

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-12**

Contractor: _____

Sample Date: **5/3/21**

Concrete Grade: **P1M**

Dates Test Represents: **5/4/2021** through **5/10/2021**

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	900	5.50	2.62	29.3
IA	71-47	Presque Isle	920	5.63	2.62	30.0
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
Total Wt						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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	53.6	100.0	100.0	86.4	13.6	13.6
3/4"	10.8	98.7	100.0	73.5	26.5	40.1
1/2"	3.5	81.5	100.0	66.2	33.8	73.9
3/8"	3.0	60.3	100.0	59.7	40.3	84.2
#4	2.7	18.7	95.0	45.1	54.9	89.1
#8	2.3	7.2	81.2	35.9	64.1	93.2
#16	1.8	4.4	67.5	29.3	70.7	96.3
#30	1.8	3.6	52.4	22.9	77.1	97.4
#50	1.7	3.1	27.4	12.6	87.4	98.1
#100	1.4	2.7	6.7	3.9	96.1	98.5
LBW	0.9	2.0	1.8	1.6	98.4	99.1

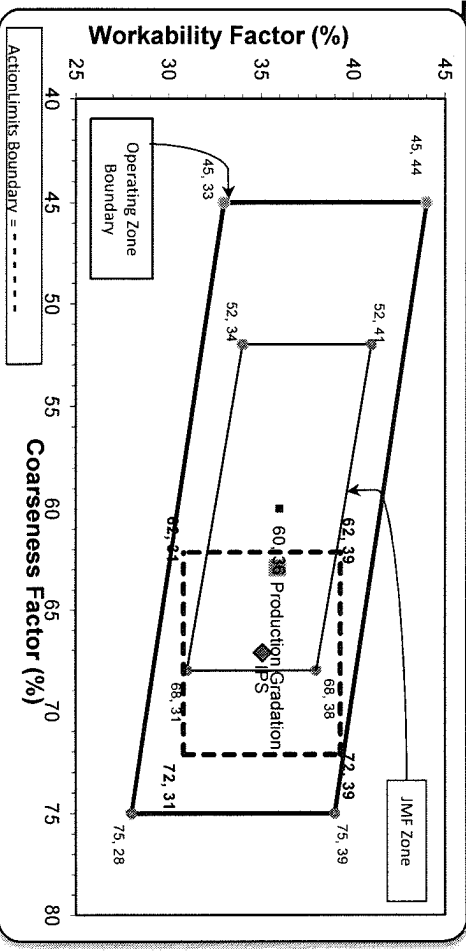
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **63** Workability Factor: **36**

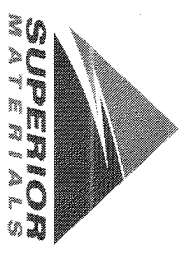
Coarseness Factor: **67** Workability Factor: **35**



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.0	9.8	26.0
1/2"	63.7	10.3	36.3
3/8"	56.4	7.3	43.6
#4	43.0	13.4	57.0
#8	35.1	7.9	64.9
#16	29.0	6.1	71.0
#30	20.9	8.0	79.1
#50	8.1	12.8	91.9
#100	1.6	6.5	98.4
LBW	0.9	0.8	99.1

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



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



Plant S12-Superior Onsite

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

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)	81.2	%	65-95
	#16 (1.18mm)	67.5	%	35-75
	#30 (.6mm)	52.4	%	20-55
	#50 (.3mm)	27.4	%	10-30
	#100 (.15mm)	6.7	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.92	%	



Plant S12-Superior Onsite

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

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)	98.7	%	
	1/2" (12.5mm)	81.5	%	
	3/8" (9.5mm)	60.3	%	
	#4 (4.75mm)	18.7	%	
	#8 (2.36mm)	7.2	%	
	#16 (1.18mm)	4.4	%	
	#30 (.6mm)	3.6	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	2.42	%	



Plant S12-Superior Onsite

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	53.6	%	
	3/4" (19mm)	10.8	%	
	1/2" (12.5mm)	3.5	%	
	3/8" (9.5mm)	3.0	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	0.71	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **5/3/21**

Dates Test Represents: **5/4/2021** through **5/10/2021**

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	800	4.89	2.62	26.1
IA	71-47	Presque Isle	1020	6.24	2.62	33.2
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		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"	94.4	100.0	100.0	98.5	1.5	1.5
1"	46.3	100.0	100.0	86.0	12.5	14.0
3/4"	9.7	98.6	100.0	76.0	10.0	24.0
1/2"	4.2	82.4	100.0	69.2	6.8	30.8
3/8"	3.1	59.3	100.0	61.2	8.0	38.8
#4	2.2	12.5	96.8	44.1	17.1	55.9
#8	2.1	4.4	83.2	35.9	8.3	64.1
#16	2.1	3.0	66.6	28.7	7.2	71.3
#30	2.1	2.7	41.4	18.3	10.4	81.7
#50	2.0	2.3	19.1	9.1	9.2	90.9
#100	2.0	2.1	4.0	2.8	6.2	97.2
LBW	1.8	1.6	1.5	1.6	1.2	98.4

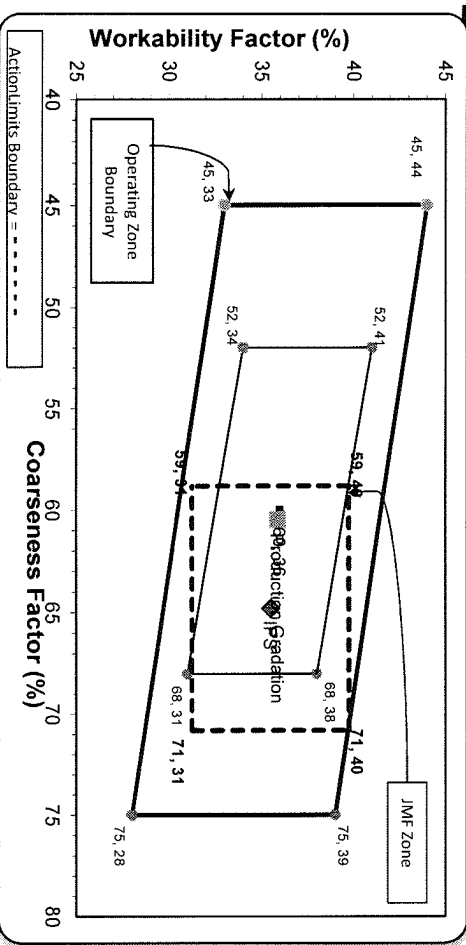


Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

*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. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **60** 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: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.8	%	95-100
	#8 (2.36mm)	83.2	%	65-95
	#16 (1.18mm)	66.6	%	35-75
	#30 (.6mm)	41.4	%	20-55
	#50 (.3mm)	19.1	%	10-30
	#100 (.15mm)	4.0	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.89		2.6-3
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	5.0	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

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)	98.6	%	
	1/2" (12.5mm)	82.4	%	
	3/8" (9.5mm)	59.3	%	
	#4 (4.75mm)	12.5	%	
	#8 (2.36mm)	4.4	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	2.1	%	

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.4	%	
	1" (25mm)	46.3	%	
	3/4" (19mm)	9.7	%	
	1/2" (12.5mm)	4.2	%	
	3/8" (9.5mm)	3.1	%	
	#4 (4.75mm)	2.2	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	1.8	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

Sample Date: **5/3/21**

Dates Test Represents: **5/4/2021** through **5/10/2021**

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
NNS	44-051	Krake Willis Rd	1250	7.56	2.65	40.7
Total Wt:						18.69
						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"	72.4	100.0	100.0	90.4	9.6	9.6
3/4"	24.8	100.0	100.0	73.8	16.6	26.2
1/2"	5.4	78.1	100.0	61.7	12.1	38.3
3/8"	3.5	57.0	100.0	55.9	5.8	44.1
#4	2.5	13.2	97.0	43.6	12.3	56.4
#8	2.4	4.9	77.2	33.5	10.1	66.5
#16	2.3	3.3	60.8	26.4	7.1	73.6
#30	2.3	3.0	45.2	19.9	6.4	80.1
#50	2.2	2.8	25.0	11.6	8.3	88.4
#100	2.1	2.6	6.3	3.9	7.7	96.1
LBW	1.8	2.2	0.9	1.5	2.4	98.5

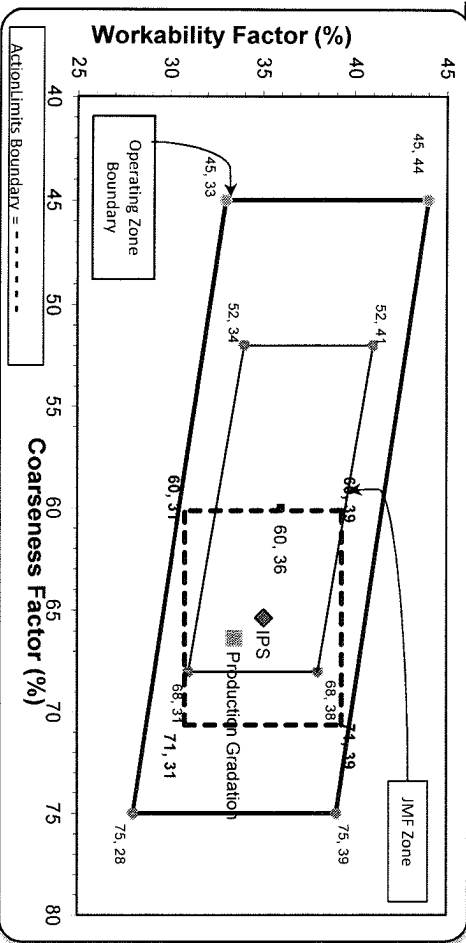


Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

*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. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **66** Workability Factor: **33**



Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.1	9.8	25.9
1/2"	64.3	9.7	35.7
3/8"	57.5	6.8	42.5
#4	44.5	13.1	55.5
#8	35.1	9.4	64.9
#16	27.9	7.2	72.1
#30	21.7	6.2	78.3
#50	12.6	9.1	87.4
#100	3.5	9.1	96.5
LBW	1.2	2.4	98.8

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	77.2	%	65-95
	#16 (1.18mm)	60.8	%	35-75
	#30 (.6mm)	45.2	%	20-55
	#50 (.3mm)	25.0	%	10-30
	#100 (.15mm)	6.3	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.88		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	4.73	%	



Plant S39-Superior Sterling Heights

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/02/2021 - 05/08/2021

Report Date 05/08/2021

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)	78.1	%	
	3/8" (9.5mm)	57.0	%	
	#4 (4.75mm)	13.2	%	
	#8 (2.36mm)	4.9	%	
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	3.07	%	



Plant S39-Superior Sterling Heights

Product 7919-COARSE AGG P1M LS

Period: 05/02/2021 - 05/08/2021

Name/Title Doug Storey / QC Technician

Report Date 05/08/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	72.4	%	
	3/4" (19mm)	24.8	%	
	1/2" (12.5mm)	5.4	%	
	3/8" (9.5mm)	3.5	%	
	#4 (4.75mm)	2.5	%	
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	0.29	%	