

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

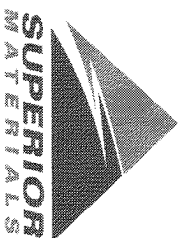
Sample Date: **5/9/22**

Dates Test Represents: **5/10/2022** through **5/16/2022**

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____

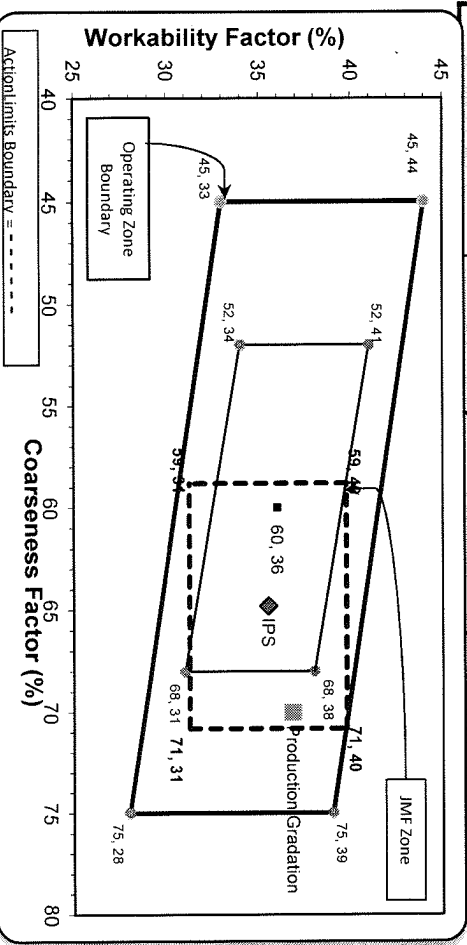


Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Cumulative % Passing	% Retained	Cumulative % Retained
CA	71-47	Presque Isle	1120	6.85	2.62	100.0	0.0	0.0
IA	71-47	Presque Isle	700	4.28	2.62	99.5	0.5	0.5
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7	13.5	14.0
			Total Wt	3070	18.69	100.0		
Sieve	CA		IA		NNS		Cumulative % Retained	
2"	100.0		100.0		100.0		0.0	
1.5"	98.6		100.0		100.0		0.5	
1"	61.7		100.0		100.0		13.5	
3/4"	19.7		99.2		100.0		15.5	
1/2"	5.2		81.2		100.0		9.4	
3/8"	3.7		60.1		100.0		5.4	
#4	3.0		16.6		96.8		11.5	
#8	2.7		6.6		84.3		7.5	
#16	2.5		4.5		69.0		6.8	
#30	2.3		3.9		50.1		7.9	
#50	2.2		3.6		24.4		10.6	
#100	2.0		3.3		7.1		7.2	
LBW	1.4		2.7		1.6		2.6	

Production Gradation: Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **70** Workability Factor: **37**



Initial Production Sample (IPS)

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

Coarseness Factor: **65**

Workability Factor: **36**

*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 958-JMT
 Product 1022-2NS GR - Smelter Bay
 Period: 05/08/2022 - 05/14/2022

Name/Title Doug Storey / QC Technician
 Report Date 05/12/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.8	%	95-100
	#8 (2.36mm)	84.3	%	65-95
	#16 (1.18mm)	69.0	%	35-75
	#30 (.6mm)	50.1	%	20-55
	#50 (.3mm)	24.4	%	10-30
	#100 (.15mm)	7.1	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.68		2.6-3
	Wash Loss (#200/75µm)	1.6	%	0-3
	Total Moisture	5.3	%	

Plant 958-JMT
 Product 7920-INTERMED AGG P1M LS PI
 Period: 05/13/2022 - 05/13/2022

Name/Title Doug Storey / QC Technician
 Report Date 05/13/2022

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)	99.2	%	
	1/2" (12.5mm)	81.2	%	
	3/8" (9.5mm)	60.1	%	
	#4 (4.75mm)	16.6	%	
	#8 (2.36mm)	6.6	%	
	#16 (1.18mm)	4.5	%	
	#30 (.6mm)	3.9	%	
	#50 (.3mm)	3.6	%	
	#100 (.15mm)	3.3	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75um)	2.7	%	0-3
	Total Moisture	3.6	%	

Edw. C. Levy Co.

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

Plant 958-JMT
Product 7919-COARSE AGG P1M LS PI
Period: 05/08/2022 - 05/14/2022

Name/Title Doug Storey / QC Technician
Report Date 05/13/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.6	%	
	1" (25mm)	61.7	%	
	3/4" (19mm)	19.7	%	
	1/2" (12.5mm)	5.2	%	
	3/8" (9.5mm)	3.7	%	
	#4 (4.75mm)	3.0	%	
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	1.8	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-35

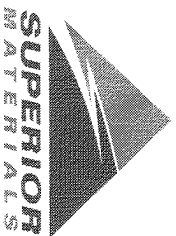
Sample Date: 5/9/22

Dates Test Represents: 5/10/2022 through 5/16/2022

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 ³	Specific Gravity	Contribution %
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
ZNS	81-019	Pleasant Lake	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

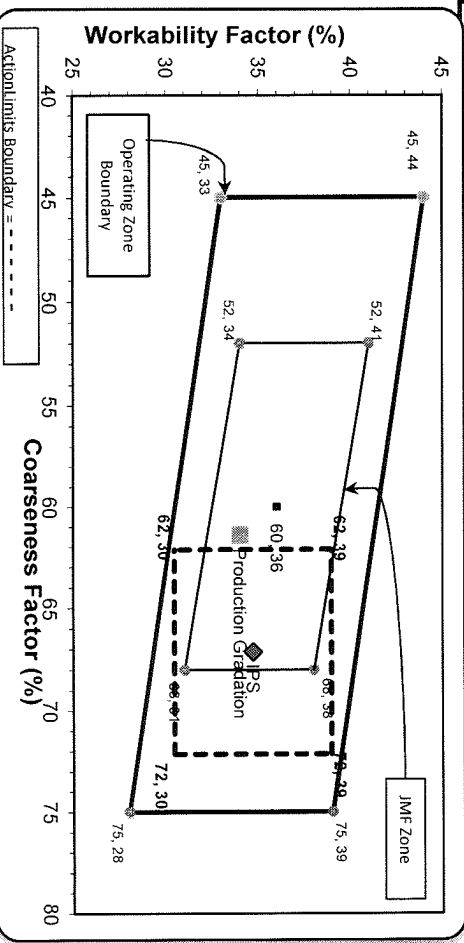
Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	71.7	100.0	100.0	87.6	12.4	12.4
3/4"	44.2	100.0	100.0	75.5	12.1	24.5
1/2"	24.9	92.8	100.0	65.8	9.7	34.2
3/8"	16.3	78.6	100.0	59.5	6.3	40.5
#4	5.2	30.4	96.6	44.8	14.7	55.2
#8	2.8	8.8	81.2	34.0	10.8	66.0
#16	2.3	4.3	65.5	27.0	7.1	73.0
#30	2.0	3.1	48.8	20.2	6.8	79.8
#50	1.8	2.7	21.4	9.5	10.7	90.5
#100	1.7	2.6	5.6	3.4	6.1	96.6
LBW	1.5	2.4	1.4	1.6	1.7	98.4

<----- 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

Initial Production Sample (IPS)



Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	61	34	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
Period: 05/08/2022 - 05/14/2022

Name/Title Doug Storey / QC Technician
Report Date 05/12/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.6	%	95-100
	#8 (2.36mm)	81.2	%	65-95
	#16 (1.18mm)	65.5	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	21.4	%	10-30
	#100 (.15mm)	5.6	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.81		2.6-3
AASHTO T11	-#200 (75um)	1.61	%	
	Wash Loss (#200/75um)	1.4	%	0-3
ASTM C566	Total Moisture	4.03	%	



Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/08/2022 - 05/14/2022

Report Date 05/12/2022

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)	92.8	%	
	3/8" (9.5mm)	78.6	%	
	#4 (4.75mm)	30.4	%	
	#8 (2.36mm)	8.8	%	
	#16 (1.18mm)	4.3	%	
	#30 (.6mm)	3.1	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.5	%	
	Wash Loss (#200/75um)	2.4	%	0-3
ASTM C566	Total Moisture	3.57	%	



Plant S35-Superior Romulus
Product 7919-COARSE AGG P1M LS
Period: 05/08/2022 - 05/14/2022

Name/Title Doug Storey / QC Technician
Report Date 05/12/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	71.7	%	
	3/4" (19mm)	44.2	%	
	1/2" (12.5mm)	24.9	%	
	3/8" (9.5mm)	16.3	%	
	#4 (4.75mm)	5.2	%	
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75µm)	1.5	%	0-2
ASTM C566	Total Moisture	2.49	%	