

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-101**

Sample Date: **8/23/21**

Dates Test Represents: **8/24/2021** through **8/30/2021**

Concrete Grade: **P1M**

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

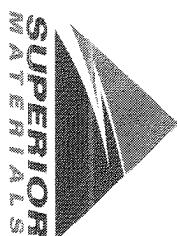
MDOT No.: \_\_\_\_\_

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
			<b>Total Wt</b>	<b>3070</b>	<b>18.67</b>	<b>100.0</b>

Verify this number is 100%

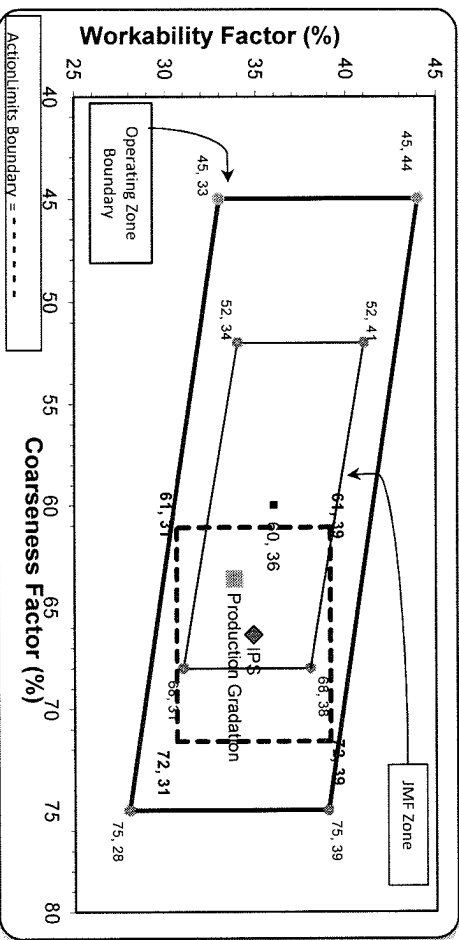
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	92.8	100.0	100.0	97.5	2.5	2.5
1"	29.8	100.0	100.0	75.5	22.0	24.5
3/4"	13.6	100.0	100.0	69.9	5.6	30.1
1/2"	5.8	88.6	100.0	64.2	5.7	35.8
3/8"	4.0	66.8	100.0	57.9	6.3	42.1
#4	3.1	19.2	99.1	44.8	13.1	55.2
#8	2.8	5.9	80.1	33.8	11.0	66.2
#16	2.6	3.4	62.4	26.2	7.6	73.8
#30	2.6	3.0	47.2	20.1	6.0	79.9
#50	2.3	2.8	23.4	10.7	9.5	89.3
#100	2.0	2.5	7.3	4.2	6.5	95.8
LBW	1.5	1.6	1.7	1.6	2.6	98.4

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



\*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: **64** Workability Factor: **34**



Sieve	Initial Production Sample (IPS)		Workability Factor: <b>66</b>		Workability Factor: <b>35</b>	
	Cumulative % Passing	% Retained	Cumulative % Passing	% Retained	Cumulative % Retained	% Retained
2"	100.0	0.0	100.0	0.0	0.0	0.0
1.5"	99.6	0.4	99.6	0.4	0.4	0.4
1"	84.3	15.3	84.3	15.3	15.7	15.7
3/4"	74.8	9.6	74.8	9.6	25.2	25.2
1/2"	64.3	10.4	64.3	10.4	35.7	35.7
3/8"	56.8	7.5	56.8	7.5	43.2	43.2
#4	43.0	13.8	43.0	13.8	57.0	57.0
#8	34.9	8.1	34.9	8.1	65.1	65.1
#16	26.4	8.5	26.4	8.5	73.6	73.6
#30	19.9	6.5	19.9	6.5	80.1	80.1
#50	10.4	9.5	10.4	9.5	89.6	89.6
#100	3.4	7.0	3.4	7.0	96.6	96.6
LBW	1.2	2.2	1.2	2.2	98.8	98.8

PREPARED BY:  
SM, LLC Technical Service

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



Plant S101-Superior Mount Clemens

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 08/22/2021 - 08/28/2021

Report Date 08/28/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.1	%	95-100
	#8 (2.36mm)	80.1	%	65-95
	#16 (1.18mm)	62.4	%	35-75
	#30 (.6mm)	47.2	%	20-55
	#50 (.3mm)	23.4	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.80		2.6-3
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	6.52	%	



Plant S101-Superior Mount Clemens  
 Product 7920-INTERMED AGG P1M LS  
 Period: 08/22/2021 - 08/28/2021

Name/Title Doug Storey / QC Technician  
 Report Date 08/28/2021

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)	88.6	%	
	3/8" (9.5mm)	66.8	%	
	#4 (4.75mm)	19.2	%	
	#8 (2.36mm)	5.9	%	
	#16 (1.18mm)	3.4	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	4.06	%	



**Plant** S101-Superior Mount Clemens

**Product** 7919-COARSE AGG P1M LS

**Period:** 08/22/2021 - 08/28/2021

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

**Report Date** 08/28/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	92.8	%	
	1" (25mm)	29.8	%	
	3/4" (19mm)	13.6	%	
	1/2" (12.5mm)	5.8	%	
	3/8" (9.5mm)	4.0	%	
	#4 (4.75mm)	3.1	%	
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	1.76	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-02**

Sample Date: 8/23/21

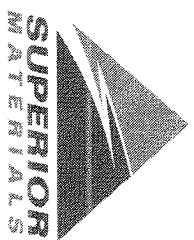
Dates Test Represents: 8/24/2021

through 8/30/2021

Concrete Grade: **P1M**

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

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



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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	870	5.32	2.62	28.3
ZNS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

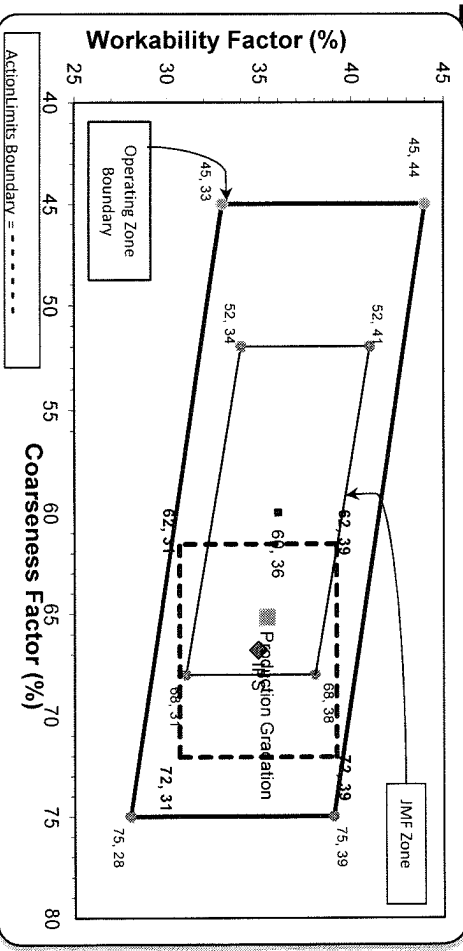
  

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.1	100.0	100.0	98.2	1.8	1.8
1"	28.7	100.0	100.0	77.9	20.2	22.1
3/4"	7.6	96.6	100.0	70.4	7.5	29.6
1/2"	2.5	81.2	100.0	64.5	5.9	35.5
3/8"	2.2	58.2	100.0	57.9	6.6	42.1
#4	2.0	15.9	96.3	44.3	13.6	55.7
#8	1.9	5.6	81.6	35.4	8.9	64.6
#16	1.8	3.8	66.6	28.8	6.6	71.2
#30	1.7	3.3	52.6	22.9	5.9	77.1
#50	1.6	3.0	28.3	12.9	10.0	87.1
#100	1.4	2.6	8.8	4.8	8.1	95.2
LBW	0.9	1.4	1.0	1.1	3.7	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: **65** Workability Factor: **35**



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"			15.0	15.0
3/4"			12.7	27.7
1/2"			7.8	35.5
3/8"			8.0	43.5
#4			13.8	57.3
#8			7.8	65.1
#16			5.9	71.0
#30			8.0	79.0
#50			12.8	91.8
#100			6.5	98.4
LBW			0.9	99.3

PREPARED BY:  
SM, LLC Technical Service

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



Plant S02-Superior Hoover  
Product 1022-2NS GR  
Period: 08/22/2021 - 08/28/2021

Name/Title Doug Storey / QC Technician  
Report Date 08/28/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.3	%	95-100
	#8 (2.36mm)	81.6	%	65-95
	#16 (1.18mm)	66.6	%	35-75
	#30 (.6mm)	52.6	%	20-55
	#50 (.3mm)	28.3	%	10-30
	#100 (.15mm)	8.8	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.66		2.6-3
	Wash Loss (#200/75µm)	1.0	%	0-3
	Total Moisture	3.60	%	



Plant S02-Superior Hoover

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 08/22/2021 - 08/28/2021

Report Date 08/28/2021

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)	96.6	%	
	1/2" (12.5mm)	81.2	%	
	3/8" (9.5mm)	58.2	%	
	#4 (4.75mm)	15.9	%	
	#8 (2.36mm)	5.6	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.0	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.20	%	



**Plant** S02-Superior Hoover

**Product** 7919-COARSE AGG P1M LS

**Period:** 08/22/2021 - 08/28/2021

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

**Report Date** 08/28/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.1	%	
	1" (25mm)	28.7	%	
	3/4" (19mm)	7.6	%	
	1/2" (12.5mm)	2.5	%	
	3/8" (9.5mm)	2.2	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	1.85	%	