

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **12/5/22**

Dates Test Represents: **12/6/2022** through **12/12/2022**

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	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	850	5.20	2.62	27.7
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
			Total Wt	3070		100.0

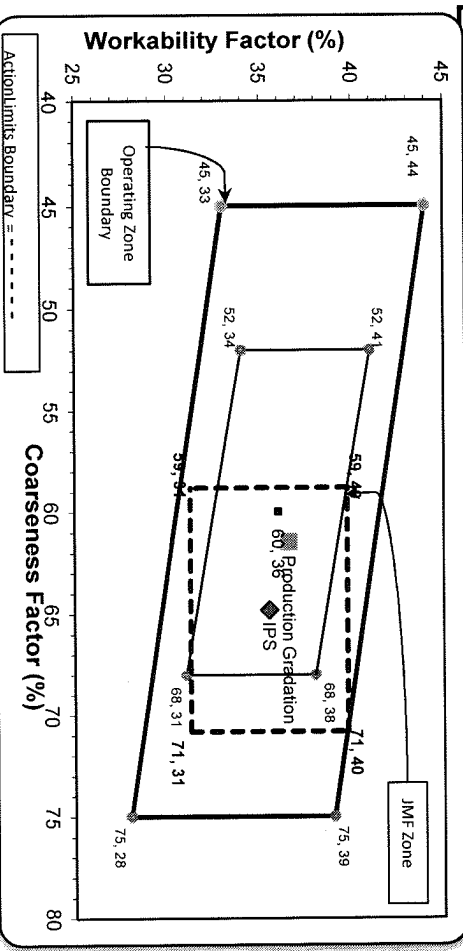
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.7	100.0	100.0	98.3	1.7	1.7
1"	36.8	100.0	100.0	80.0	18.3	20.0
3/4"	6.5	100.0	98.3	70.0	10.0	30.0
1/2"	1.6	83.8	100.0	64.4	5.6	35.6
3/8"	1.6	71.5	100.0	61.0	3.4	39.0
#4	1.6	18.3	98.4	45.6	15.4	54.4
#8	1.5	6.6	84.2	36.6	9.1	63.4
#16	1.4	4.3	67.9	29.3	7.3	70.7
#30	1.4	3.7	49.9	21.8	7.5	78.2
#50	1.3	3.4	24.6	11.4	10.4	88.6
#100	1.1	3.1	7.3	4.2	7.2	95.8
LBW	1.0	2.8	1.8	1.8	2.4	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: **61** Workability Factor: **37**



Initial Production Sample (IPS)

Coarseness Factor:	Workability Factor:
65	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

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Edw. C. Levy Co.

Basic Quality Statistical Summary Report

Plant 958-JMT
Product 1022-2NS GR - Smelter Bay
Specification 2NS GR Spec
Period 12/04/2022 - 12/10/2022

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	98.4			95-100
#8 (2.36mm)	1	84.2			65-95
#16 (1.18mm)	1	67.9			35-75
#30 (.6mm)	1	49.9			20-55
#50 (.3mm)	1	24.6		18-28	10-30
#100 (.15mm)	1	7.3			0-10
#200 (75µm)	1	2.0			
Pan	1	0.0			
FM	1	2.68		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	1.8			0-3
Total Moisture	1	4.1			

Edw. C. Levy Co.

Basic Quality Statistical Summary Report

Plant 958-JMT
Product 7920-INTERMED AGG P1M LS PI
Specification Intermed Agg P1M LS PI Target
Period 12/04/2022 - 12/10/2022

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			
1" (25mm)	1	100.0		100-100	
3/4" (19mm)	1	98.3		98-100	
1/2" (12.5mm)	1	83.8		72-92	
3/8" (9.5mm)	1	71.5		39-68	
#4 (4.75mm)	1	18.3		2-23	
#8 (2.36mm)	1	6.6			
#16 (1.18mm)	1	4.3			
#30 (.6mm)	1	3.7			
#50 (.3mm)	1	3.4			
#100 (.15mm)	1	3.1			
#200 (75µm)	1	2.9		0-3	
Pan	1	0.0			
Wash Loss (#200/75um)	1	2.8			0-3
Total Moisture	1	3.6			

Edw. C. Levy Co.

Basic Quality Statistical Summary Report

Plant 958-JMT
Product 7919-COARSE AGG P1M LS PI
Specification Coarse Agg P1M LS PI Target
Period 12/04/2022 - 12/10/2022

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0		100-100	
1 1/2" (37.5mm)	1	94.7		93-100	
1" (25mm)	1	36.8		35-55	
3/4" (19mm)	1	6.5		8-24	
1/2" (12.5mm)	1	1.6		0-6	
3/8" (9.5mm)	1	1.6		0-5	
#4 (4.75mm)	1	1.6		0-3	
#8 (2.36mm)	1	1.5			
#16 (1.18mm)	1	1.4			
#30 (.6mm)	1	1.4			
#50 (.3mm)	1	1.3			
#100 (.15mm)	1	1.1			
#200 (75µm)	1	1.1		0-2	
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.0			0-2
Total Moisture	1	1.7			

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-35**

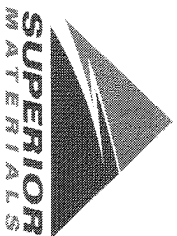
Sample Date: 12/5/22

Dates Test Represents: 12/6/2022 through 12/12/2022

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



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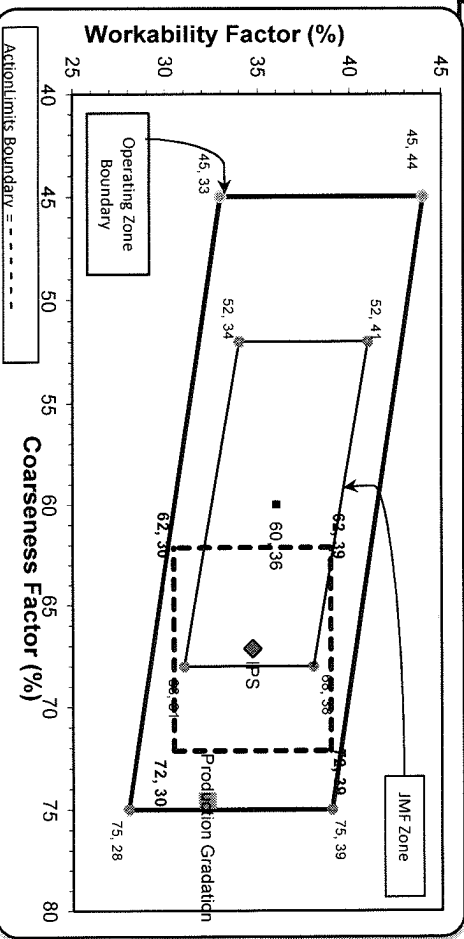
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
NNS	81-019	Pleasant Lake	1200	7.26	2.65	38.5
			Total Wt	3120	18.70	100.0

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.1	100.0	100.0	97.8	2.2	2.2
1"	43.0	100.0	100.0	75.0	22.9	25.0
3/4"	11.7	100.0	100.0	61.1	13.9	38.9
1/2"	3.4	77.9	100.0	53.7	7.4	46.3
3/8"	2.6	56.1	100.0	49.5	4.2	50.5
#4	2.3	15.0	97.1	41.0	8.5	59.0
#8	2.3	5.3	78.8	32.3	8.7	67.7
#16	2.3	3.4	61.9	25.4	6.8	74.6
#30	2.3	2.9	46.9	19.6	5.9	80.4
#50	2.2	2.5	23.6	10.5	9.1	89.5
#100	1.8	2.1	4.6	2.9	7.6	97.1
LBW	1.4	1.5	1.0	1.3	1.7	98.7

*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: **75** Workability Factor: **32**



Initial Production Sample (PS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	86.9	13.1	13.1
3/4"	76.1	10.8	23.9
1/2"	63.7	12.4	36.3
3/8"	56.2	7.5	43.8
#4	43.2	13.0	56.8
#8	34.7	8.5	65.3
#16	27.5	7.2	72.5
#30	20.6	7.0	79.4
#50	9.0	11.6	91.0
#100	2.1	6.9	97.9
LBW	1.0	1.1	99.0

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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Basic Quality Statistical Summary Report

Plant S35-Superior Romulus
Product 1022-2NS GR
Specification 2NS GR Spec
Period 12/04/2022 - 12/10/2022

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	97.1			95-100
#8 (2.36mm)	1	78.8			65-95
#16 (1.18mm)	1	61.9			35-75
#30 (.6mm)	1	46.9		40-50	20-55
#50 (.3mm)	1	23.6			10-30
#100 (.15mm)	1	4.6			0-10
#200 (75µm)	1	1.0			
Pan	1	0.0			
FM	1	2.87		2.7-2.9	2.6-3
-#200 (75um)	1	0.96			
Wash Loss (#200/75um)	1	0.8			0-3
Total Moisture	1	3.67			



Basic Quality Statistical Summary Report

Plant S35-Superior Romulus
Product 7920-INTERMED AGG P1M LS
Specification Intermed Agg P1M LS Target
Period 12/04/2022 - 12/10/2022

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0			
1 1/2" (37.5mm)	1	100.0			
1" (25mm)	1	100.0		100-100	
3/4" (19mm)	1	99.1			
1/2" (12.5mm)	1	77.9			
3/8" (9.5mm)	1	56.1			
#4 (4.75mm)	1	15.0			
#8 (2.36mm)	1	5.3			
#16 (1.18mm)	1	3.4			
#30 (.6mm)	1	2.9			
#50 (.3mm)	1	2.5			
#100 (.15mm)	1	2.1			
#200 (75µm)	1	1.6		0-3	
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.5			0-3
Total Moisture	1	3.21			



Basic Quality Statistical Summary Report

Plant S35-Superior Romulus
Product 7919-COARSE AGG P1M LS
Specification Coarse Agg P1M LS Target
Period 12/04/2022 - 12/10/2022

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0		100-100	
1 1/2" (37.5mm)	1	95.1			
1" (25mm)	1	43.0			
3/4" (19mm)	1	11.7			
1/2" (12.5mm)	1	3.4			
3/8" (9.5mm)	1	2.6			
#4 (4.75mm)	1	2.3			
#8 (2.36mm)	1	2.3			
#16 (1.18mm)	1	2.3			
#30 (.6mm)	1	2.3			
#50 (.3mm)	1	2.2			
#100 (.15mm)	1	1.8			
#200 (75µm)	1	1.6		0-2	
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.4			0-2
Total Moisture	1	0.75			