

# Aggregate Optimization Chart

## Production Gradation Report

PLANT #: **P11**

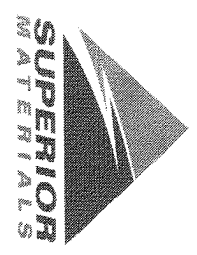
Sample Date: **6/12/23**

Dates Test Represents: **6/13/2023** through **6/19/2023**

Concrete Grade: **P1M, 3500HP**

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

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



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

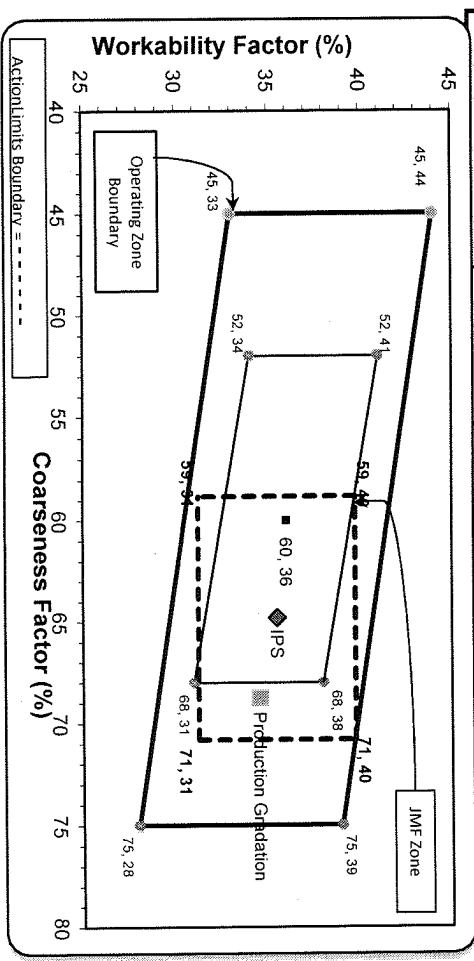
Agg. Class	Pit #	Source	Weight (ssd)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		<b>Total Wt</b>	<b>3070</b>			<b>100.0</b>

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.4	100.0	100.0	99.1	0.9	0.9
1"	36.4	100.0	100.0	77.8	21.3	22.2
3/4"	7.4	99.3	100.0	67.6	10.3	32.4
1/2"	2.7	81.4	100.0	61.5	6.0	38.5
3/8"	2.4	55.0	100.0	55.0	6.6	45.0
#4	2.4	11.0	96.7	42.9	12.1	57.1
#8	2.3	4.1	80.4	34.5	8.4	65.5
#16	2.2	3.1	65.3	28.1	6.4	71.9
#30	2.2	2.8	49.5	21.6	6.5	78.4
#50	2.1	2.6	25.1	11.6	10.0	88.4
#100	2.0	2.5	5.1	3.4	8.2	96.6
LBW	1.6	2.1	0.8	1.4	2.0	98.6

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **69** Workability Factor: **35**



Initial Production Sample (IPS)

Sieve	% 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

Coarseness Factor: **65** Workability Factor: **36**

\*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: 06/11/2023 - 06/17/2023

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.4	%	
	1" (25mm)	36.2	%	
	3/4" (19mm)	7.4	%	
	1/2" (12.5mm)	2.7	%	
	3/8" (9.5mm)	2.4	%	
	#4 (4.75mm)	2.4	%	
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	1.86	%	



Plant S11 - Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/11/2023 - 06/17/2023

Report Date 06/17/2023

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)	99.3	%	
	1/2" (12.5mm)	81.4	%	
	3/8" (9.5mm)	55.0	%	
	#4 (4.75mm)	11.0	%	
	#8 (2.36mm)	4.1	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	3.29	%	



Plant S11 - Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/11/2023 - 06/17/2023

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.7	%	95-100
	#8 (2.36mm)	80.4	%	65-95
	#16 (1.18mm)	65.3	%	35-75
	#30 (.6mm)	49.5	%	20-55
	#50 (.3mm)	25.1	%	10-30
	#100 (.15mm)	5.1	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	3.17	%	

# Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: **6/12/23**

Dates Test Represents: **6/13/2023** through **6/19/2023**

Concrete Grade: **P1M, 3500HP**

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

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

Agg. 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
NNS	75-051	Mid Michigan	1200	7.23	2.66	39.1
Total Wt:			3070	18.67		100.0

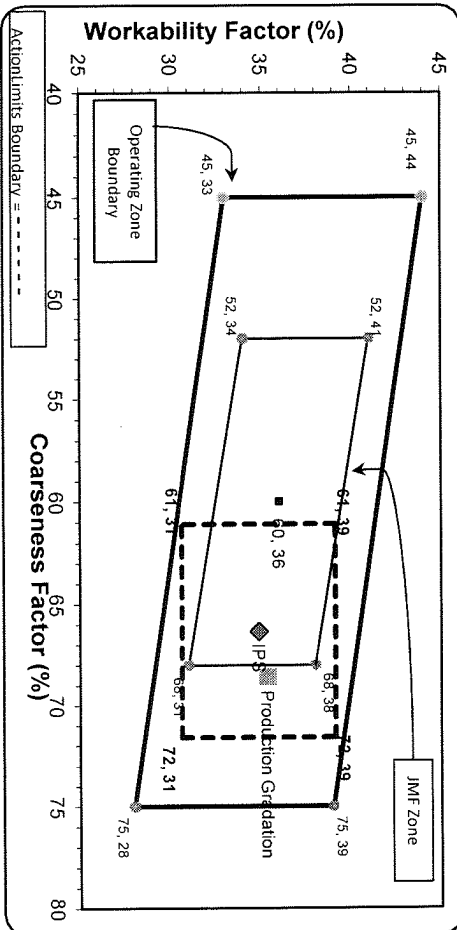
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Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.2	100.0	100.0	98.7	1.3	1.3
1"	40.7	100.0	100.0	79.3	19.3	20.7
3/4"	15.5	99.6	100.0	70.4	8.9	29.6
1/2"	6.3	78.5	100.0	61.7	8.7	38.3
3/8"	5.0	56.9	100.0	55.7	6.1	44.3
#4	3.8	14.4	96.7	42.9	12.8	57.1
#8	3.4	4.8	84.2	35.3	7.5	64.7
#16	3.2	3.3	71.3	29.8	5.5	70.2
#30	3.0	3.0	55.0	23.3	6.5	76.7
#50	2.8	2.8	26.4	12.0	11.3	88.0
#100	2.4	2.7	6.9	4.2	7.8	95.8
LBW	2.0	2.3	0.8	1.6	2.6	98.4

\*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: **35**



Initial Production Sample (IPS)  
 Coarseness Factor: **66**  
 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"	84.3	15.3	15.7
3/4"	74.8	9.6	25.2
1/2"	64.3	10.4	35.7
3/8"	56.8	7.5	43.2
#4	43.0	13.8	57.0
#8	34.9	8.1	65.1
#16	26.4	8.5	73.6
#30	19.9	6.5	80.1
#50	10.4	9.5	89.6
#100	3.4	7.0	96.6
LBW	1.2	2.2	98.8

PREPARED BY:  
 SM, LLC Technical Service

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



Plant S101-Superior Mount Clemens

Product 7919-COARSE AGG P1M LS

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.2	%	
	1" (25mm)	40.7	%	
	3/4" (19mm)	15.5	%	
	1/2" (12.5mm)	6.3	%	
	3/8" (9.5mm)	5.0	%	
	#4 (4.75mm)	3.8	%	
	#8 (2.36mm)	3.4	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-2
	Total Moisture	1.22	%	



Plant S101-Superior Mount Clemens

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/11/2023 - 06/17/2023

Report Date 06/17/2023

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)	99.6	%	
	1/2" (12.5mm)	78.5	%	
	3/8" (9.5mm)	56.9	%	
	#4 (4.75mm)	14.4	%	
	#8 (2.36mm)	4.8	%	
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	3.04	%	



Plant S101-Superior Mount Clemens

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/11/2023 - 06/17/2023

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.7	%	95-100
	#8 (2.36mm)	84.2	%	65-95
	#16 (1.18mm)	71.3	%	35-75
	#30 (.6mm)	55.0	%	20-55
	#50 (.3mm)	26.4	%	10-30
	#100 (.15mm)	6.9	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.59		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	3.78	%	