

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-32**

Sample Date: **7/5/21**

Dates Test Represents: **7/6/2021** through **7/12/2021**

Concrete Grade: **P1M**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



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

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	700	4.28	2.62	22.8
IA	71-47	Presque Isle	1120	6.85	2.62	36.5
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
<b>Total Wt</b>			<b>3070</b>	<b>18.69</b>		<b>100.0</b>

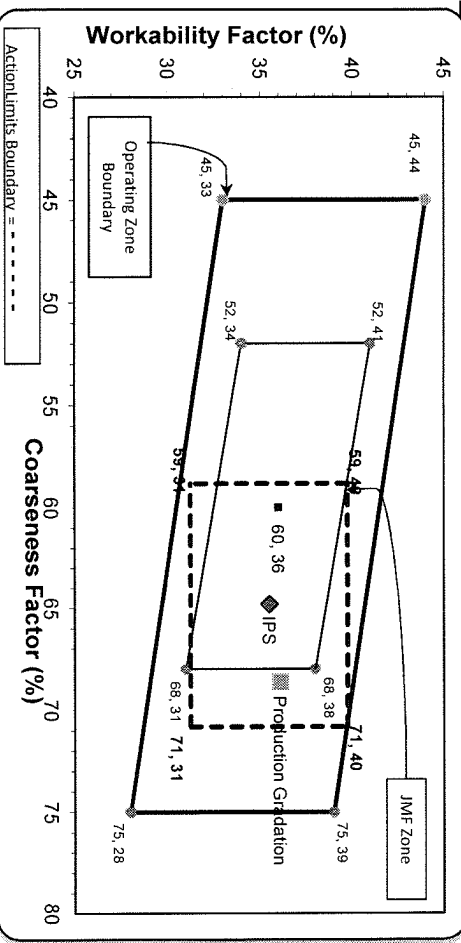
  

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.7	100.0	100.0	99.0	1.0	1.0
1"	52.9	100.0	100.0	89.3	9.8	10.7
3/4"	13.6	98.4	100.0	79.7	9.5	20.3
1/2"	5.0	72.6	100.0	68.3	11.4	31.7
3/8"	4.7	39.3	100.0	56.1	12.2	43.9
#4	2.8	7.8	96.6	42.8	13.3	57.2
#8	2.6	3.3	84.2	36.1	6.7	63.9
#16	2.5	2.4	72.2	30.8	5.2	69.2
#30	2.3	2.2	48.1	20.9	9.9	79.1
#50	2.2	2.1	19.5	9.2	11.7	90.8
#100	2.1	1.9	4.5	3.0	6.2	97.0
LBW	1.6	1.5	1.8	1.6	1.4	98.4

\*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: **69** 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

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 07/04/2021 - 07/10/2021

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	96.6			95-100
#8 (2.36mm)	1	84.2			65-95
#16 (1.18mm)	1	72.2			35-75
#30 (.6mm)	1	48.1			20-55
#50 (.3mm)	1	19.5		18-28	10-30
#100 (.15mm)	1	4.5			0-10
#200 (75µm)	1	2.0			
Pan	1	0.0			
FM	1	2.75		2.7-2.9	2.6-3
Wash Loss (#200/75um)	1	1.8			0-3
Total Moisture	1	4.8			

# 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** 07/04/2021 - 07/10/2021

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	98.4		98-100	
1/2" (12.5mm)	1	72.6		72-92	
3/8" (9.5mm)	1	39.3		39-68	
#4 (4.75mm)	1	7.8		2-23	
#8 (2.36mm)	1	3.3			
#16 (1.18mm)	1	2.4			
#30 (.6mm)	1	2.2			
#50 (.3mm)	1	2.1			
#100 (.15mm)	1	1.9			
#200 (75µm)	1	1.7		0-3	
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.5			0-3
Total Moisture	1	2.7			

# 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** 07/04/2021 - 07/10/2021

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0		100-100	
1 1/2" (37.5mm)	1	95.7		93-100	
1" (25mm)	1	52.9		35-55	
3/4" (19mm)	1	13.6		8-24	
1/2" (12.5mm)	1	5.0		0-6	
3/8" (9.5mm)	1	4.7		0-5	
#4 (4.75mm)	1	2.8		0-3	
#8 (2.36mm)	1	2.6			
#16 (1.18mm)	1	2.5			
#30 (.6mm)	1	2.3			
#50 (.3mm)	1	2.2			
#100 (.15mm)	1	2.1			
#200 (75µm)	1	1.8		0-2	
Pan	1	0.0			
Wash Loss (#200/75µm)	1	1.6			0-2
Total Moisture	1	1.6			

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-35**

Sample Date: **7/5/21**

Dates Test Represents: **7/6/2021** through **7/12/2021**

Concrete Grade: **P1M**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

Agg. Class	Pit #	Source	Weight (ssd)	ft <sup>3</sup>	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	81-093	Burnmeister	1200	7.26	2.65	38.5
Total Wt						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"	68.0	100.0	100.0	85.9	14.1	14.1
3/4"	32.0	100.0	100.0	70.1	15.8	29.9
1/2"	11.0	91.3	100.0	59.4	10.8	40.6
3/8"	5.0	69.2	100.0	52.9	6.5	47.1
#4	2.0	22.5	97.0	42.2	10.7	57.8
#8	1.6	8.2	84.5	34.6	7.5	65.4
#16	1.4	4.3	67.3	27.3	7.4	72.7
#30	1.3	3.1	44.0	18.0	9.2	82.0
#50	1.3	2.5	14.0	6.4	11.6	93.6
#100	1.2	2.2	0.9	1.3	5.1	98.7
LBW	1.0	1.4	1.0	1.1	0.2	98.9

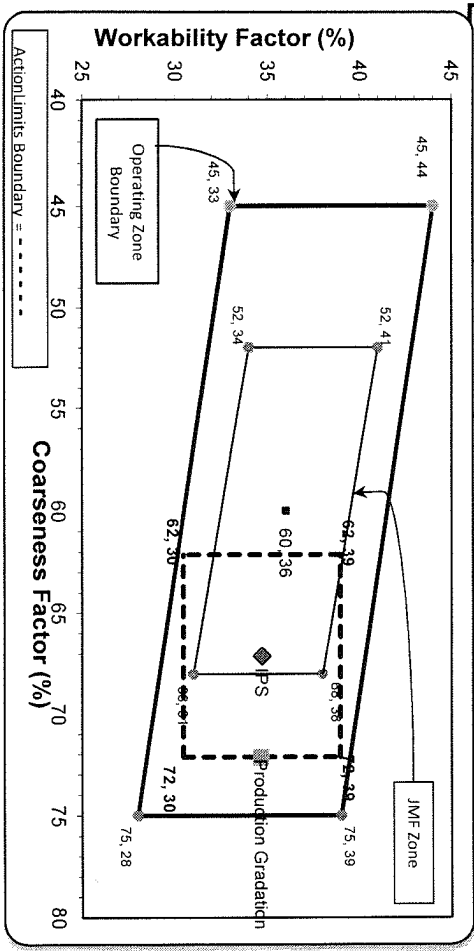


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\*Maximum % Retained must be above the 3/8" sieve.  
\*Any two adjacent sieves must equal 10% except max.  
nom. max. #100 and #200 sieves.  
\*% Retained must be at least 4% for each sieve except max.  
nom. max. #100 and #200 sieves.  
\*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. 1.5") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Coarseness Factor: **72** Workability Factor: **35**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	67	35	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

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** 07/04/2021 - 07/10/2021

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	97.0			95-100
#8 (2.36mm)	1	84.5			65-95
#16 (1.18mm)	1	67.3			35-75
#30 (.6mm)	1	44.0		40-50	20-55
#50 (.3mm)	1	14.0			10-30
#100 (.15mm)	1	2.9			0-10
#200 (75µm)	1	1.2			
Pan	1	0.0			
FM	1	2.90		2.7-2.9	2.6-3
-#200 (75um)	1	1.18			
Wash Loss (#200/75um)	1	1.0			0-3
Total Moisture	1	6.07			



## Basic Quality Statistical Summary Report

**Plant** S35-Superior Romulus  
**Product** 7920-INTERMED AGG P1M LS  
**Specification** Intermed Agg P1M LS Target  
**Period** 07/04/2021 - 07/10/2021

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	100.0			
1/2" (12.5mm)	1	91.3			
3/8" (9.5mm)	1	69.2			
#4 (4.75mm)	1	22.5			
#8 (2.36mm)	1	8.2			
#16 (1.18mm)	1	4.3			
#30 (.6mm)	1	3.1			
#50 (.3mm)	1	2.5			
#100 (.15mm)	1	2.2			
#200 (75µm)	1	1.7		0-3	
Pan	1	0.0			
Wash Loss (#200/75µm)	1	1.4			0-3
Total Moisture	1	3.87			



# Basic Quality Statistical Summary Report

**Plant** S35-Superior Romulus  
**Product** 7919-COARSE AGG P1M LS  
**Specification** Coarse Agg P1M LS Target  
**Period** 07/04/2021 - 07/10/2021

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0		100-100	
1 1/2" (37.5mm)	1	100.0			
1" (25mm)	1	68.0			
3/4" (19mm)	1	32.0			
1/2" (12.5mm)	1	11.0			
3/8" (9.5mm)	1	5.0			
#4 (4.75mm)	1	2.0			
#8 (2.36mm)	1	1.6			
#16 (1.18mm)	1	1.4			
#30 (.6mm)	1	1.3			
#50 (.3mm)	1	1.3			
#100 (.15mm)	1	1.2			
#200 (75µm)	1	1.2		0-2	
Pan	1	0.0			