

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **6/22/20**

Dates Test Represents: **6/23/2020** through **6/29/2020**

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1820	11.13	2.62	59.7
26A	71-47	Presque Isle	0	0.00	2.62	0.0
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt:			3050	18.57		100.0

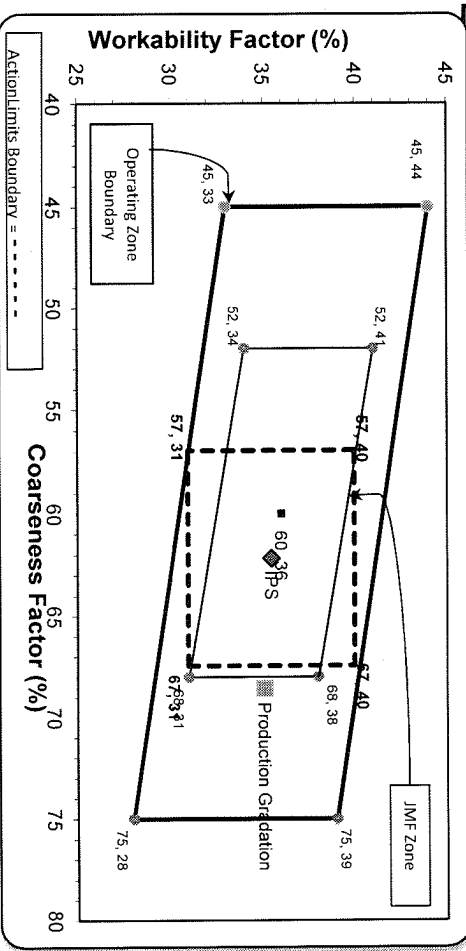
<----- Verify this number is 100%

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"	98.7	100.0	100.0	99.2	0.8	0.8
3/4"	78.8	100.0	100.0	87.3	11.9	12.7
1/2"	42.3	96.2	100.0	65.6	21.8	34.4
3/8"	25.4	87.3	100.0	55.5	10.1	44.5
#4	6.7	28.5	96.3	42.8	12.7	57.2
#8	3.3	9.0	82.1	35.1	7.8	64.9
#16	2.7	4.4	66.0	28.2	6.9	71.8
#30	2.5	3.4	46.5	20.2	8.0	79.8
#50	2.3	2.9	21.5	10.0	10.2	90.0
#100	2.1	2.6	5.7	3.6	6.5	96.4
LBW	1.8	2.1	1.5	1.7	1.9	98.3

*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 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

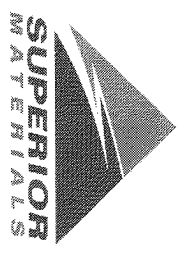
Coarseness Factor: **69** Workability Factor: **35**



Initial Production Sample (IPS)

Coarseness Factor: **62** 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"	100.0	0.0	0.0
3/4"	94.0	6.0	6.0
1/2"	70.2	23.7	29.8
3/8"	59.9	10.4	40.1
#4	42.7	17.2	57.3
#8	35.5	7.2	64.5
#16	28.4	7.0	71.6
#30	19.2	9.2	80.8
#50	8.9	10.3	91.1
#100	3.1	5.9	96.9
LBW	1.4	1.7	98.6



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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.7	%	95-100
	3/4" (19mm)	78.8	%	
	1/2" (12.5mm)	42.3	%	30-60
	3/8" (9.5mm)	25.4	%	
	#4 (4.75mm)	6.7	%	0-8
	#8 (2.36mm)	3.3	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	3.2	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

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)	96.2	%	95-100
	3/8" (9.5mm)	87.3	%	60-95
	#4 (4.75mm)	28.5	%	5-30
	#8 (2.36mm)	9.0	%	0-12
	#16 (1.18mm)	4.4	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	4.2	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

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)	82.1	%	65-95
	#16 (1.18mm)	66.0	%	35-75
	#30 (.6mm)	46.5	%	20-55
	#50 (.3mm)	21.5	%	10-30
	#100 (.15mm)	5.7	%	0-10
	#200 (75µm)	1.5	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	5.6	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

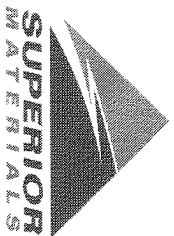
Sample Date: 6/22/20

Dates Test Represents: 6/23/2020 through 6/29/2020

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____



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

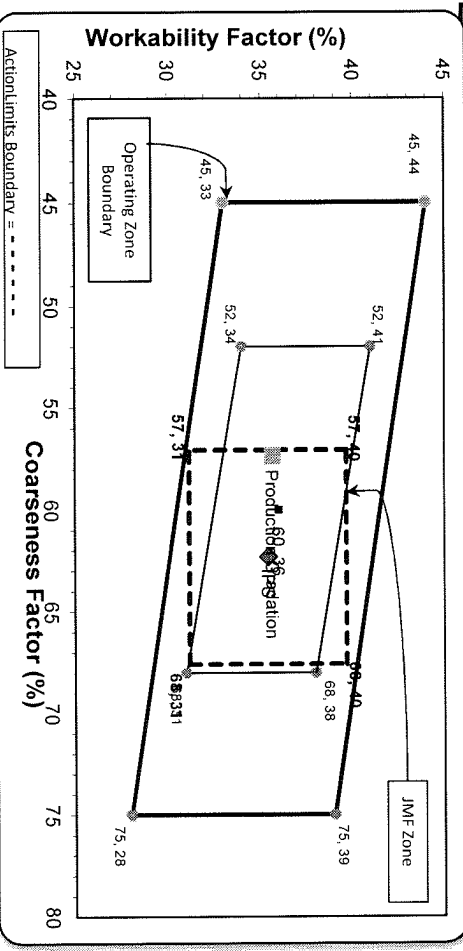
Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1550	9.48	2.62	50.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
			Total Wt	3050	18.57	100.0

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"	84.0	100.0	100.0	91.9	8.1	8.1
1/2"	52.0	96.6	100.0	75.3	16.6	24.7
3/8"	30.6	83.4	100.0	63.1	12.2	36.9
#4	6.5	29.1	97.4	44.5	18.6	55.5
#8	2.9	9.2	84.6	35.7	8.8	64.3
#16	2.3	4.0	70.0	29.1	6.6	70.9
#30	2.2	2.9	50.0	21.1	8.0	78.9
#50	2.0	2.5	20.1	9.2	11.9	90.8
#100	1.8	2.0	3.0	2.3	6.9	97.7
LBW	1.6	1.5	0.5	1.2	1.1	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: **57** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	% Cumulative Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.1	0.9	0.9
3/4"	90.5	8.6	9.5
1/2"	69.8	20.7	30.2
3/8"	59.8	10.0	40.2
#4	42.2	17.6	57.8
#8	35.4	6.7	64.6
#16	28.8	6.7	71.2
#30	21.4	7.4	78.6
#50	8.8	12.6	91.2
#100	1.8	7.0	98.2
LBW	0.7	1.0	99.3

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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

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)	84.0	%	
	1/2" (12.5mm)	52.0	%	30-60
	3/8" (9.5mm)	30.6	%	
	#4 (4.75mm)	6.5	%	0-8
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.62	%	



Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

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)	96.6	%	95-100
	3/8" (9.5mm)	83.4	%	60-95
	#4 (4.75mm)	29.1	%	5-30
	#8 (2.36mm)	9.2	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	2.88	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.4	%	95-100
	#8 (2.36mm)	84.6	%	65-95
	#16 (1.18mm)	70.0	%	35-75
	#30 (.6mm)	50.0	%	20-55
	#50 (.3mm)	20.1	%	10-30
	#100 (.15mm)	3.0	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.35	%	

Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: **6/22/20**

Dates Test Represents: **6/23/2020** through **6/29/2020**

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____



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

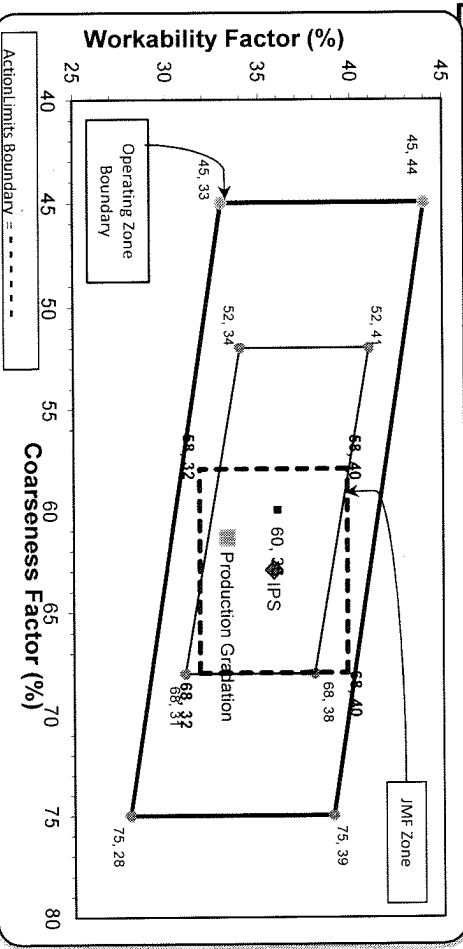
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1700	10.40	2.62	55.7
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	44-051	Krake Willis Rd	1200	7.26	2.65	39.3
Total Wt			3050	18.57		100.0

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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	87.7	100.0	100.0	93.1	6.6	6.9
1/2"	52.1	96.2	100.0	73.1	20.0	26.9
3/8"	28.2	81.3	100.0	59.1	41.1	40.9
#4	5.8	19.5	95.7	41.8	58.2	58.2
#8	3.0	5.9	79.6	33.3	66.7	72.2
#16	2.5	3.2	66.6	27.8	72.2	80.1
#30	2.3	2.7	47.1	19.9	80.1	88.7
#50	2.2	2.5	25.2	11.3	88.7	95.8
#100	2.1	2.4	7.4	4.2	95.8	98.1
LBW	1.8	2.2	2.0	1.9	98.1	98.1

*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

Coarseness Factor: **61** Workability Factor: **33**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	63	36	0.0	0.0
1.5"			0.0	0.0
1"			0.0	0.0
3/4"			10.2	10.2
1/2"			19.1	29.3
3/8"			11.1	40.4
#4			16.4	56.8
#8			7.4	64.2
#16			6.6	70.8
#30			7.8	78.6
#50			11.6	90.2
#100			6.1	96.3
LBW			2.5	98.8

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.5	%	95-100
	3/4" (19mm)	87.7	%	
	1/2" (12.5mm)	52.1	%	30-60
	3/8" (9.5mm)	28.2	%	
	#4 (4.75mm)	5.8	%	0-8
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.82	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	4.14	%	



Plant S39-Superior Sterling Heights

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 06/21/2020 - 06/27/2020

Report Date 06/27/2020

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)	96.2	%	95-100
	3/8" (9.5mm)	81.3	%	60-95
	#4 (4.75mm)	19.5	%	5-30
	#8 (2.36mm)	5.9	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	3.58	%	



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Period: 06/21/2020 - 06/27/2020

Name/Title Doug Storey / QC Technician

Report Date 06/27/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	79.6	%	65-95
	#16 (1.18mm)	66.6	%	35-75
	#30 (.6mm)	47.1	%	20-55
	#50 (.3mm)	25.2	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	4.45	%	