

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: 11

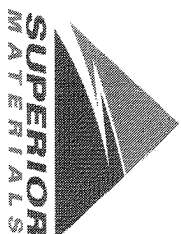
Contractor: \_\_\_\_\_

Sample Date: 10/24/22

Concrete Grade: P1M, 3500HP

Dates Test Represents: 10/25/2022 through 10/31/2022

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	900	5.50	2.62	29.3
IA	71-47	Presque Isle	920	5.63	2.62	30.0
ZNS	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	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	92.1	100.0	100.0	97.7	2.3	2.3
1"	36.3	100.0	100.0	81.3	16.4	18.7
3/4"	7.0	99.1	100.0	72.5	8.9	27.5
1/2"	2.6	84.6	100.0	66.8	5.6	33.2
3/8"	2.4	63.7	100.0	60.5	6.3	39.5
#4	2.1	18.0	96.4	45.3	15.2	54.7
#8	2.1	6.0	79.6	34.8	10.4	65.2
#16	2.0	3.6	65.1	28.2	6.7	71.8
#30	1.9	3.2	50.3	22.0	6.2	78.0
#50	1.8	3.0	28.1	12.9	9.1	87.1
#100	1.5	2.8	6.6	4.0	8.9	96.0
LBW	1.1	2.2	0.8	1.3	2.7	98.7

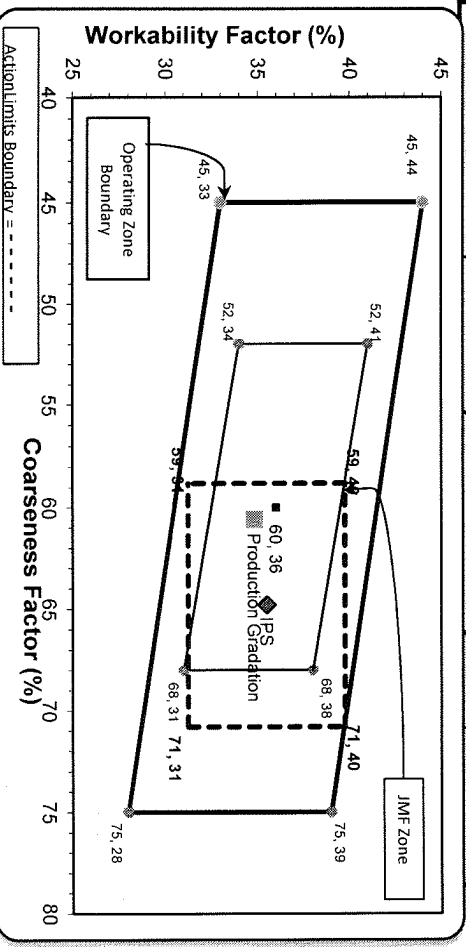
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 nom. max. #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max.  
 nom. max. #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when  
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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **61** 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-Superior Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/23/2022 - 10/29/2022

Report Date 10/28/2022

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)	65.1	%	35-75
	#30 (.6mm)	50.3	%	20-55
	#50 (.3mm)	28.1	%	10-30
	#100 (.15mm)	6.6	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	4.14	%	



Plant S11-Superior Onsite Jefferson  
 Product 7920-INTERMED AGG P1M LS  
 Period: 10/23/2022 - 10/29/2022

Name/Title Doug Storey / QC Technician  
 Report Date 10/28/2022

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)	99.1	%	
	1/2" (12.5mm)	84.6	%	
	3/8" (9.5mm)	63.7	%	
	#4 (4.75mm)	18.0	%	
	#8 (2.36mm)	6.0	%	
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	3.2	%	
	#50 (.3mm)	3.0	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	2.72	%	



Plant S11-Superior Onsite Jefferson

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/23/2022 - 10/29/2022

Report Date 10/28/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	92.1	%	
	1" (25mm)	36.3	%	
	3/4" (19mm)	7.0	%	
	1/2" (12.5mm)	2.6	%	
	3/8" (9.5mm)	2.4	%	
	#4 (4.75mm)	2.1	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	1.15	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-35**

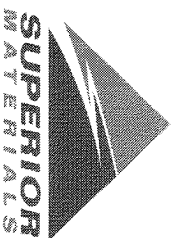
Sample Date: **10/24/22**

Dates Test Represents: **10/25/2022** through **10/31/2022**

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	3.23	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>

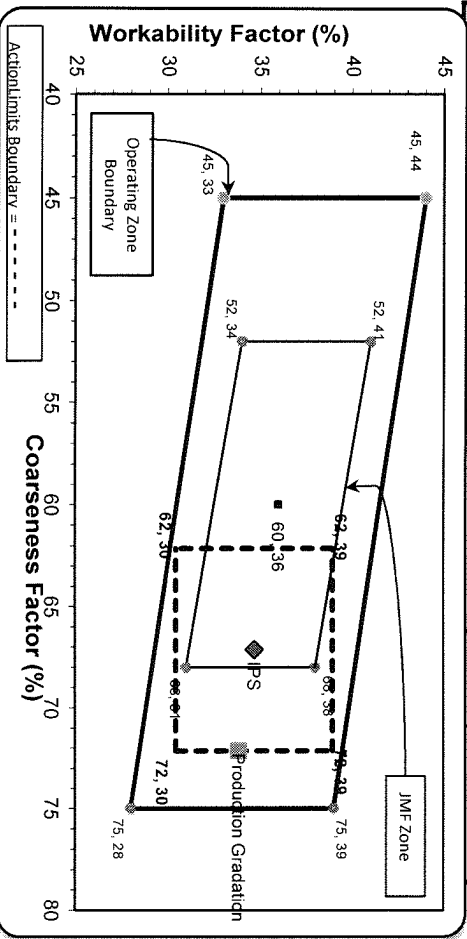
  

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	49.2	100.0	100.0	77.7	22.3	22.3
3/4"	20.0	100.0	100.0	64.9	12.8	35.1
1/2"	7.0	91.9	100.0	57.7	7.1	42.3
3/8"	3.6	69.6	100.0	52.3	5.4	47.7
#4	1.6	17.1	97.7	41.3	11.0	58.7
#8	1.4	5.8	83.8	33.9	7.4	66.1
#16	1.2	3.3	67.4	27.0	6.8	73.0
#30	1.2	2.5	49.5	20.0	7.0	80.0
#50	1.1	2.2	24.2	10.2	9.8	89.8
#100	1.0	2.1	7.3	3.6	6.6	96.4
LBW	0.8	1.9	1.2	1.1	2.5	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: **72** 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: 10/23/2022 - 10/29/2022

Report Date 10/28/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.7	%	95-100
	#8 (2.36mm)	83.8	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	49.5	%	20-55
	#50 (.3mm)	24.2	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
ASTM C566	Total Moisture	4.30	%	



Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/23/2022 - 10/29/2022

Report Date 10/28/2022

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)	91.9	%	
	3/8" (9.5mm)	69.9	%	
	#4 (4.75mm)	17.1	%	
	#8 (2.36mm)	5.8	%	
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75µm)	1.9	%	0-3
ASTM C566	Total Moisture	3.36	%	



**Plant** S35-Superior Romulus

**Product** 7919-COARSE AGG P1M LS

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

**Period:** 10/23/2022 - 10/29/2022

**Report Date** 10/28/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	49.2	%	
	3/4" (19mm)	20.0	%	
	1/2" (12.5mm)	7.0	%	
	3/8" (9.5mm)	3.6	%	
	#4 (4.75mm)	1.6	%	
	#8 (2.36mm)	1.4	%	
	#16 (1.18mm)	1.2	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75um)	0.8	%	0-2
ASTM C566	Total Moisture	2.11	%	