

Aggregate Optimization Chart

PLANT #: **P11**

Sample Date: 5/13/24

Dates Test Represents: 5/14/2024 through 5/20/2024

Concrete Grade: **P1M, 3500HP**

Contractor: _____

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	970	5.93	2.62	31.6
NNS	95-013	Smelter Isle	1200	7.26	2.65	39.1
Total Wt						18,70
						100.0

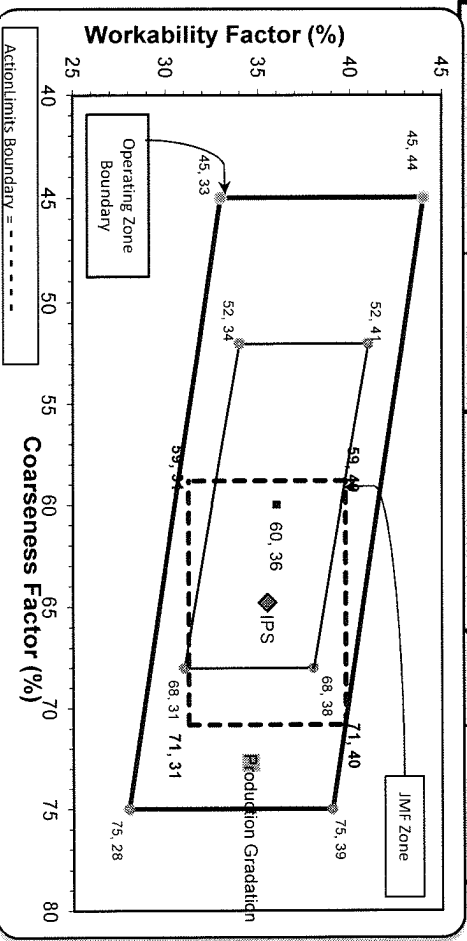
Verify this number is 100%

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	92.6	100.0	100.0	97.8	2.2	2.2
1"	28.4	100.0	100.0	79.0	18.8	21.0
3/4"	9.0	98.3	100.0	72.8	6.2	27.2
1/2"	2.7	68.3	100.0	61.5	11.3	38.5
3/8"	2.1	40.3	100.0	52.4	9.0	47.6
#4	1.9	6.2	96.3	40.2	12.3	59.8
#8	1.8	2.6	85.0	34.6	5.6	65.4
#16	1.7	2.0	70.4	28.6	5.9	71.4
#30	1.6	1.9	50.5	20.8	7.8	79.2
#50	1.5	1.8	23.6	10.2	10.6	89.8
#100	1.3	1.7	6.9	3.6	6.6	96.4
LBW	1.1	1.5	1.3	1.3	2.3	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: **73** Workability Factor: **35**



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



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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S11-Onsite Jefferson

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	92.6	%	
	1" (25mm)	28.4	%	
	3/4" (19mm)	9.0	%	
	1/2" (12.5mm)	2.7	%	
	3/8" (9.5mm)	2.1	%	
	#4 (4.75mm)	1.9	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	1.34	%	



Plant S11-Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

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)	98.3	%	
	1/2" (12.5mm)	68.3	%	
	3/8" (9.5mm)	40.3	%	
	#4 (4.75mm)	6.2	%	
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	2.03	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Period: 05/12/2024 - 05/18/2024

Name/Title Doug Storey / QC Technician

Report Date 05/18/2024

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)	85.0	%	65-95
	#16 (1.18mm)	70.4	%	35-75
	#30 (.6mm)	50.5	%	20-55
	#50 (.3mm)	23.6	%	10-30
	#100 (.15mm)	6.9	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	4.66	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

Sample Date: 5/13/24

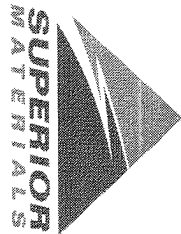
Dates Test Represents: 5/14/2024

through 5/20/2024

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



Superior Materials, LLC
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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	
NNS	44-051	Krake Willis Rd	1250	7.56	2.65	40.7	
Total Wt						3070	100.0

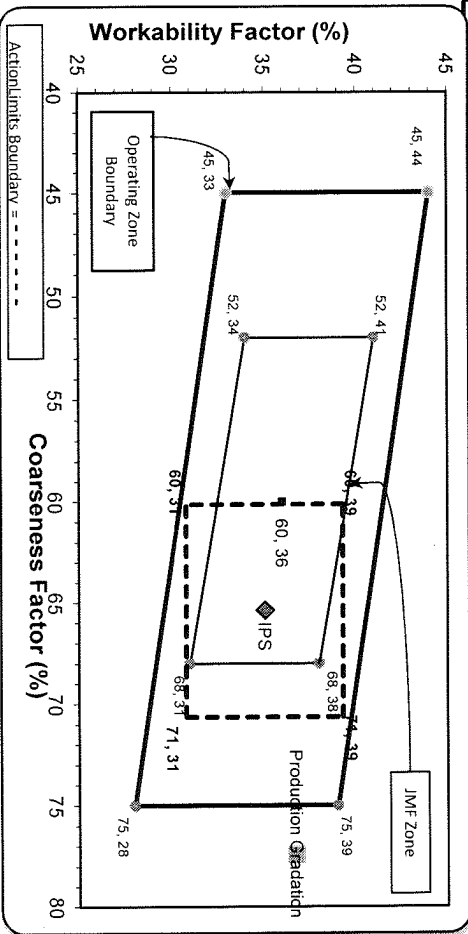
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.7	100.0	100.0	98.9	1.1	1.1
1"	30.7	100.0	100.0	77.0	21.9	23.0
3/4"	7.2	98.6	100.0	68.8	8.2	31.2
1/2"	2.9	66.5	100.0	59.0	9.8	41.0
3/8"	2.6	36.2	100.0	51.0	8.0	49.0
#4	2.4	5.9	99.0	42.6	8.4	57.4
#8	2.3	3.5	86.1	36.7	5.9	63.3
#16	2.3	2.9	71.2	30.5	6.2	69.5
#30	2.2	2.6	52.1	22.6	7.9	77.4
#50	2.0	2.4	25.6	11.7	10.9	88.3
#100	1.8	2.2	5.9	3.6	8.1	96.4
LBW	1.5	1.9	1.1	1.4	2.1	98.6

*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: **77** Workability Factor: **37**



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 7919-COARSE AGG P1M LS
Period: 05/12/2024 - 05/18/2024

Name/Title Doug Storey / QC Technician
Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.7	%	
	1" (25mm)	30.7	%	
	3/4" (19mm)	7.2	%	
	1/2" (12.5mm)	2.9	%	
	3/8" (9.5mm)	2.6	%	
	#4 (4.75mm)	2.4	%	
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75µm)	1.5	%	0-2
	Total Moisture	0.99	%	



Plant S39-Superior Sterling Heights
 Product 7920-INTERMED AGG P1M LS
 Period: 05/12/2024 - 05/18/2024

Name/Title Doug Storey / QC Technician
 Report Date 05/18/2024

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)	98.6	%	
	1/2" (12.5mm)	66.5	%	
	3/8" (9.5mm)	36.2	%	
	#4 (4.75mm)	5.9	%	
	#8 (2.36mm)	3.5	%	
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75µm)	1.9	%	0-3
	Total Moisture	1.53	%	



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

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)	86.1	%	65-95
	#16 (1.18mm)	71.2	%	35-75
	#30 (.6mm)	52.1	%	20-55
	#50 (.3mm)	25.6	%	10-30
	#100 (.15mm)	5.9	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.60		2.6-3
	Wash Loss (#200/75µm)	1.1	%	0-3
	Total Moisture	3.63	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

Sample Date: **5/13/24**

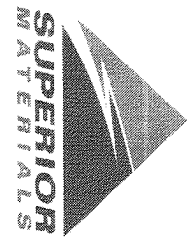
Dates Test Represents: **5/14/2024**

through **5/20/2024**

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



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

Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	58-003	Stonoco	1470	8.76	2.69	47.1
IA	58-003	Stonoco	450	2.68	2.69	14.4
NNS	63-114	Highland	1200	7.26	2.65	38.5
Total Wt						18.70
						100.0

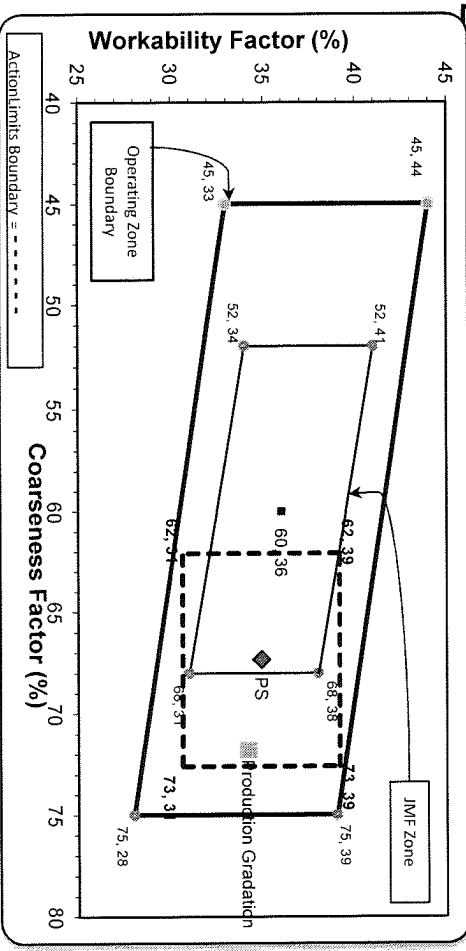
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	72.9	100.0	100.0	87.2	12.8	12.8
3/4"	42.9	100.0	100.0	73.1	14.1	26.9
1/2"	16.1	92.4	100.0	59.4	13.7	40.6
3/8"	6.9	76.6	100.0	52.8	6.6	47.2
#4	1.7	16.7	98.9	41.2	11.5	58.8
#8	1.3	4.5	85.6	34.2	7.1	65.8
#16	1.1	3.0	67.1	26.8	7.4	73.2
#30	1.1	2.6	47.9	19.3	7.4	80.7
#50	1.1	2.3	20.3	8.7	10.7	91.3
#100	1.0	2.2	4.2	2.4	6.3	97.6
LBW	0.9	2.1	0.9	1.1	1.3	98.9

<----- Verify this number is 100%

*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: **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"			85.5	14.5	14.5
3/4"			73.4	12.1	26.6
1/2"			61.0	12.4	39.0
3/8"			56.2	4.8	43.8
#4			43.1	13.1	56.9
#8			34.9	8.2	65.1
#16			29.4	5.5	70.6
#30			21.6	7.8	78.4
#50			8.1	13.4	91.9
#100			2.2	5.9	97.8
LBW			1.4	0.8	98.6

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	72.9	%	
	3/4" (19mm)	42.9	%	
	1/2" (12.5mm)	16.1	%	
	3/8" (9.5mm)	6.9	%	
	#4 (4.75mm)	1.7	%	
	#8 (2.36mm)	1.3	%	
	#16 (1.18mm)	1.1	%	
	#30 (.6mm)	1.1	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	1.0	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	1.96	%	



Plant S102-Superior Novi
 Product 7920-INTERMED AGG P1M LS
 Period: 05/12/2024 - 05/18/2024

Name/Title Doug Storey / QC Technician
 Report Date 05/18/2024

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)	92.4	%	
	3/8" (9.5mm)	76.6	%	
	#4 (4.75mm)	16.7	%	
	#8 (2.36mm)	4.5	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	3.43	%	



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/12/2024 - 05/18/2024

Report Date 05/18/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.9	%	95-100
	#8 (2.36mm)	85.6	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	47.9	%	20-55
	#50 (.3mm)	20.3	%	10-30
	#100 (.15mm)	4.2	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.64	%	