

Aggregate Optimization Chart

Production Gradation Report

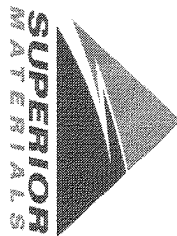
PLANT #: **P11**

Sample Date: **9/1/23**

Dates Test Represents: **9/12/2023** through **9/18/2023**

Concrete Grade: **P1M, 3500HP**

Contractor: _____
MDOT No.: _____



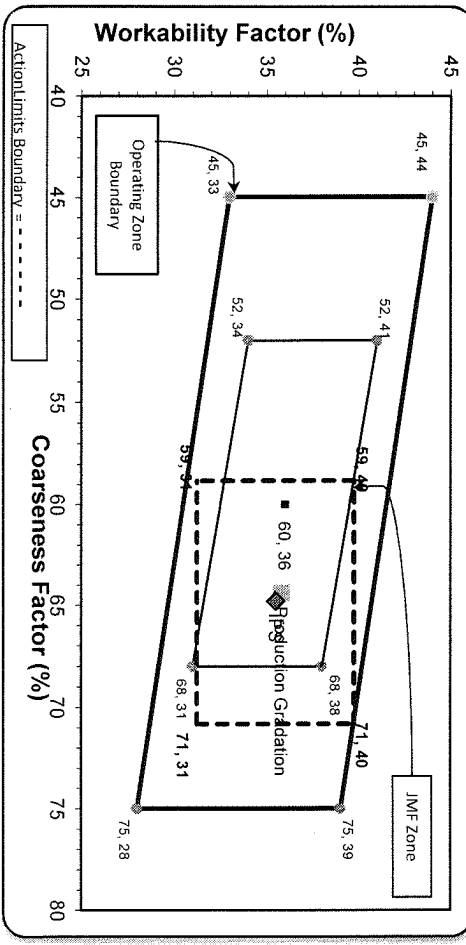
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
NNS	95-013	Smelter Bay	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

Sieve	CA	IA	NNS	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"	48.4	100.0	100.0	85.4	14.1	14.6
3/4"	19.6	96.4	100.0	76.0	9.3	24.0
1/2"	9.9	77.9	100.0	67.3	8.8	32.7
3/8"	7.7	53.4	100.0	58.7	8.6	41.3
#4	4.3	11.1	97.4	42.9	15.8	57.1
#8	2.9	3.6	86.5	35.8	7.1	64.2
#16	2.6	2.7	71.5	29.6	6.2	70.4
#30	2.5	2.5	51.6	21.7	7.9	78.3
#50	2.4	2.4	24.5	11.0	10.7	89.0
#100	2.2	2.3	7.4	4.3	6.8	95.7
LBW	1.9	2.0	1.4	1.7	2.5	98.3

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **64** Workability Factor: **36**



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: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.3	%	
	1" (25mm)	48.4	%	
	3/4" (19mm)	19.6	%	
	1/2" (12.5mm)	9.9	%	
	3/8" (9.5mm)	7.7	%	
	#4 (4.75mm)	4.3	%	
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	2.77	%	



Plant S11-Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

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)	96.4	%	
	1/2" (12.5mm)	77.9	%	
	3/8" (9.5mm)	53.4	%	
	#4 (4.75mm)	11.1	%	
	#8 (2.36mm)	3.6	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.14	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.4	%	95-100
	#8 (2.36mm)	86.5	%	65-95
	#16 (1.18mm)	71.5	%	35-75
	#30 (.6mm)	51.6	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.61		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	4.38	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: 12

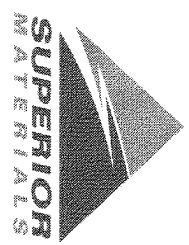
Sample Date: 9/11/23

Dates Test Represents: 9/12/2023 through 9/18/2023

Concrete Grade: P1M, 3500HP

Contractor: _____

MDOT No.: _____



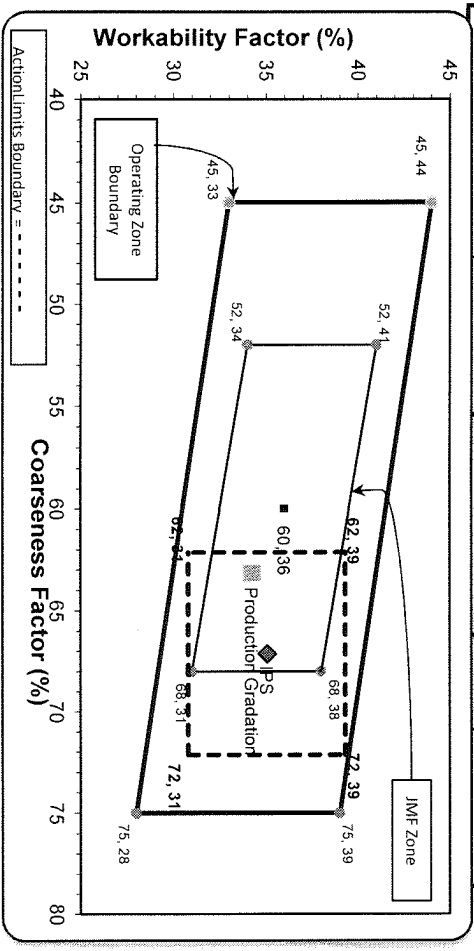
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Cumulative % Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
N2S	63-115	Ray Rd	1200	7.26	2.65	39.1
		Total Wt:	3070			100.0

Sieve	CA	IA	N2S	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	99.1	0.9	0.9
1"	27.7	100.0	100.0	79.5	19.6	20.5
3/4"	8.0	99.2	100.0	73.7	5.8	26.3
1/2"	4.2	78.5	100.0	65.8	7.8	34.2
3/8"	3.9	56.1	100.0	58.5	7.4	41.5
#4	3.6	15.0	96.2	43.5	15.0	56.5
#8	2.9	5.2	81.2	34.3	9.3	65.7
#16	2.4	3.9	67.4	28.3	6.0	71.7
#30	2.2	3.6	50.8	21.7	6.6	78.3
#50	2.0	3.4	24.9	11.4	10.2	88.6
#100	1.7	3.3	5.3	3.6	7.8	96.4
LBW	1.3	2.8	0.6	1.5	2.1	98.5

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **63** Workability Factor: **34**



Initial Production Sample (IPS)

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

Coarseness Factor: **67** Workability Factor: **35**

*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 S12-Onsite Southfield

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.9	%	
	1" (25mm)	27.7	%	
	3/4" (19mm)	8.0	%	
	1/2" (12.5mm)	4.2	%	
	3/8" (9.5mm)	3.9	%	
	#4 (4.75mm)	3.6	%	
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	1.60	%	



Plant S12-Onsite Southfield

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

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)	99.2	%	
	1/2" (12.5mm)	78.5	%	
	3/8" (9.5mm)	56.1	%	
	#4 (4.75mm)	15.0	%	
	#8 (2.36mm)	5.2	%	
	#16 (1.18mm)	3.9	%	
	#30 (.6mm)	3.6	%	
	#50 (.3mm)	3.4	%	
	#100 (.15mm)	3.3	%	
	#200 (75µm)	3.0	%	
	Wash Loss (#200/75um)	2.8	%	0-3
	Total Moisture	3.45	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 09/10/2023 - 09/16/2023

Name/Title Doug Storey / QC Technician

Report Date 09/16/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.2	%	95-100
	#8 (2.36mm)	81.2	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	50.8	%	20-55
	#50 (.3mm)	24.9	%	10-30
	#100 (.15mm)	5.3	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.39	%	