

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

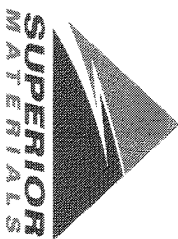
Sample Date: 10/16/23

Dates Test Represents: 10/17/2023 through 10/23/2023

Concrete Grade: P1M, 3500HP

Contractor: _____

MDOT No.: _____



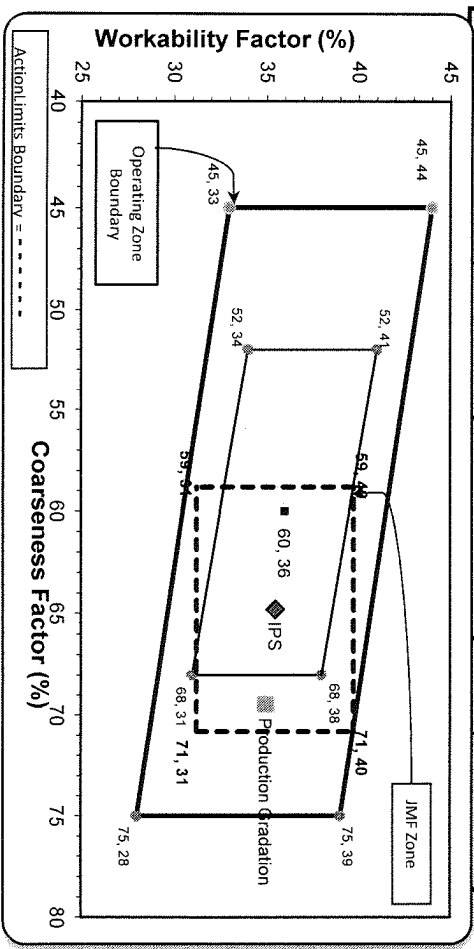
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (ssp)	ft ³	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
NNS	95-013	Smelter Bay	1200	7.26	2.65	39.1
			Total Wt	3070		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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	43.3	100.0	100.0	82.5	17.5	17.5
3/4"	10.4	97.1	100.0	71.4	28.6	28.6
1/2"	3.3	75.3	100.0	62.7	37.3	37.3
3/8"	2.2	50.3	100.0	54.8	45.2	45.2
#4	1.5	9.6	96.7	41.1	58.9	58.9
#8	1.4	3.9	85.4	35.0	65.0	65.0
#16	1.4	3.0	70.6	28.9	71.1	71.1
#30	1.2	2.7	52.2	21.6	78.4	78.4
#50	1.0	2.6	24.8	10.8	89.2	89.2
#100	0.9	2.5	7.6	4.0	96.0	96.0
LBW	0.7	2.3	1.7	1.6	98.4	98.4

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **69** 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: _____

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/15/2023 - 10/21/2023

Report Date 10/21/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	43.3	%	
	3/4" (19mm)	10.4	%	
	1/2" (12.5mm)	3.3	%	
	3/8" (9.5mm)	2.2	%	
	#4 (4.75mm)	1.5	%	
	#8 (2.36mm)	1.4	%	
	#16 (1.18mm)	1.4	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.8	%	
	Wash Loss (#200/75um)	0.7	%	0-2
	Total Moisture	1.8	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/15/2023 - 10/21/2023

Report Date 10/21/2023

Procedure	Sieve/Test	Result	Unit	Intermed Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	97.1	%	
	1/2" (12.5mm)	75.3	%	
	3/8" (9.5mm)	50.3	%	
	#4 (4.75mm)	9.6	%	
	#8 (2.36mm)	3.9	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	3.8	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 10/15/2023 - 10/21/2023

Report Date 10/21/2023

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)	85.4	%	65-95
	#16 (1.18mm)	70.6	%	35-75
	#30 (.6mm)	52.2	%	20-55
	#50 (.3mm)	24.8	%	10-30
	#100 (.15mm)	7.6	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.63		2.6-3
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	4.6	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

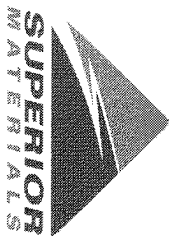
Sample Date: 10/16/23

Dates Test Represents: 10/17/2023 through 10/23/2023

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



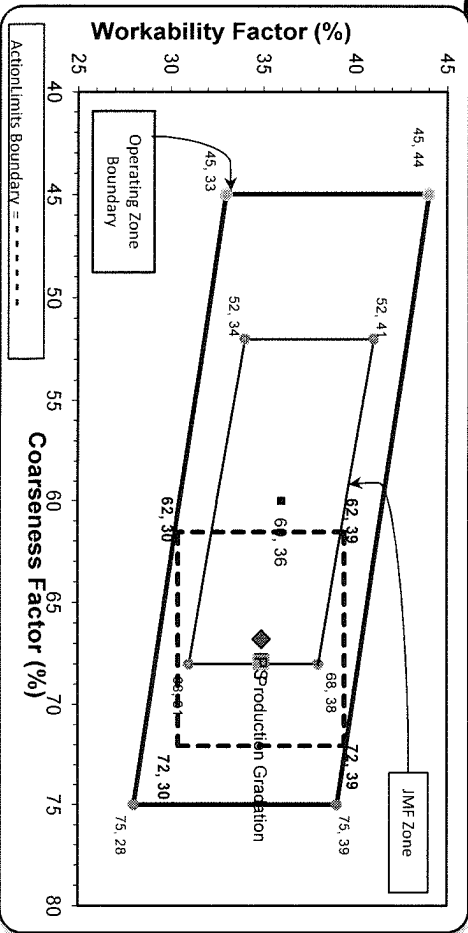
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %	
CA	71-47	Presque Isle	1000	6.12	2.62	32.6	
IA	71-47	Presque Isle	870	5.32	2.62	28.3	
NNS	63-92	Grange Hall	1200	7.26	2.65	39.1	
Total Wt						3070	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"	96.6	100.0	100.0	98.9	1.1	1.1
1"	30.4	100.0	100.0	77.3	21.6	22.7
3/4"	7.0	98.2	100.0	69.2	8.1	30.8
1/2"	2.9	78.6	100.0	62.3	6.9	37.7
3/8"	2.7	55.9	100.0	55.8	6.5	44.2
#4	2.5	12.2	97.0	42.2	13.6	57.8
#8	2.5	4.0	84.3	34.9	7.3	65.1
#16	2.4	3.0	68.9	28.6	6.3	71.4
#30	2.4	2.7	48.6	20.5	8.0	79.5
#50	2.2	2.6	17.8	8.4	12.1	91.6
#100	2.0	2.5	2.6	2.4	6.0	97.6
LBW	1.5	2.1	0.7	1.4	1.0	98.6

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **68** Workability Factor: **35**



Initial Production Sample (IPS)

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

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	85.0	15.0	15.0
3/4"	72.1	12.9	27.9
1/2"	64.5	7.6	35.5
3/8"	56.5	8.0	43.5
#4	42.7	13.8	57.3
#8	34.9	7.8	65.1
#16	29.0	5.9	71.0
#30	21.0	8.0	79.0
#50	8.2	12.8	91.8
#100	1.6	6.5	98.4
LBW	0.7	0.9	99.3

*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: _____



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/15/2023 - 10/21/2023

Report Date 10/21/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.6	%	
	1" (25mm)	30.4	%	
	3/4" (19mm)	7.0	%	
	1/2" (12.5mm)	2.9	%	
	3/8" (9.5mm)	2.7	%	
	#4 (4.75mm)	2.5	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	2.72	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/15/2023 - 10/21/2023

Report Date 10/21/2023

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)	98.2	%	
	1/2" (12.5mm)	78.6	%	
	3/8" (9.5mm)	55.9	%	
	#4 (4.75mm)	12.2	%	
	#8 (2.36mm)	4.0	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	4.08	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/15/2023 - 10/21/2023

Report Date 10/21/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	84.3	%	65-95
	#16 (1.18mm)	68.9	%	35-75
	#30 (.6mm)	48.6	%	20-55
	#50 (.3mm)	17.8	%	10-30
	#100 (.15mm)	2.6	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.81		2.6-3
	Wash Loss (#200/75µm)	0.7	%	0-3
	Total Moisture	3.50	%	