

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-38**

Sample Date: 4/17/23

Dates Test Represents: 4/18/2023 through 4/24/2023

Concrete Grade: **DM, 4500HP**

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 %
6AA	58-003	Stoneco	1550	9.23	2.69	52.5
26A	58-003	Stoneco	250	1.49	2.69	8.5
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
			Total Wt	2950	17.68	100.0

Sieve	6AA	26A	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"	98.4	100.0	100.0	99.2	0.8	0.8
3/4"	81.7	100.0	100.0	90.4	8.8	9.6
1/2"	44.3	99.5	100.0	70.7	19.7	29.3
3/8"	24.1	88.9	100.0	59.2	11.5	40.8
#4	3.6	13.6	97.2	40.9	18.2	59.1
#8	1.7	4.7	82.3	33.4	7.6	66.6
#16	1.4	3.2	65.1	26.4	7.0	73.6
#30	1.3	2.7	46.5	19.0	7.3	81.0
#50	1.2	2.4	21.5	9.2	9.8	90.8
#100	1.2	2.2	6.0	3.2	6.1	96.8
LBW	1.0	2.0	1.1	1.1	2.0	98.9

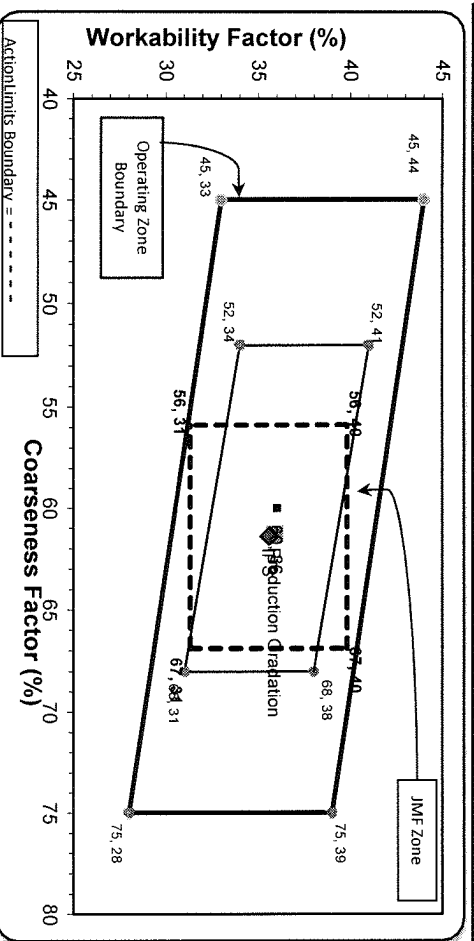
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **61** Workability Factor: **33** Adjusted WF: **35.9**

Initial Production Sample (IPS)

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



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S38-Superior Ann Arbor

Product 1051-6AA LS

Period: 04/16/2023 - 04/22/2023

Name/Title Doug Storey / QC Technician

Report Date 04/22/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.4	%	95-100
	3/4" (19mm)	81.7	%	
	1/2" (12.5mm)	44.3	%	30-60
	3/8" (9.5mm)	24.1	%	
	#4 (4.75mm)	3.6	%	0-8
	#8 (2.36mm)	1.7	%	
	#16 (1.18mm)	1.4	%	
	#30 (.6mm)	1.3	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.09	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.82	%	



Plant S38-Superior Ann Arbor

Product 1067-26A Mod LS

Period: 04/16/2023 - 04/22/2023

Name/Title Doug Storey / QC Technician

Report Date 04/22/2023

Procedure	Sieve/Test	Result	Unit	26A Mod LS Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	100.0	%	100-100
	1/2" (12.5mm)	99.5	%	95-100
	3/8" (9.5mm)	88.9	%	60-95
	#4 (4.75mm)	13.6	%	5-30
	#8 (2.36mm)	4.7	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.23	%	



Plant S38-Superior Ann Arbor

Product 1022-2NS GR

Period: 04/16/2023 - 04/22/2023

Name/Title Doug Storey / QC Technician

Report Date 04/22/2023

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)	82.3	%	65-95
	#16 (1.18mm)	65.1	%	35-75
	#30 (.6mm)	46.5	%	20-55
	#50 (.3mm)	21.5	%	10-30
	#100 (.15mm)	6.0	%	0-10
	#200 (75µm)	1.5	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	2.80	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-101**

Contractor: _____

Sample Date: **4/17/23**

Dates Test Represents: **4/18/2023** through **4/24/2023**

Concrete Grade: **DM, 4500HP**

MDOT No.: _____

Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1400	8.56	2.62	48.3
26A	71-47	Presque Isle	350	2.14	2.62	12.1
2NS	75-051	Mid Michigan	1150	6.93	2.66	39.7
Total Wt			2900			100.0

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

Sieve	6AA	26A	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"	98.4	100.0	100.0	99.2	0.8	0.8
3/4"	81.0	100.0	100.0	90.8	8.4	9.2
1/2"	41.2	96.5	100.0	71.2	19.6	28.8
3/8"	23.0	88.4	100.0	61.4	9.8	38.6
#4	3.6	21.8	97.6	43.1	18.4	56.9
#8	1.9	4.9	84.1	34.9	8.2	65.1
#16	1.7	2.9	69.2	28.6	6.2	71.4
#30	1.7	2.4	53.7	22.4	6.2	77.6
#50	1.6	2.3	28.0	12.2	10.3	87.8
#100	1.5	2.2	8.2	4.2	7.9	95.8
LBW	1.2	1.9	0.9	1.2	3.1	98.8

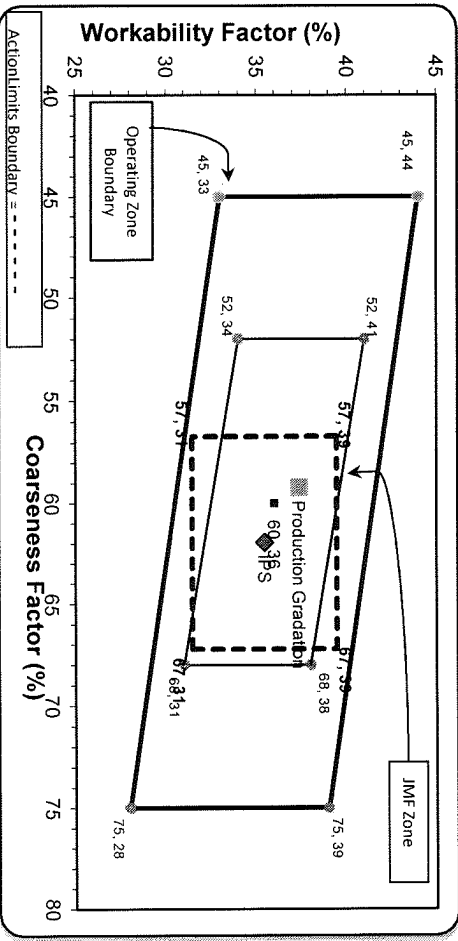
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

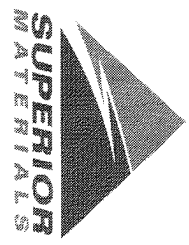
Coarseness Factor: **59** Workability Factor: **35** Adjusted WF: **37.4**

Initial Production Sample (IPS)

Coarseness Factor: **62** Workability Factor: **35**



Sieve	% Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.0	5.0	5.0
1/2"	70.5	24.5	29.5
3/8"	60.0	10.5	40.0
#4	44.4	15.6	55.6
#8	35.5	9.0	64.5
#16	28.5	7.0	71.5
#30	21.5	7.0	78.5
#50	10.2	11.3	89.8
#100	3.1	7.1	96.9
LBW	1.3	1.8	98.7



Superior Materials, LLC
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 Suite 500
 Farmington Hills, MI 48336

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S101-Superior Mount Clemens

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 04/16/2023 - 04/22/2023

Report Date 04/22/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.4	%	95-100
	3/4" (19mm)	81.0	%	
	1/2" (12.5mm)	41.2	%	30-60
	3/8" (9.5mm)	23.0	%	
	#4 (4.75mm)	3.6	%	0-8
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.37	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	3.38	%	



Plant S101-Superior Mount Clemens

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/16/2023 - 04/22/2023

Report Date 04/22/2023

Procedure	Sieve/Test	Result	Unit	26A Mod LS Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	100.0	%	100-100
	1/2" (12.5mm)	96.5	%	95-100
	3/8" (9.5mm)	88.4	%	60-95
	#4 (4.75mm)	21.8	%	5-30
	#8 (2.36mm)	4.9	%	0-12
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	4.48	%	



Plant S101-Superior Mount Clemens

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/16/2023 - 04/22/2023

Report Date 04/22/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.6	%	95-100
	#8 (2.36mm)	84.1	%	65-95
	#16 (1.18mm)	69.2	%	35-75
	#30 (.6mm)	53.7	%	20-55
	#50 (.3mm)	28.0	%	10-30
	#100 (.15mm)	8.2	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.59		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	5.13	%	