

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P11**

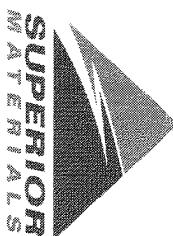
Sample Date: **10/23/23**

Dates Test Represents: **10/24/2023** through **10/30/2023**

Concrete Grade: **P1M, 3500HP**

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

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



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

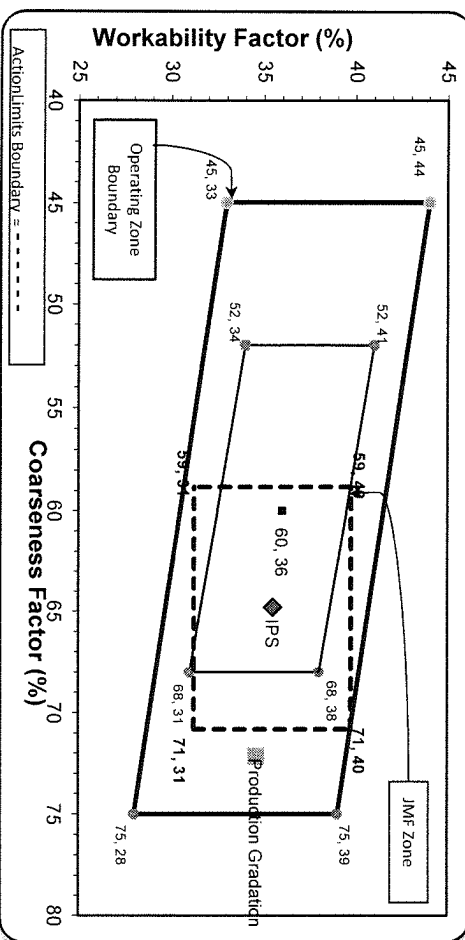
Agg. Class	Pit #	Source	Weight (ssd)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
ZNS	95-013	Smelter Bay	1200	7.26	2.65	39.1
			<b>Total Wt</b>	<b>3070</b>		<b>100.0</b>

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	34.8	100.0	100.0	79.8	19.2	20.2
3/4"	8.2	99.5	100.0	71.4	8.4	28.6
1/2"	1.9	74.9	100.0	62.1	9.3	37.9
3/8"	1.8	44.0	100.0	52.8	9.3	47.2
#4	1.8	7.2	95.8	40.2	12.7	59.8
#8	1.8	2.8	85.0	34.6	5.5	65.4
#16	1.8	2.2	70.3	28.7	5.9	71.3
#30	1.7	2.1	50.7	21.0	7.7	79.0
#50	1.7	2.0	24.5	10.7	10.3	89.3
#100	1.5	1.8	7.4	3.9	6.8	96.1
LBW	1.3	1.5	1.4	1.4	2.5	98.6

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **72** Workability Factor: **35**



Initial Production Sample (IPS)

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

\*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 S11-Onsite Jefferson

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/22/2023 - 10/28/2023

Report Date 10/28/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.9	%	
	1" (25mm)	34.8	%	
	3/4" (19mm)	8.2	%	
	1/2" (12.5mm)	1.9	%	
	3/8" (9.5mm)	1.8	%	
	#4 (4.75mm)	1.8	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	0.79	%	



Plant S11-Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/22/2023 - 10/28/2023

Report Date 10/28/2023

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)	99.5	%	
	1/2" (12.5mm)	74.9	%	
	3/8" (9.5mm)	44.0	%	
	#4 (4.75mm)	7.2	%	
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	3.10	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Period: 10/22/2023 - 10/28/2023

Name/Title Doug Storey / QC Technician

Report Date 10/28/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.8	%	95-100
	#8 (2.36mm)	85.0	%	65-95
	#16 (1.18mm)	70.3	%	35-75
	#30 (.6mm)	50.7	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.66		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.62	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-102**

Sample Date: **10/23/23**

Dates Test Represents: **10/24/2023** through **10/30/2023**

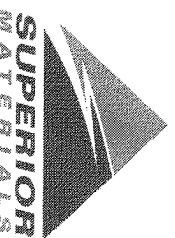
Concrete Grade: **P1M, 3500HP**

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

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

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
Total Wt			<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"	44.1	100.0	100.0	75.5	24.5	24.5
3/4"	11.5	100.0	100.0	61.1	38.9	38.9
1/2"	5.8	88.4	100.0	56.6	43.4	43.4
3/8"	4.6	67.6	100.0	52.4	47.6	47.6
#4	3.8	20.6	98.1	43.0	57.0	57.0
#8	3.3	8.4	84.4	35.4	64.6	64.6
#16	3.0	4.7	65.8	27.5	72.5	72.5
#30	2.8	3.4	45.0	19.1	80.9	80.9
#50	2.5	2.9	19.9	9.3	90.7	90.7
#100	2.2	2.7	3.6	2.8	97.2	97.2
LBW	1.9	2.4	0.3	1.4	98.6	98.6

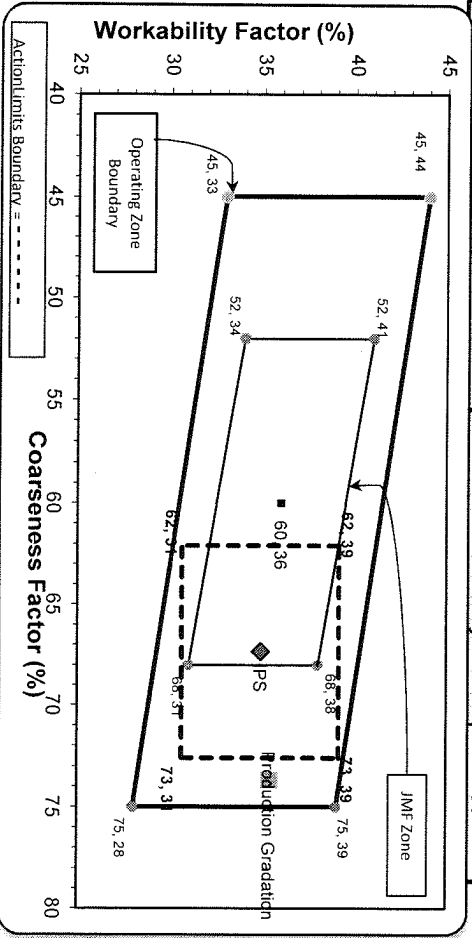


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\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 nom. max. #100 and #200 sieves.  
 \*\*% Retained must be at least 4% for each sieve except max.  
 nom. max. #100 and #200 sieves.  
 \*\*\*%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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **74** Workability Factor: **35**



Initial Production Sample (IPS)

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  
**Period:** 10/22/2023 - 10/28/2023

**Name/Title** Doug Storey / QC Technician  
**Report Date** 10/28/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	44.1	%	
	3/4" (19mm)	11.5	%	
	1/2" (12.5mm)	5.8	%	
	3/8" (9.5mm)	4.6	%	
	#4 (4.75mm)	3.8	%	
	#8 (2.36mm)	3.3	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	2.37	%	



Plant S102-Superior Novi

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/22/2023 - 10/28/2023

Report Date 10/28/2023

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)	88.4	%	
	3/8" (9.5mm)	67.6	%	
	#4 (4.75mm)	20.6	%	
	#8 (2.36mm)	8.4	%	
	#16 (1.18mm)	4.7	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.4	%	0-3
	Total Moisture	3.22	%	



Plant S102-Superior Novi  
Product 1022-2NS GR  
Period: 10/22/2023 - 10/28/2023

Name/Title Doug Storey / QC Technician  
Report Date 10/28/2023

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)	84.4	%	65-95
	#16 (1.18mm)	65.8	%	35-75
	#30 (.6mm)	45.0	%	20-55
	#50 (.3mm)	19.9	%	10-30
	#100 (.15mm)	3.6	%	0-10
	#200 (75µm)	0.3	%	
	FM	2.83		2.6-3
	Wash Loss (#200/75um)	0.3	%	0-3
	Total Moisture	4.11	%	