

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **14**

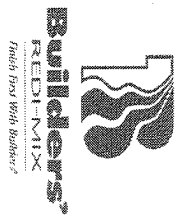
Sample Date: **10/2/23**

Dates Test Represents: **10/3/2023** through **10/9/2023**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



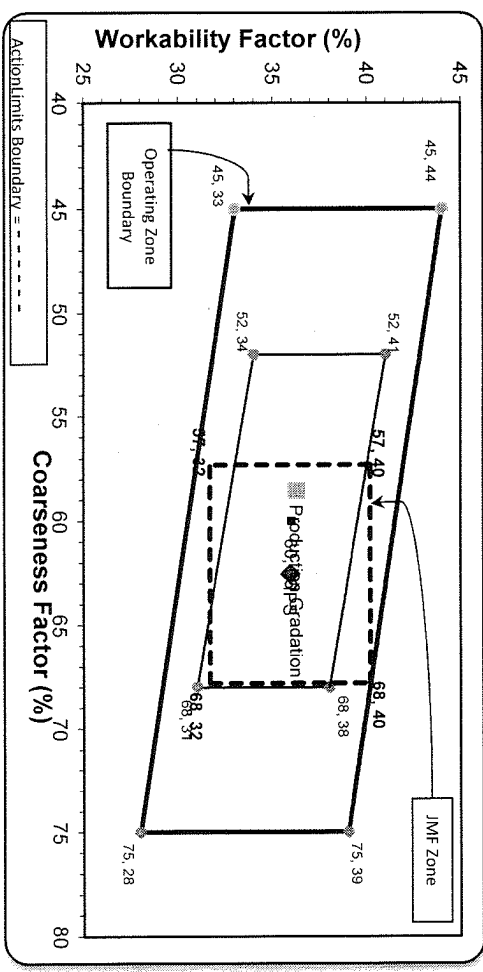
Builders Redi-Mix
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %	
6AA	58-003	Stoneco	1400	8.34	2.69	47.3	
26A	58-003	Stoneco	460	2.74	2.69	15.5	
2NS	19-04	Schlegel	1100	6.60	2.67	37.2	
Total Wt						2960	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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	88.1	100.0	100.0	94.4	5.6	5.6
1/2"	49.1	100.0	100.0	75.9	18.4	24.1
3/8"	21.7	88.9	100.0	61.2	14.7	38.8
#4	2.4	8.9	99.7	39.6	21.7	60.4
#8	1.5	3.3	87.6	33.8	5.8	66.2
#16	1.3	2.6	70.3	27.1	6.6	72.9
#30	1.2	2.4	51.6	20.1	7.0	79.9
#50	1.2	2.3	18.0	7.6	12.5	92.4
#100	1.1	2.2	3.5	2.2	5.5	97.8
LBW	0.9	2.1	0.9	1.1	1.1	98.9

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **59** Workability Factor: **34** Adjusted WF: **36.3**



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"	89.0	10.3	11.0
1/2"	70.3	18.7	29.7
3/8"	59.9	10.4	40.1
#4	41.9	18.0	58.1
#8	35.9	6.0	64.1
#16	27.8	8.2	72.2
#30	18.9	8.8	81.1
#50	6.3	12.6	93.7
#100	1.7	4.6	98.3
LBW	1.0	0.7	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S14-Superior Lansing

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 10/01/2023 - 10/07/2023

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	100.0	%	95-100
	3/4" (19mm)	88.1	%	
	1/2" (12.5mm)	49.1	%	30-60
	3/8" (9.5mm)	21.7	%	
	#4 (4.75mm)	2.4	%	0-8
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	1.03	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	3.49	%	



Plant S14-Superior Lansing

Product 1067-26A Mod LS

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	26A 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)	100.0	%	95-100
	3/8" (9.5mm)	88.9	%	60-95
	#4 (4.75mm)	8.9	%	5-30
	#8 (2.36mm)	3.3	%	0-12
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	3.82	%	



Plant S14-Superior Lansing

Product 1022-2NS GR

Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.7	%	95-100
	#8 (2.36mm)	87.6	%	65-95
	#16 (1.18mm)	70.3	%	35-75
	#30 (.6mm)	51.6	%	20-55
	#50 (.3mm)	18.0	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.32	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

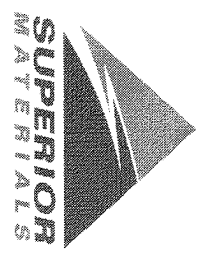
Sample Date: **10/2/23**

Dates Test Represents: **10/3/2023** through **10/9/2023**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



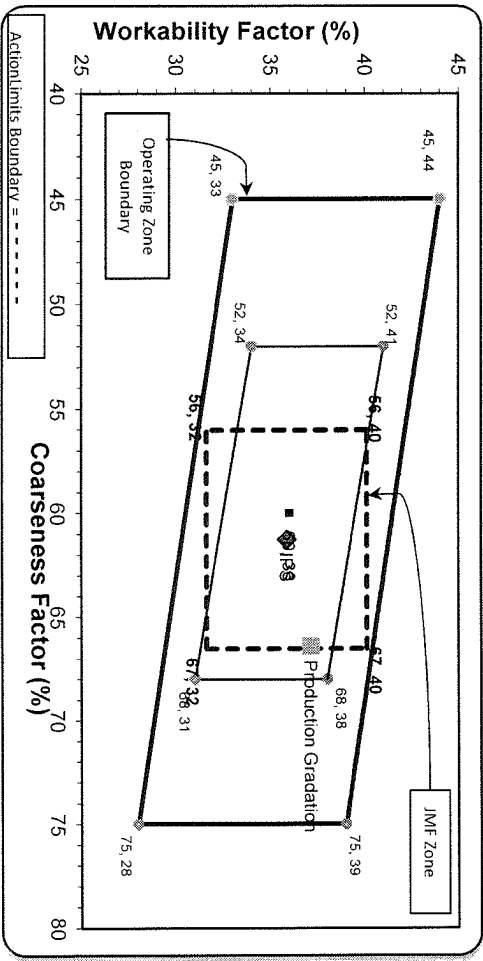
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
ZNS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

Sieve	6AA	26A	ZNS	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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	77.2	100.0	100.0	89.2	10.8	10.8
1/2"	30.7	99.7	100.0	67.1	22.1	32.9
3/8"	11.4	90.0	100.0	56.6	10.5	43.4
#4	2.4	13.4	98.5	41.4	15.2	58.6
#8	1.8	4.5	85.1	34.6	6.7	65.4
#16	1.6	3.2	65.7	26.8	7.8	73.2
#30	1.5	2.8	46.2	19.1	7.7	80.9
#50	1.4	2.6	21.5	9.4	9.7	90.6
#100	1.3	2.4	4.8	2.8	6.6	97.2
LBW	1.0	2.2	1.3	1.3	1.5	98.7

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	35	Adjusted WF:	37.1
Coarseness Factor:		Workability Factor:		Initial Production Sample (IPS):	
Coarseness Factor:		Workability Factor:		Coarseness Factor:	61
Coarseness Factor:		Workability Factor:		Coarseness 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"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	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 4% for the 3/4" sieve when
 a 1.5" max. size (nom. Max. 1.0") aggregate is used.

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 10/01/2023 - 10/07/2023

Report Date 10/07/2023

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)	99.7	%	95-100
	3/8" (9.5mm)	90.0	%	60-95
	#4 (4.75mm)	13.4	%	5-30
	#8 (2.36mm)	4.5	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	2.66	%	



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/01/2023 - 10/07/2023

Report Date 10/07/2023

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)	85.1	%	65-95
	#16 (1.18mm)	65.7	%	35-75
	#30 (.6mm)	46.2	%	20-55
	#50 (.3mm)	21.5	%	10-30
	#100 (.15mm)	4.8	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.31	%	



Plant S102-Superior Novi
Product 1022-2NS GR
Period: 10/01/2023 - 10/07/2023

Name/Title Doug Storey / QC Technician
Report Date 10/07/2023

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)	85.1	%	65-95
	#16 (1.18mm)	65.7	%	35-75
	#30 (.6mm)	46.2	%	20-55
	#50 (.3mm)	21.5	%	10-30
	#100 (.15mm)	4.8	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.31	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-103

Sample Date: 10/2/23

Dates Test Represents: 10/3/2023 through 10/9/2023

Concrete Grade: DM, 4500HP

Contractor: _____

MDOT No.: _____



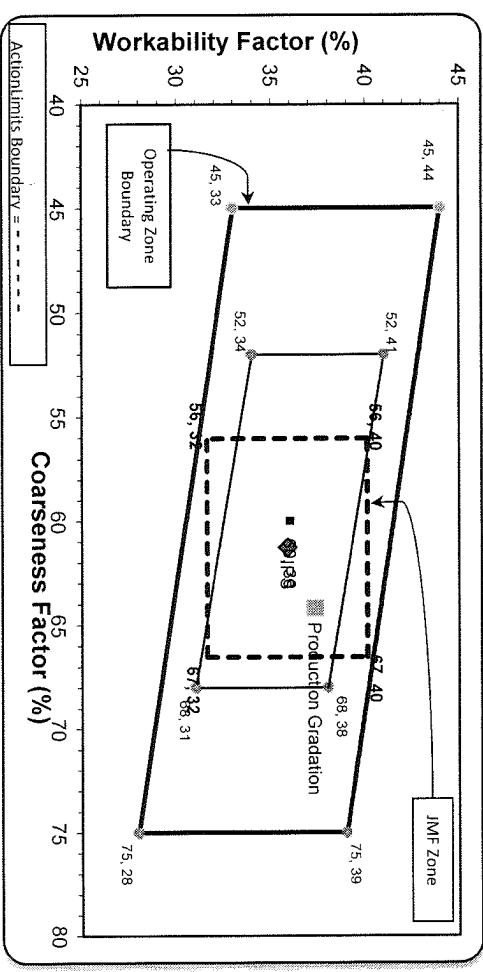
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Aggr. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	74.8	100.0	100.0	99.2	11.7	12.0
1/2"	33.9	99.2	100.0	88.2	19.5	31.5
3/8"	15.2	88.2	100.0	73.0	27.0	41.8
#4	2.1	9.2	99.0	66.0	34.0	59.2
#8	1.6	2.8	86.4	64.8	35.2	65.2
#16	1.5	2.2	66.9	63.4	36.6	72.9
#30	1.3	2.1	47.6	62.1	37.9	80.5
#50	1.2	2.0	21.3	60.1	39.9	90.9
#100	1.1	1.9	3.7	58.2	41.8	97.8
LBW	0.8	1.7	0.6	58.2	41.8	99.2

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **64** Workability Factor: **35** Adjusted WF: **37.3**



Sieve	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	61	36	37.3
1.5"	61	36	37.3
1"	61	36	37.3
3/4"	61	36	37.3
1/2"	61	36	37.3
3/8"	61	36	37.3
#4	61	36	37.3
#8	61	36	37.3
#16	61	36	37.3
#30	61	36	37.3
#50	61	36	37.3
#100	61	36	37.3
LBW	61	36	37.3

*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

PREPARED BY:
SM, LLC Technical Service

Approved BY: _____



Plant S103-Superior Brighton

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 10/01/2023 - 10/07/2023

Report Date 10/07/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.4	%	95-100
	3/4" (19mm)	74.8	%	
	1/2" (12.5mm)	33.9	%	30-60
	3/8" (9.5mm)	15.2	%	
	#4 (4.75mm)	2.1	%	0-8
	#8 (2.36mm)	1.6	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.3	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	0.92	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	1.61	%	



Plant S103-Superior Brighton

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 10/01/2023 - 10/07/2023

Report Date 10/07/2023

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)	99.2	%	95-100
	3/8" (9.5mm)	88.2	%	60-95
	#4 (4.75mm)	9.2	%	5-30
	#8 (2.36mm)	2.8	%	0-12
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75µm)	1.7	%	0-3
	Total Moisture	2.98	%	



Plant S103-Superior Brighton

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/01/2023 - 10/07/2023

Report Date 10/07/2023

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)	86.4	%	65-95
	#16 (1.18mm)	66.9	%	35-75
	#30 (.6mm)	47.6	%	20-55
	#50 (.3mm)	21.3	%	10-30
	#100 (.15mm)	3.7	%	0-10
	#200 (75µm)	0.8	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	2.95	%	