

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: 7/19/21

Dates Test Represents: 7/20/2021 through 7/26/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

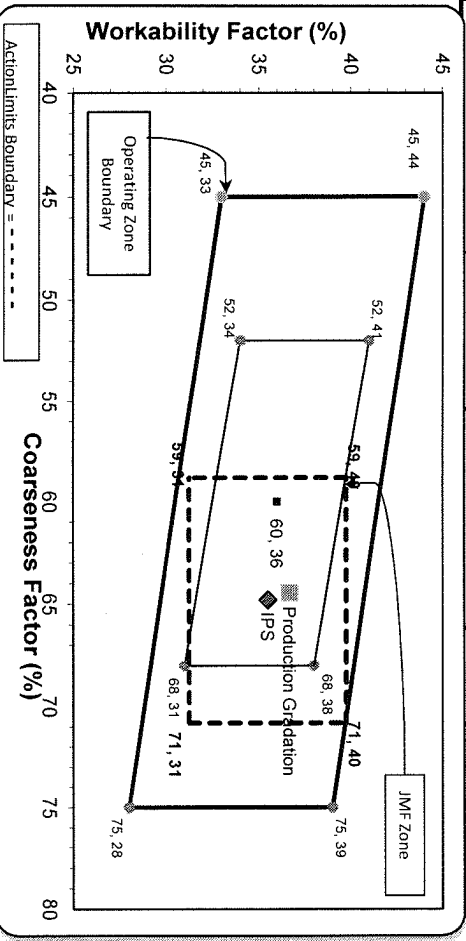


Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Cumulative % Passing
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
Total Wt			3070	18.69		100.0
Sieve	CA	IA	NNS	% Retained		
2"	100.0	100.0	100.0	0.0	0.0	0.0
1.5"	87.8	100.0	100.0	2.8	2.8	2.8
1"	40.8	100.0	100.0	10.7	13.5	13.5
3/4"	11.5	97.8	100.0	7.5	21.0	21.0
1/2"	2.1	75.0	100.0	10.5	31.4	31.4
3/8"	1.5	49.7	100.0	9.4	40.8	40.8
#4	1.2	14.8	96.0	14.4	55.2	55.2
#8	1.1	7.0	83.2	8.1	63.3	63.3
#16	0.9	4.8	68.4	6.9	70.2	70.2
#30	0.8	4.1	47.4	8.8	79.0	79.0
#50	0.7	3.8	23.3	9.9	89.0	89.0
#100	0.6	3.4	7.0	6.8	95.8	95.8
LBW	0.3	2.5	1.4	2.7	98.4	98.4

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **64** Workability Factor: **37**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	65	36	0.0	0.0
1.5"			0.6	0.6
1"			15.3	16.0
3/4"			10.5	26.5
1/2"			8.2	34.8
3/8"			7.1	41.8
#4			14.1	55.9
#8			8.6	64.5
#16			6.4	70.9
#30			7.3	78.1
#50			12.2	90.4
#100			7.1	97.4
LBW			1.6	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.

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT
 Product 1022-2NS GR - Smelter Bay
 Period: 07/18/2021 - 07/24/2021

Name/Title Doug Storey / QC Technician
 Report Date 07/24/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.0	%	95-100
	#8 (2.36mm)	83.2	%	65-95
	#16 (1.18mm)	68.4	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	23.3	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	5.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 07/18/2021 - 07/24/2021

Report Date 07/24/2021

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)	97.8	%	
	1/2" (12.5mm)	75.0	%	
	3/8" (9.5mm)	49.7	%	
	#4 (4.75mm)	14.8	%	
	#8 (2.36mm)	7.0	%	
	#16 (1.18mm)	4.8	%	
	#30 (.6mm)	4.1	%	
	#50 (.3mm)	3.8	%	
	#100 (.15mm)	3.4	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.8	%	

Edw. C. Levy Co.

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

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 07/18/2021 - 07/24/2021

Report Date 07/24/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	87.8	%	
	1" (25mm)	40.8	%	
	3/4" (19mm)	11.5	%	
	1/2" (12.5mm)	2.1	%	
	3/8" (9.5mm)	1.5	%	
	#4 (4.75mm)	1.2	%	
	#8 (2.36mm)	1.1	%	
	#16 (1.18mm)	0.9	%	
	#30 (.6mm)	0.8	%	
	#50 (.3mm)	0.7	%	
	#100 (.15mm)	0.6	%	
	#200 (75µm)	0.4	%	
	Wash Loss (#200/75um)	0.3	%	0-2
	Total Moisture	3.1	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-35**

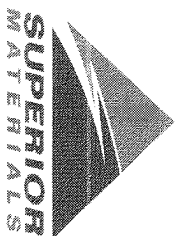
Sample Date: 7/19/21

Dates Test Represents: 7/20/2021 through 7/26/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



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

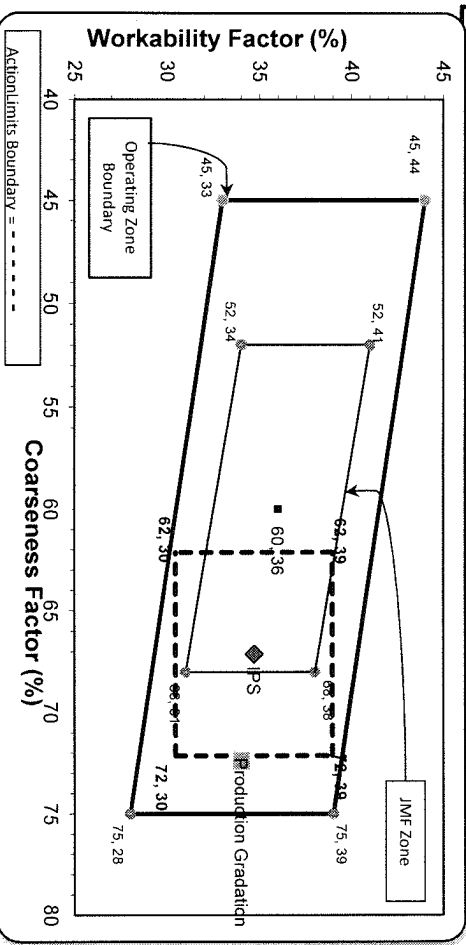
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1370	8.16	2.69	43.9
IA	58-003	Stoneco	550	3.28	2.69	18.5
NNS	81-093	Burnmeister	1200	7.26	2.65	38.5
Total Wt			3120	18.70		100.0

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	53.9	100.0	100.0	79.8	20.2	20.2
3/4"	21.8	100.0	100.0	65.7	34.3	34.3
1/2"	6.8	92.0	100.0	57.7	42.3	42.3
3/8"	3.2	70.1	100.0	52.2	47.8	47.8
#4	2.0	19.0	95.7	41.0	59.0	59.0
#8	1.8	5.1	84.0	34.0	66.0	66.0
#16	1.6	2.9	69.7	28.0	72.0	72.0
#30	1.5	2.3	49.2	20.0	80.0	80.0
#50	1.4	2.0	22.7	9.7	90.3	90.3
#100	1.4	1.8	6.5	3.4	96.6	96.6
LBW	1.1	1.3	1.1	1.1	98.9	98.9

*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: **34**



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: _____



Plant S35-Superior Romulus

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 07/18/2021 - 07/24/2021

Report Date 07/26/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	53.9	%	
	3/4" (19mm)	21.8	%	
	1/2" (12.5mm)	6.8	%	
	3/8" (9.5mm)	3.2	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.1	%	0-2
ASTM C566	Total Moisture	2.40	%	



Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Period: 07/18/2021 - 07/24/2021

Name/Title Doug Storey / QC Technician

Report Date 07/26/2021

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)	92.0	%	
	3/8" (9.5mm)	70.1	%	
	#4 (4.75mm)	19.0	%	
	#8 (2.36mm)	5.1	%	
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.3	%	0-3
ASTM C566	Total Moisture	2.96	%	



Plant S35-Superior Romulus

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 07/18/2021 - 07/24/2021

Report Date 07/24/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	84.0	%	65-95
	#16 (1.18mm)	69.7	%	35-75
	#30 (.6mm)	49.2	%	20-55
	#50 (.3mm)	22.7	%	10-30
	#100 (.15mm)	6.5	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.72		2.6-3
AASHTO T11	-#200 (75um)	1.40	%	
	Wash Loss (#200/75um)	1.1	%	0-3
ASTM C566	Total Moisture	3.88	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

Sample Date: 7/19/21

Dates Test Represents: 7/20/2021 through 7/26/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



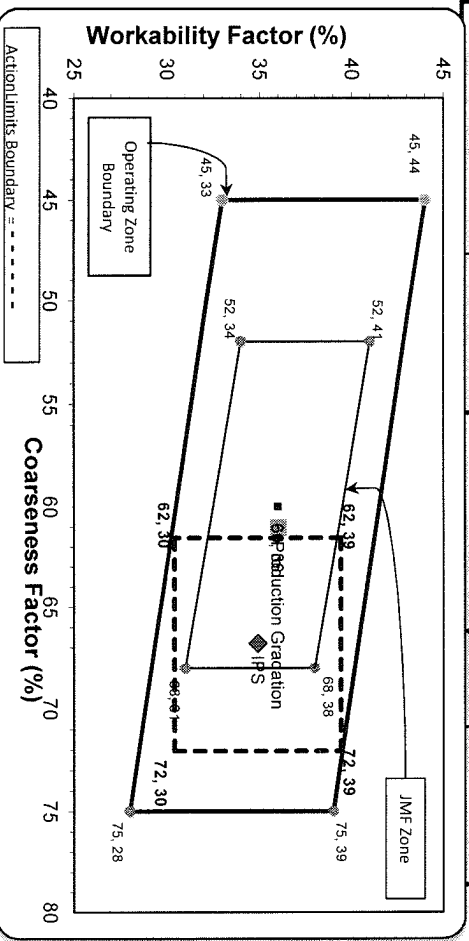
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	720	4.40	2.62	23.5
IA	71-47	Presque Isle	1150	7.03	2.62	37.5
NNS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt	3070	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"	94.5	100.0	100.0	98.7	1.3	1.3
1"	31.2	100.0	100.0	83.9	14.8	16.1
3/4"	6.1	98.8	100.0	77.5	6.3	22.5
1/2"	1.8	78.4	100.0	68.9	8.7	31.1
3/8"	1.8	57.2	100.0	60.9	7.9	39.1
#4	1.7	13.4	98.5	43.9	17.0	56.1
#8	1.7	4.9	86.4	36.0	7.9	64.0
#16	1.5	3.2	71.3	29.4	6.6	70.6
#30	1.4	2.8	52.5	21.9	7.5	78.1
#50	1.4	2.6	22.5	10.1	11.8	89.9
#100	1.3	2.5	3.7	2.7	7.4	97.3
LBW	0.9	1.8	0.7	1.2	1.5	98.8

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **61** Workability Factor: **36**



Initial Production Sample (IPS)

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

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	85.0	15.0	15.0
3/4"	72.1	12.9	27.9
1/2"	64.5	7.6	35.5
3/8"	56.5	8.0	43.5
#4	42.7	13.8	57.3
#8	34.9	7.8	65.1
#16	29.0	5.9	71.0
#30	21.0	8.0	79.0
#50	8.2	12.8	91.8
#100	1.6	6.5	98.4
LBW	0.7	0.9	99.3

*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: _____



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 07/18/2021 - 07/24/2021

Report Date 07/24/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.5	%	95-100
	#8 (2.36mm)	86.4	%	65-95
	#16 (1.18mm)	71.3	%	35-75
	#30 (.6mm)	52.5	%	20-55
	#50 (.3mm)	22.5	%	10-30
	#100 (.15mm)	3.7	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	0.7	%	0-3
	Total Moisture	3.25	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 07/18/2021 - 07/24/2021

Report Date 07/24/2021

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)	98.8	%	
	1/2" (12.5mm)	78.4	%	
	3/8" (9.5mm)	57.2	%	
	#4 (4.75mm)	13.4	%	
	#8 (2.36mm)	4.9	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	2.60	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
Product 7919-COARSE AGG P1M LS
Period: 07/18/2021 - 07/24/2021

Name/Title Doug Storey / QC Technician
Report Date 07/24/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.5	%	
	1" (25mm)	31.2	%	
	3/4" (19mm)	6.1	%	
	1/2" (12.5mm)	1.8	%	
	3/8" (9.5mm)	1.8	%	
	#4 (4.75mm)	1.7	%	
	#8 (2.36mm)	1.7	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.0	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	0.48	%	