

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-02**

Sample Date: **10/18/21**

Dates Test Represents: **10/19/2021** through **10/25/2021**

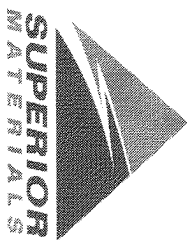
Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	960	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.2	0.8	0.8
1"	45.2	100.0	100.0	83.0	16.1	17.0
3/4"	13.8	99.6	100.0	73.2	9.8	26.8
1/2"	5.6	80.2	100.0	65.2	8.0	34.8
3/8"	5.0	57.1	100.0	58.4	6.7	41.6
#4	3.6	15.3	97.2	45.0	13.4	55.0
#8	3.0	5.9	78.4	34.5	10.5	65.5
#16	2.7	3.6	61.1	26.7	7.8	73.3
#30	2.6	2.9	46.2	20.4	6.3	79.6
#50	2.4	2.6	24.0	11.3	9.2	88.7
#100	2.2	2.3	6.2	3.9	7.4	96.1
LBW	1.7	1.5	0.5	1.2	2.7	98.8

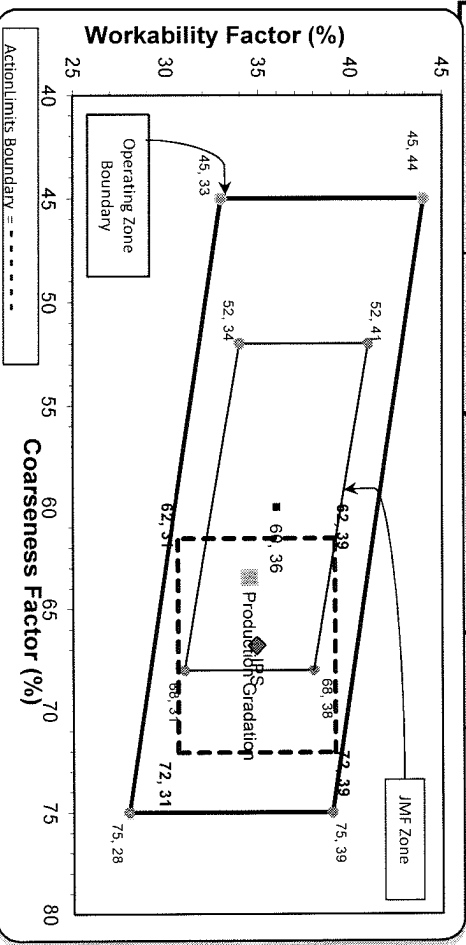


Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

*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: **63** 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"			85.0	15.0	15.0
3/4"			72.3	12.7	27.7
1/2"			64.5	7.8	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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S02-Superior Hoover

Product 1022-2NS GR

Period: 10/17/2021 - 10/23/2021

Name/Title Doug Storey / QC Technician

Report Date 10/22/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.2	%	95-100
	#8 (2.36mm)	78.4	%	65-95
	#16 (1.18mm)	61.1	%	35-75
	#30 (.6mm)	46.2	%	20-55
	#50 (.3mm)	24.0	%	10-30
	#100 (.15mm)	6.2	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.87		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	4.41	%	



Plant S02-Superior Hoover

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/17/2021 - 10/23/2021

Report Date 10/22/2021

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)	99.6	%	
	1/2" (12.5mm)	80.2	%	
	3/8" (9.5mm)	57.1	%	
	#4 (4.75mm)	15.3	%	
	#8 (2.36mm)	5.9	%	
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75µm)	1.5	%	0-3
	Total Moisture	2.05	%	



Plant S02-Superior Hoover

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 10/17/2021 - 10/23/2021

Report Date 10/22/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.3	%	
	1" (25mm)	45.2	%	
	3/4" (19mm)	13.8	%	
	1/2" (12.5mm)	5.6	%	
	3/8" (9.5mm)	5.0	%	
	#4 (4.75mm)	3.6	%	
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75µm)	1.7	%	0-2
	Total Moisture	2.08	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: 10/18/21

Dates Test Represents: 10/19/2021 through 10/25/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

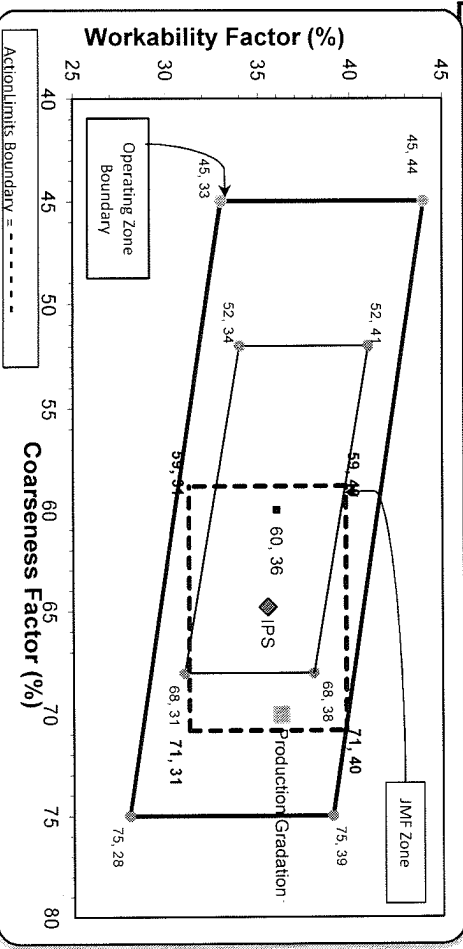
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt.			3070	18.69		100.0

Verify this number is 100%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.4	0.6	0.6
1"	37.1	100.0	100.0	80.5	18.9	19.5
3/4"	9.6	97.3	100.0	71.3	9.3	28.7
1/2"	3.3	71.7	100.0	62.1	9.2	37.9
3/8"	2.4	48.9	100.0	55.3	6.7	44.7
#4	1.9	10.9	96.3	42.9	12.4	57.1
#8	1.8	5.1	84.0	36.2	6.7	63.8
#16	1.8	3.3	67.7	29.1	7.1	70.9
#30	1.7	2.7	47.1	20.5	8.6	79.5
#50	1.7	2.4	21.5	10.0	10.5	90.0
#100	1.6	2.1	6.6	3.8	6.2	96.2
LBW	1.2	1.6	1.4	1.4	2.4	98.6

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

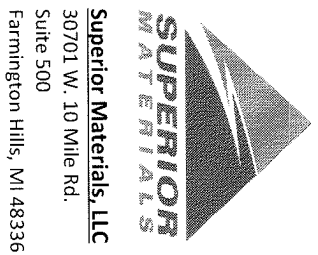
Coarseness Factor: **70** Workability Factor: **36**



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: _____

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 10/17/2021 - 10/23/2021

Report Date 10/22/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.3	%	95-100
	#8 (2.36mm)	84.0	%	65-95
	#16 (1.18mm)	67.7	%	35-75
	#30 (.6mm)	47.1	%	20-55
	#50 (.3mm)	21.5	%	10-30
	#100 (.15mm)	6.6	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.77		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	4.4	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/17/2021 - 10/23/2021

Report Date 10/22/2021

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)	97.3	%	
	1/2" (12.5mm)	71.7	%	
	3/8" (9.5mm)	48.9	%	
	#4 (4.75mm)	10.9	%	
	#8 (2.36mm)	5.1	%	
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	1.6	%	

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

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Period: 10/17/2021 - 10/23/2021

Name/Title Doug Storey / QC Technician

Report Date 10/22/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.2	%	
	1" (25mm)	37.1	%	
	3/4" (19mm)	9.6	%	
	1/2" (12.5mm)	3.3	%	
	3/8" (9.5mm)	2.4	%	
	#4 (4.75mm)	1.9	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75µm)	1.2	%	0-2
	Total Moisture	2.7	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-35**

Sample Date: 10/18/21

Dates Test Represents: 10/19/2021 through 10/25/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



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

Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	58-003	Stonoco	1370	8.16	2.69	43.9
IA	58-003	Stonoco	550	3.28	2.69	17.6
2NS	81-093	Burnmeister	1200	7.26	2.65	38.5
Total Wt.						100.0

Sieve	CA	IA	2NS	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"	63.2	100.0	100.0	83.8	16.2	16.2
3/4"	32.7	100.0	100.0	70.4	29.6	45.8
1/2"	16.8	95.0	100.0	62.6	37.4	83.2
3/8"	10.2	78.1	100.0	56.7	43.3	100.0
#4	2.7	28.2	99.0	44.2	55.8	100.0
#8	1.5	8.0	85.4	34.9	65.1	100.0
#16	1.3	3.8	67.8	27.3	72.7	100.0
#30	1.2	2.8	48.2	19.6	80.4	100.0
#50	1.1	2.4	16.5	7.3	92.7	100.0
#100	1.0	2.2	3.1	2.0	98.0	100.0
LBW	0.8	2.0	0.9	1.1	99.0	100.0

Production Gradation

Batch Plant Gradations

Aggregate Supplier Gradations

Coarseness Factor: **67**

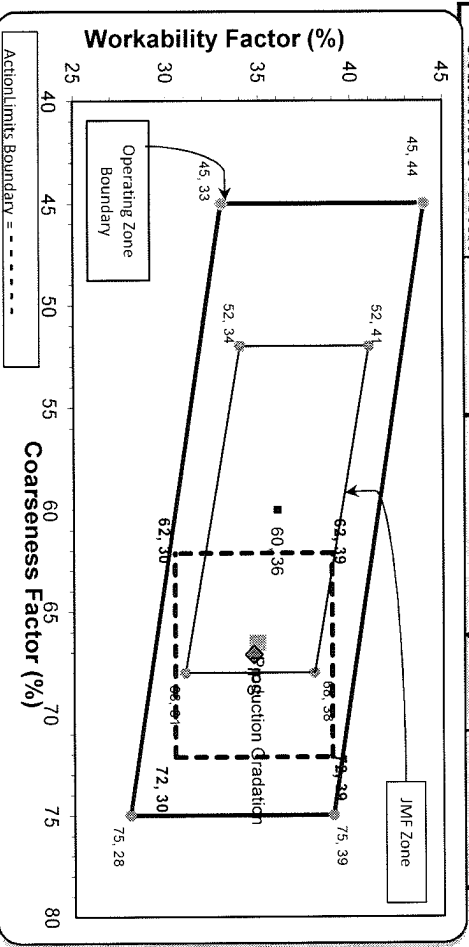
Workability Factor: **35**

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"	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 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/17/2021 - 10/23/2021

Report Date 10/22/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.0	%	95-100
	#8 (2.36mm)	85.4	%	65-95
	#16 (1.18mm)	67.8	%	35-75
	#30 (.6mm)	48.2	%	20-55
	#50 (.3mm)	16.5	%	10-30
	#100 (.15mm)	3.1	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.80		2.6-3
AASHTO T11	-#200 (75um)	1.04	%	
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	5.55	%	



Plant S35-Superior Romulus
 Product 7920-INTERMED AGG P1M LS
 Period: 10/17/2021 - 10/23/2021

Name/Title Doug Storey / QC Technician
 Report Date 10/22/2021

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)	95.0	%	
	3/8" (9.5mm)	78.1	%	
	#4 (4.75mm)	28.2	%	
	#8 (2.36mm)	8.0	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-3
ASTM C566	Total Moisture	3.54	%	



Plant S35-Superior Romulus
Product 7919-COARSE AGG P1M LS
Period: 10/17/2021 - 10/23/2021

Name/Title Doug Storey / QC Technician
Report Date 10/22/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	63.2	%	
	3/4" (19mm)	32.7	%	
	1/2" (12.5mm)	16.8	%	
	3/8" (9.5mm)	10.2	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75um)	0.8	%	0-2
ASTM C566	Total Moisture	2.04	%	