

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

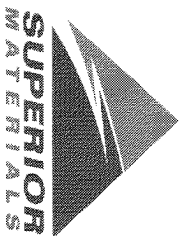
Sample Date: 11/1/21

Dates Test Represents: 11/2/2021 through 11/8/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



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

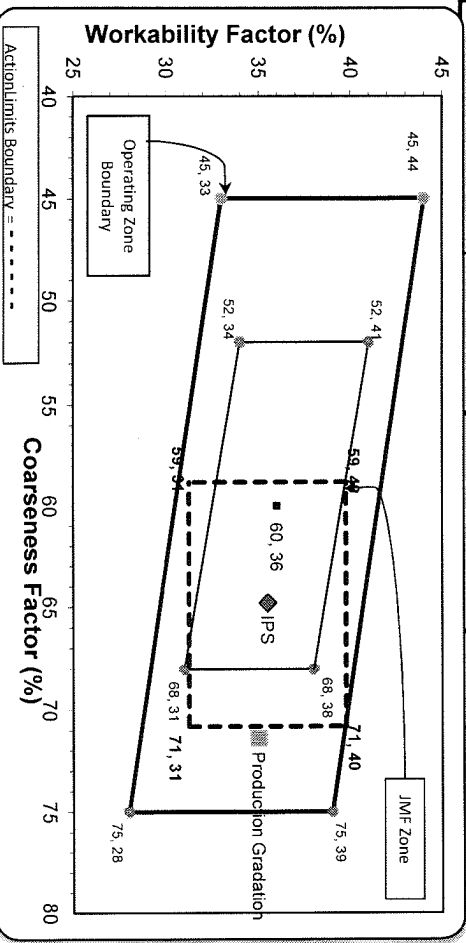
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
ZNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

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"	42.3	100.0	100.0	82.1	17.9	17.9
3/4"	9.5	97.2	100.0	71.2	10.9	28.8
1/2"	2.3	67.2	100.0	60.5	10.7	39.5
3/8"	1.8	43.5	100.0	53.6	6.9	46.4
#4	1.6	10.2	95.0	42.1	11.5	57.9
#8	1.6	4.8	81.4	35.0	7.1	65.0
#16	1.5	3.3	65.3	28.0	7.0	72.0
#30	1.4	2.9	48.0	20.8	7.2	79.2
#50	1.3	2.6	23.3	10.6	10.2	89.4
#100	1.3	2.4	6.6	3.8	6.9	96.2
LBW	1.0	1.8	0.3	0.9	2.8	99.1

*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: **71** Workability Factor: **35**



Initial Production Sample (IP)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	65	36	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: 10/31/2021 - 11/06/2021

Report Date 11/02/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.0	%	95-100
	#8 (2.36mm)	81.4	%	65-95
	#16 (1.18mm)	65.3	%	35-75
	#30 (.6mm)	48.0	%	20-55
	#50 (.3mm)	23.3	%	10-30
	#100 (.15mm)	6.6	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.80		2.6-3
	Wash Loss (#200/75um)	0.3	%	0-3
	Total Moisture	5.0	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/31/2021 - 11/06/2021

Report Date 11/05/2021

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)	97.2	%	
	1/2" (12.5mm)	67.2	%	
	3/8" (9.5mm)	43.5	%	
	#4 (4.75mm)	10.2	%	
	#8 (2.36mm)	4.8	%	
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.2	%	

Edw. C. Levy Co.

JMT
 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: 10/31/2021 - 11/06/2021

Report Date 11/05/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	42.3	%	
	3/4" (19mm)	9.5	%	
	1/2" (12.5mm)	2.3	%	
	3/8" (9.5mm)	1.8	%	
	#4 (4.75mm)	1.6	%	
	#8 (2.36mm)	1.6	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.3	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.6	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-35**

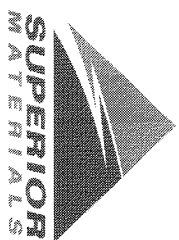
Sample Date: 11/1/21

Dates Test Represents: 11/2/2021 through 11/8/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



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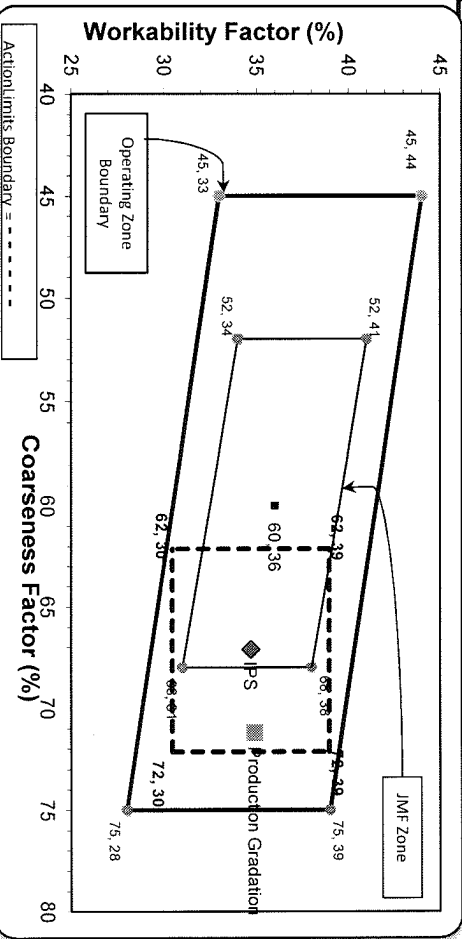
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	17.6
N2S	81-093	Burnmeister	1200	7.26	2.65	38.5
		Total Wt	3120	18.70		100.0

Sieve	CA	IA	N2S	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"	57.8	100.0	100.0	81.5	18.5	18.5
3/4"	29.4	100.0	100.0	69.0	31.0	31.0
1/2"	14.8	88.7	100.0	60.6	39.4	39.4
3/8"	9.8	61.7	100.0	53.6	46.4	46.4
#4	2.7	15.8	98.6	41.9	58.1	58.1
#8	1.5	5.3	86.6	34.9	65.1	65.1
#16	1.2	3.1	71.9	28.7	71.3	71.3
#30	1.1	2.5	49.6	20.0	80.0	80.0
#50	1.0	2.2	21.6	9.1	90.9	90.9
#100	0.9	2.1	4.4	2.5	97.5	97.5
LBW	0.7	1.7	0.9	1.0	99.0	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.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **71** Workability Factor: **35**



Initial Production Sample (IPS)

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: _____



Plant S35-Superior Romulus

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/31/2021 - 11/06/2021

Report Date 11/05/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.6	%	95-100
	#8 (2.36mm)	86.6	%	65-95
	#16 (1.18mm)	71.9	%	35-75
	#30 (.6mm)	49.6	%	20-55
	#50 (.3mm)	21.6	%	10-30
	#100 (.15mm)	4.4	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.67		2.6-3
AASHTO T11	-#200 (75um)	1.24	%	
	Wash Loss (#200/75um)	0.9	%	0-3
ASTM C566	Total Moisture	6.22	%	



Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/31/2021 - 11/06/2021

Report Date 11/05/2021

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)	100.0	%	
	1/2" (12.5mm)	88.7	%	
	3/8" (9.5mm)	61.7	%	
	#4 (4.75mm)	15.8	%	
	#8 (2.36mm)	5.3	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.7	%	0-3
ASTM C566	Total Moisture	3.76	%	



Plant S35-Superior Romulus

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/31/2021 - 11/06/2021

Report Date 11/05/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	57.8	%	
	3/4" (19mm)	29.4	%	
	1/2" (12.5mm)	14.8	%	
	3/8" (9.5mm)	9.8	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.2	%	
	#30 (.6mm)	1.1	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.8	%	
	Wash Loss (#200/75um)	0.7	%	0-2
ASTM C566	Total Moisture	2.75	%	