/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.8	%	95-100
	#8 (2.36mm)	80.8	%	65-95
	#16 (1.18mm)	64.2	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	21.9	%	10-30
	#100 (.15mm)	3.2	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.86		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.15	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-102**

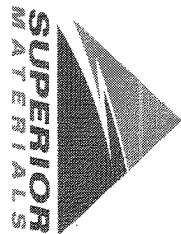
Sample Date: **4/15/24**

Dates Test Represents: **4/16/2024** through **4/22/2024**

Concrete Grade: **P1M, 3500HP**

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

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



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

Verify this number is 100%

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	58-003	Stonoco	1370	8.16	2.69	43.9
IA	58-003	Stonoco	550	3.28	2.69	17.6
NNS	63-114	Highland	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"	80.4	100.0	100.0	91.4	8.6	8.6
3/4"	49.9	100.0	100.0	78.0	13.4	22.0
1/2"	30.6	94.4	100.0	68.5	9.5	31.5
3/8"	20.8	81.2	100.0	61.9	6.6	38.1
#4	4.9	15.1	99.4	43.0	18.9	57.0
#8	2.9	2.2	85.7	34.6	8.4	65.4
#16	2.5	1.3	66.6	26.9	7.7	73.1
#30	2.4	1.1	46.4	19.1	7.8	80.9
#50	2.3	1.0	18.8	8.4	10.7	91.6
#100	2.2	1.0	3.8	2.6	5.8	97.4
LBW	2.0	0.9	0.9	1.4	1.2	98.6

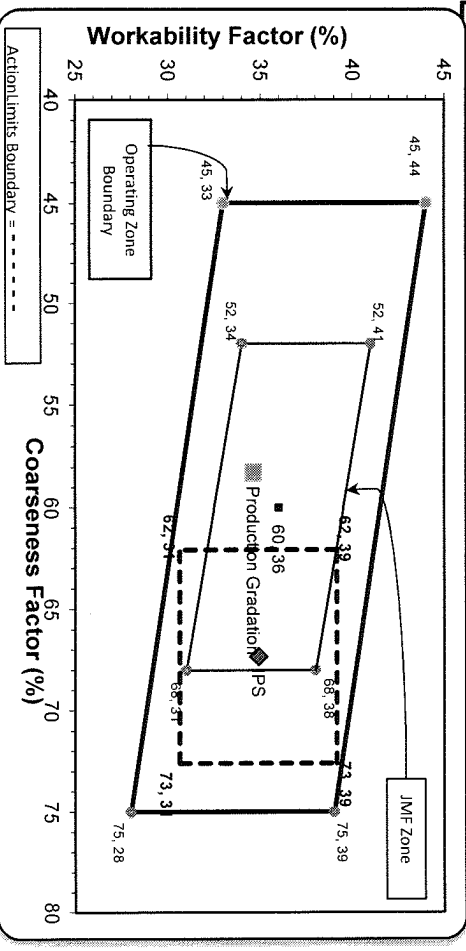
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max.  
 nom. max., #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when 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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Initial Production Sample (PS)

Coarseness Factor: **58** Workability Factor: **35**

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"	85.5	14.5	14.5
3/4"	73.4	12.1	26.6
1/2"	61.0	12.4	39.0
3/8"	56.2	4.8	43.8
#4	43.1	13.1	56.9
#8	34.9	8.2	65.1
#16	29.4	5.5	70.6
#30	21.6	7.8	78.4
#50	8.1	13.4	91.9
#100	2.2	5.9	97.8
LBW	1.4	0.8	98.6

PREPARED BY:  
SM, LLC Technical Service

Approved By:



**Plant** S102-Superior Novi

**Product** 7919-COARSE AGG P1M LS

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

**Period:** 04/14/2024 - 04/20/2024

**Report Date** 04/18/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	80.4	%	
	3/4" (19mm)	49.9	%	
	1/2" (12.5mm)	30.6	%	
	3/8" (9.5mm)	20.8	%	
	#4 (4.75mm)	4.9	%	
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-2
	Total Moisture	2.04	%	



Plant S102-Superior Novi

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/14/2024 - 04/20/2024

Report Date 04/18/2024

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)	94.4	%	
	3/8" (9.5mm)	81.2	%	
	#4 (4.75mm)	15.1	%	
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.1	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	1.0	%	
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.84	%	



Plant S102-Superior Novi  
Product 1022-2NS GR  
Period: 04/14/2024 - 04/20/2024

Name/Title Doug Storey / QC Technician  
Report Date 04/18/2024

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)	85.7	%	65-95
	#16 (1.18mm)	66.6	%	35-75
	#30 (.6mm)	46.4	%	20-55
	#50 (.3mm)	18.8	%	10-30
	#100 (.15mm)	3.8	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	4.25	%	