

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

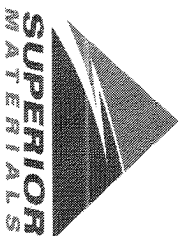
Sample Date: 3/22/21

Dates Test Represents: 3/23/2021 through 3/29/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



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

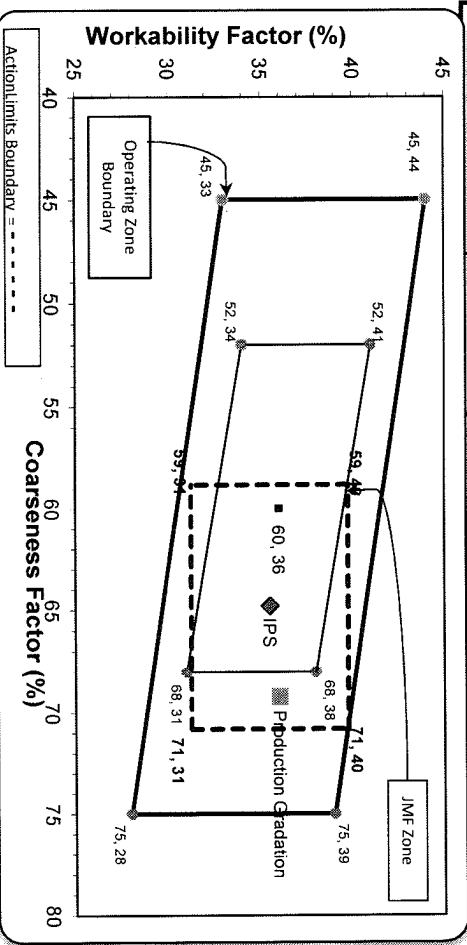
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	800	4.89	2.62	26.1
N2S	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt						18.69
Total Wt						100.0

Sieve	CA	IA	N2S	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.0	100.0	100.0	98.7	1.3	1.3
1"	46.0	100.0	100.0	82.1	16.6	17.9
3/4"	13.9	97.7	100.0	70.8	11.3	29.2
1/2"	4.9	77.5	100.0	62.5	8.3	37.5
3/8"	3.8	52.7	100.0	55.7	6.8	44.3
#4	2.8	10.6	96.4	42.9	12.8	57.1
#8	2.5	4.1	83.8	36.0	6.9	64.0
#16	2.3	3.1	68.0	29.3	6.8	70.7
#30	2.1	2.8	44.5	19.5	9.7	80.5
#50	1.9	2.5	18.7	8.9	10.6	91.1
#100	1.8	2.4	4.3	3.0	5.9	97.0
LBW	1.4	1.8	1.0	1.3	1.6	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: **69** Workability Factor: **36**



Initial Production Sample (IPS)

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: _____

Edw. C. Levy Co.

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

Plant: 958-JMT

Product: 1022-2NS GR - Smelter Bay

Period: 03/01/2021 - 03/26/2021

Name/Title: Doug Storey / QC Technician

Report Date: 03/26/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	83.8	%	65-95
	#16 (1.18mm)	68.0	%	35-75
	#30 (.6mm)	44.5	%	20-55
	#50 (.3mm)	18.7	%	10-30
	#100 (.15mm)	4.3	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.84		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.6	%	

Plant: 958-JMT
 Product: 7920-INTERMED AGG P1M LS PI
 Period: 03/01/2021 - 03/26/2021

Name/Title: Doug Storey / QC Technician
 Report Date: 03/26/2021

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)	97.7	%	
	1/2" (12.5mm)	77.5	%	
	3/8" (9.5mm)	52.7	%	
	#4 (4.75mm)	10.6	%	
	#8 (2.36mm)	4.1	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	2.5	%	

Plant 958-JMT
 Product 7919-COARSE AGG P1M LS PI
 Period: 03/01/2021 - 03/26/2021

Name/Title Doug Storey / QC Technician
 Report Date 03/26/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.0	%	
	1" (25mm)	46.0	%	
	3/4" (19mm)	13.9	%	
	1/2" (12.5mm)	4.9	%	
	3/8" (9.5mm)	3.8	%	
	#4 (4.75mm)	2.8	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	1.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

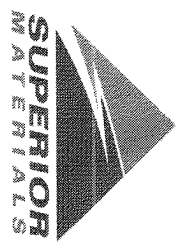
Contractor: _____

Sample Date: **3/22/21**

Concrete Grade: **P1M**

Dates Test Represents: **3/23/2021** through **3/29/2021**

MDOT No.: _____



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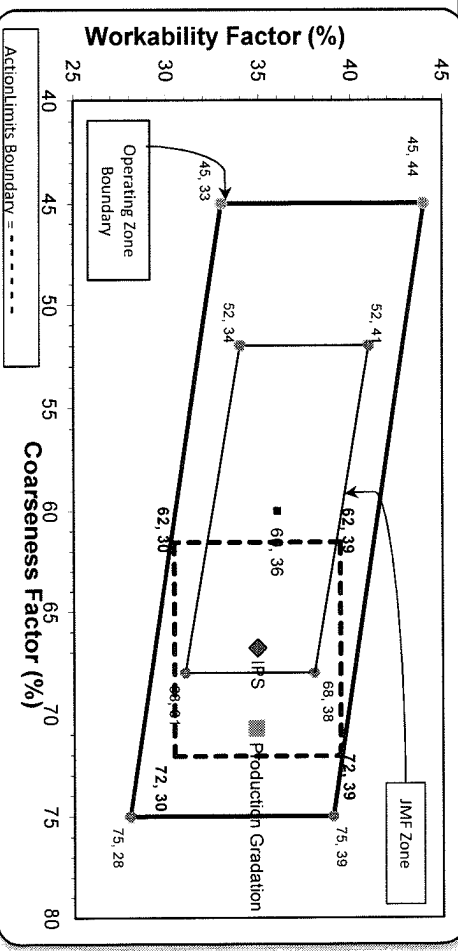
Aggr. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
ZNS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.4	100.0	100.0	98.8	1.2	1.2
1"	41.0	100.0	100.0	80.4	18.4	19.6
3/4"	12.6	98.8	100.0	70.6	9.8	29.4
1/2"	3.7	75.3	100.0	61.2	9.5	38.8
3/8"	3.0	50.0	100.0	53.9	7.2	46.1
#4	2.4	10.8	97.7	42.0	12.0	58.0
#8	2.1	4.3	84.3	34.8	7.1	65.2
#16	2.0	2.9	68.3	28.2	6.7	71.8
#30	1.9	2.5	47.7	20.0	8.2	80.0
#50	1.7	2.2	20.3	9.1	10.9	90.9
#100	1.6	1.9	3.6	2.5	6.6	97.5
LBW	1.3	1.6	1.1	1.3	1.2	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: **71** Workability Factor: **35**



Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	67	35	0.0	0.0
1.5"			0.0	0.0
1"			15.0	15.0
3/4"			12.9	27.9
1/2"			7.6	35.5
3/8"			8.0	43.5
#4			13.8	57.3
#8			7.8	65.1
#16			5.9	71.0
#30			8.0	79.0
#50			12.8	91.8
#100			6.5	98.4
LBW			0.9	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Basic Quality Statistical Summary Report

Plant S36-Superior Auburn Hills
Product 1022-2NS GR
Specification 2NS GR Spec
Period 03/14/2021 - 03/20/2021

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	1	100.0			100-100
#4 (4.75mm)	1	97.7			95-100
#8 (2.36mm)	1	84.3			65-95
#16 (1.18mm)	1	68.3			35-75
#30 (.6mm)	1	47.7		40-50	20-55
#50 (.3mm)	1	20.3			10-30
#100 (.15mm)	1	3.6			0-10
#200 (75µm)	1	1.1			
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.1			0-3



Basic Quality Statistical Summary Report

Plant S36-Superior Auburn Hills
Product 7920-INTERMED AGG P1M LS
Specification Intermed Agg P1M LS Target
Period 03/14/2021 - 03/20/2021

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	98.8			
1/2" (12.5mm)	1	75.3			
3/8" (9.5mm)	1	50.0			
#4 (4.75mm)	1	10.8			
#8 (2.36mm)	1	4.3			
#16 (1.18mm)	1	2.9			
#30 (.6mm)	1	2.5			
#50 (.3mm)	1	2.2			
#100 (.15mm)	1	1.9			
#200 (75µm)	1	1.6		0-3	
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.6			0-3



Basic Quality Statistical Summary Report

Plant S36-Superior Auburn Hills
Product 7919-COARSE AGG P1M LS
Specification Coarse Agg P1M LS Target
Period 03/14/2021 - 03/20/2021

Sieve/Test	Tests	Average	St Dev	Target	Specification
2" (50mm)	1	100.0		100-100	
1 1/2" (37.5mm)	1	96.4			
1" (25mm)	1	41.0			
3/4" (19mm)	1	12.6			
1/2" (12.5mm)	1	3.7			
3/8" (9.5mm)	1	3.0			
#4 (4.75mm)	1	2.4			
#8 (2.36mm)	1	2.1			
#16 (1.18mm)	1	2.0			
#30 (.6mm)	1	1.9			
#50 (.3mm)	1	1.7			
#100 (.15mm)	1	1.6			
#200 (75µm)	1	1.3		0-2	
Pan	1	0.0			
Wash Loss (#200/75um)	1	1.3			0-2