

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

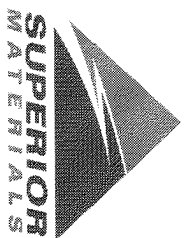
Sample Date: 11/15/21

Dates Test Represents: 11/16/2021 through 11/22/2021

Concrete Grade: **P1M**

MIDOT No.:

Contractor:



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	950	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		Total Wt	3070			100.0

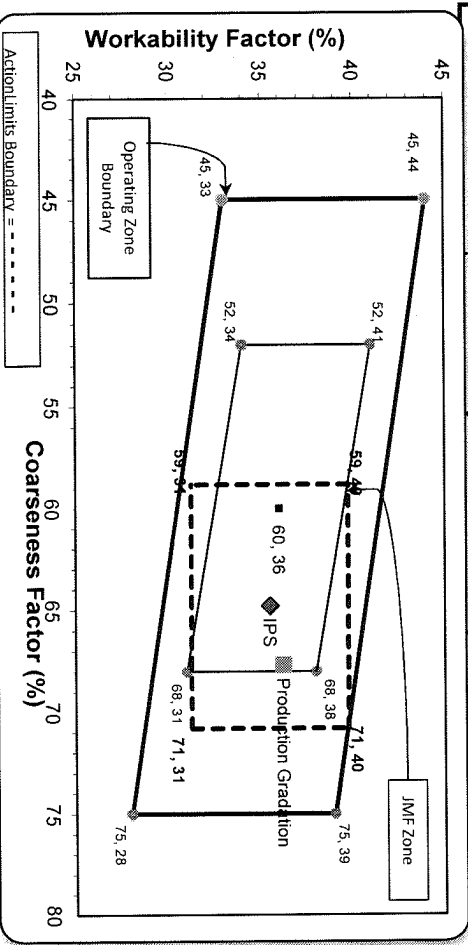
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	46.4	100.0	100.0	83.4	16.6	16.6
3/4"	11.9	98.2	100.0	72.2	11.2	27.8
1/2"	4.2	78.8	100.0	64.3	7.9	35.7
3/8"	3.2	53.4	100.0	56.8	7.5	43.2
#4	3.0	14.4	95.7	44.0	12.9	56.0
#8	2.8	6.5	82.3	36.2	7.8	63.8
#16	2.6	4.8	67.3	29.6	6.7	70.4
#30	2.5	4.2	48.8	21.8	7.7	78.2
#50	2.4	3.9	25.5	12.2	9.6	87.8
#100	2.2	3.5	8.1	5.0	7.3	95.0
LBW	1.7	2.5	1.4	1.8	3.2	98.2

Verify this number is 100%

*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: **68** Workability Factor: **36**



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

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 11/14/2021 - 11/20/2021

Report Date 11/19/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	82.3	%	65-95
	#16 (1.18mm)	67.3	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	25.5	%	10-30
	#100 (.15mm)	8.1	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	5.0	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 11/14/2021 - 11/20/2021

Report Date 11/19/2021

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)	98.2	%	
	1/2" (12.5mm)	78.8	%	
	3/8" (9.5mm)	53.4	%	
	#4 (4.75mm)	14.4	%	
	#8 (2.36mm)	6.5	%	
	#16 (1.18mm)	4.8	%	
	#30 (.6mm)	4.2	%	
	#50 (.3mm)	3.9	%	
	#100 (.15mm)	3.5	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	3.2	%	

Edw. C. Levy Co.

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8911 W. Jefferson
Detroit, 48209
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Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 11/14/2021 - 11/20/2021

Report Date 11/19/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	46.4	%	
	3/4" (19mm)	11.9	%	
	1/2" (12.5mm)	4.2	%	
	3/8" (9.5mm)	3.2	%	
	#4 (4.75mm)	3.0	%	
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	2.1	%	

Aggregate Optimization Chart

PLANT #: **P-02**

Sample Date: 11/15/21

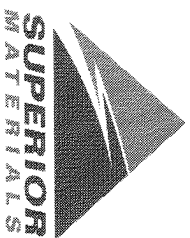
Dates Test Represents: 11/16/2021 through 11/22/2021

Concrete Grade: **P-1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	960	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0



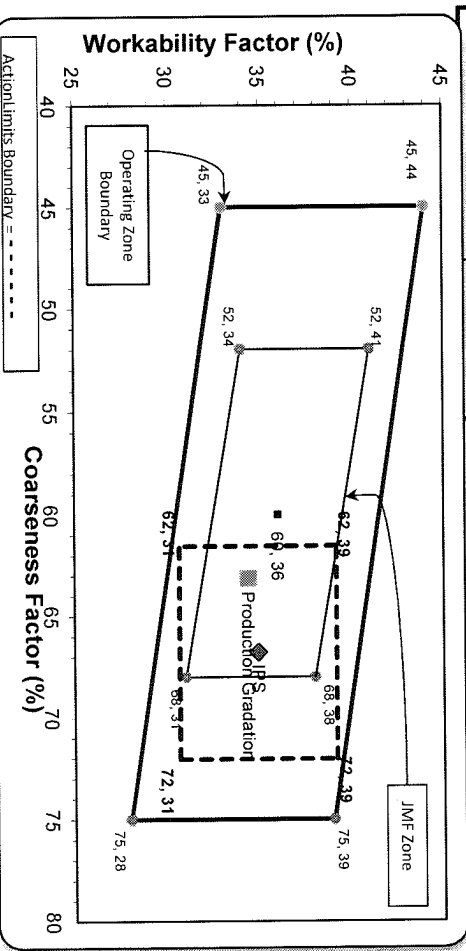
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	92.6	100.0	100.0	97.7	2.3	2.3
1"	35.5	100.0	100.0	80.0	17.7	20.0
3/4"	9.1	98.4	100.0	71.4	8.6	28.6
1/2"	1.7	82.1	100.0	64.5	6.9	35.5
3/8"	1.5	61.4	100.0	58.6	5.9	41.4
#4	1.5	18.1	95.8	44.6	14.0	55.4
#8	1.4	7.6	78.1	34.4	10.2	65.6
#16	1.4	5.0	62.3	27.2	7.2	72.8
#30	1.4	4.1	46.2	20.4	6.8	79.6
#50	1.4	3.8	24.1	11.3	9.1	88.7
#100	1.4	3.4	7.0	4.2	7.1	95.8
LBW	1.2	2.6	0.6	1.4	2.9	98.6

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



Initial Production Sample (IPS)

Coarseness Factor:	Workability Factor:	IPS
67	35	
Sieve		
2"	100.0	0.0
1.5"	100.0	0.0
1"	85.0	15.0
3/4"	72.3	12.7
1/2"	64.5	7.8
3/8"	56.5	8.0
#4	42.7	13.8
#8	34.9	7.8
#16	29.0	5.9
#30	21.0	8.0
#50	8.2	12.8
#100	1.6	6.5
LBW	0.7	0.9

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S02-Superior Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 11/14/2021 - 11/20/2021

Report Date 11/19/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.8	%	95-100
	#8 (2.36mm)	78.1	%	65-95
	#16 (1.18mm)	62.3	%	35-75
	#30 (.6mm)	46.2	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.86		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.87	%	



Plant S02-Superior Hoover

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 11/14/2021 - 11/20/2021

Report Date 11/19/2021

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)	98.4	%	
	1/2" (12.5mm)	82.1	%	
	3/8" (9.5mm)	61.4	%	
	#4 (4.75mm)	18.1	%	
	#8 (2.36mm)	7.6	%	
	#16 (1.18mm)	5.0	%	
	#30 (.6mm)	4.1	%	
	#50 (.3mm)	3.8	%	
	#100 (.15mm)	3.4	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75um)	2.6	%	0-3
	Total Moisture	3.63	%	



Plant S02-Superior Hoover

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 11/14/2021 - 11/20/2021

Report Date 11/19/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	92.6	%	
	1" (25mm)	35.5	%	
	3/4" (19mm)	9.1	%	
	1/2" (12.5mm)	1.7	%	
	3/8" (9.5mm)	1.5	%	
	#4 (4.75mm)	1.5	%	
	#8 (2.36mm)	1.4	%	
	#16 (1.18mm)	1.4	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75µm)	1.2	%	0-2
	Total Moisture	1.03	%	