Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

Contractor: _____

Sample Date: 6/3/19

Concrete Grade: **S2M**

Dates Test Represents: 6/4/2019 through 6/10/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1600	9.79	2.62	52.5
26A	71-47	Presque Isle	200	1.22	2.62	6.6
2NS	63-92	Grange Hall	1250	7.56	2.65	41.0
		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"	97.2	100.0	100.0	98.5	1.5	1.5
3/4"	84.2	100.0	100.0	91.7	6.8	8.3
1/2"	51.0	97.3	100.0	74.1	17.6	25.9
3/8"	32.9	88.6	100.0	64.1	10.1	35.9
#4	5.9	23.2	97.3	44.5	19.6	55.5
#8	2.5	6.2	84.6	36.4	8.1	63.6
#16	2.0	3.9	69.0	29.6	6.8	70.4
#30	1.9	2.9	51.2	22.2	7.4	77.8
#50	1.8	2.6	23.5	10.7	11.4	89.3
#100	1.7	2.4	4.0	2.7	8.1	97.3
LBW	1.6	2.2	0.3	1.1	1.6	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.

Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
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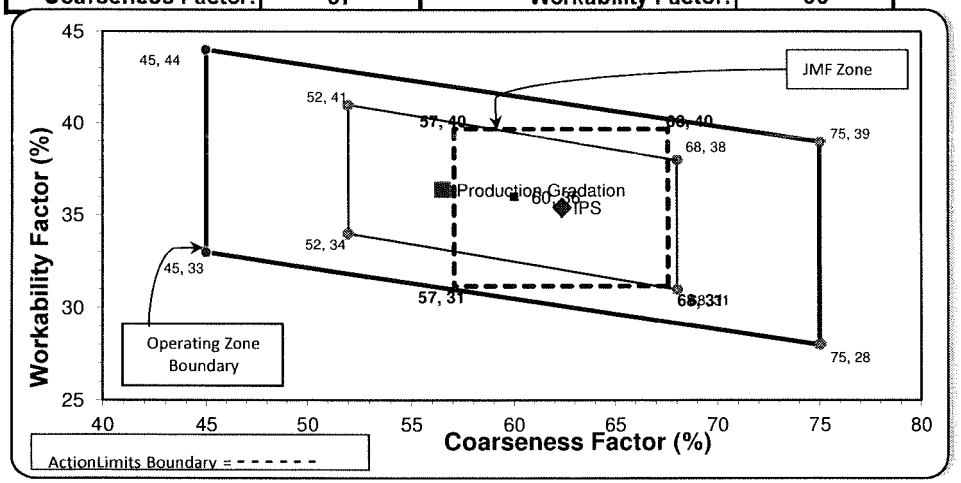
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	57	Workability Factor:	36



Intial 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"	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

PREPARED BY:
SM, LLC Technical Service

Approved By:

Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Period: 06/02/2019 - 06/08/2019

Name/Title Doug Storey / QC Technician

Report Date 06/06/2019

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.2	%	95-100
	3/4" (19mm)	84.2	%	
	1/2" (12.5mm)	51.0	%	30-60
	3/8" (9.5mm)	32.9	%	
	#4 (4.75mm)	5.9	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.0	%	
	#30 (0.6mm)	1.9	%	
	#50 (0.3mm)	1.8	%	
	#100 (0.15mm)	1.7	%	
	#200 (75µm)	1.62	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.46	%	

Superior Auburn Hills
2470 Auburn Road
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Plant S36-Superior Auburn Hills

Product 1067-26A LS

Name/Title Doug Storey / QC Technician

Period: 06/02/2019 - 06/08/2019

Report Date 06/06/2019

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)	97.3	%	95-100
	3/8" (9.5mm)	88.6	%	60-90
	#4 (4.75mm)	23.2	%	5-30
	#8 (2.36mm)	6.2	%	0-12
	#16 (1.18mm)	3.9	%	
	#30 (0.6mm)	2.9	%	
	#50 (0.3mm)	2.6	%	
	#100 (0.15mm)	2.4	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	2.68	%	

Superior Auburn Hills
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Plant S36-Superior Auburn Hills

Product 1022-2NS GR **Name/Title** Doug Storey / QC Technician

Period: 06/02/2019 - 06/08/2019 **Report Date** 06/06/2019

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.3	%	95-100
	#8 (2.36mm)	84.6	%	65-95
	#16 (1.18mm)	69.0	%	35-75
	#30 (0.6mm)	51.2	%	20-55
	#50 (0.3mm)	23.5	%	10-30
	#100 (0.15mm)	4.0	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	0.3	%	0-3
	Total Moisture	3.52	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

Contractor: _____

Sample Date: 6/3/19

Concrete Grade: **S2M**

Dates Test Represents: 6/4/2019 through 6/10/2019

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1680	10.28	2.62	55.1
26A	71-47	Presque Isle	100	0.61	2.62	3.3
2NS	44-051	Krake Willis Rd	1270	7.68	2.65	41.6
		Total Wt	**3050**	**18.57**		100.0

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

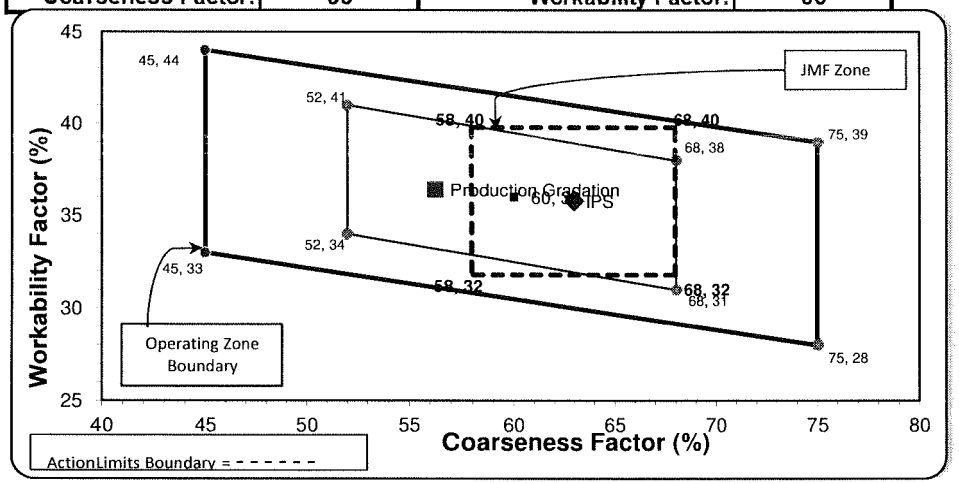
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

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	98.9	100.0	99.7	0.3	0.3
3/4"	87.6	98.9	100.0	93.1	6.6	6.9
1/2"	50.8	98.0	100.0	72.8	20.3	27.2
3/8"	35.5	92.3	100.0	64.2	8.6	35.8
#4	7.3	27.7	96.1	44.9	19.3	55.1
#8	3.0	9.9	82.7	36.4	8.5	63.6
#16	2.5	5.4	69.7	30.6	5.8	69.4
#30	2.4	4.2	53.4	23.7	6.9	76.3
#50	2.3	3.8	24.7	11.7	12.0	88.3
#100	2.2	3.5	8.5	4.9	6.8	95.1
LBW	1.7	3.0	2.0	1.9	3.0	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:	56	Workability Factor:	36



Intial Production Sample (IPS)

Coarseness Factor:	63
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"	100.0	0.0	0.0
3/4"	89.8	10.2	10.2
1/2"	70.7	19.1	29.3
3/8"	59.6	11.1	40.4
#4	43.2	16.4	56.8
#8	35.8	7.4	64.2
#16	29.2	6.6	70.8
#30	21.4	7.8	78.6
#50	9.8	11.6	90.2
#100	3.7	6.1	96.3
LBW	1.2	2.5	98.8

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S39-Superior Sterling Heights

Product 1051-6AA LS

Period: 06/02/2019 - 06/08/2019

Name/Title Doug Storey / QC Technician

Report Date 06/05/2019

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)	87.6	%	
	1/2" (12.5mm)	50.8	%	30-60
	3/8" (9.5mm)	35.5	%	
	#4 (4.75mm)	7.3	%	0-8
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.5	%	
	#30 (0.6mm)	2.4	%	
	#50 (0.3mm)	2.3	%	
	#100 (0.15mm)	2.2	%	
	#200 (75µm)	2.06	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	2.85	%	

Plant S39-Superior Sterling Heights

Product 1067-26A LS

Name/Title Doug Storey / QC Technician

Period: 06/02/2019 - 06/08/2019

Report Date 06/06/2019

Procedure	Sieve/Test	Result	Unit	26A LS Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	99.4	%	
	3/4" (19mm)	99.4	%	100-100
	1/2" (12.5mm)	98.2	%	95-100
	3/8" (9.5mm)	92.0	%	60-90
	#4 (4.75mm)	24.6	%	5-30
	#8 (2.36mm)	7.7	%	0-12
	#16 (1.18mm)	4.1	%	
	#30 (0.6mm)	3.2	%	
	#50 (0.3mm)	2.9	%	
	#100 (0.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	3.57	%	

Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Period: 06/02/2019 - 06/08/2019

Name/Title Doug Storey / QC Technician

Report Date 06/05/2019

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.1	%	95-100
	#8 (2.36mm)	82.7	%	65-95
	#16 (1.18mm)	69.7	%	35-75
	#30 (0.6mm)	53.4	%	20-55
	#50 (0.3mm)	24.7	%	10-30
	#100 (0.15mm)	8.5	%	0-10
	#200 (75µm)	2.7	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	4.24	%	