

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

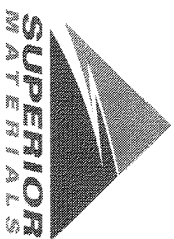
Sample Date: **6/1/20**

Dates Test Represents: **6/2/2020** through **6/8/2020**

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____



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

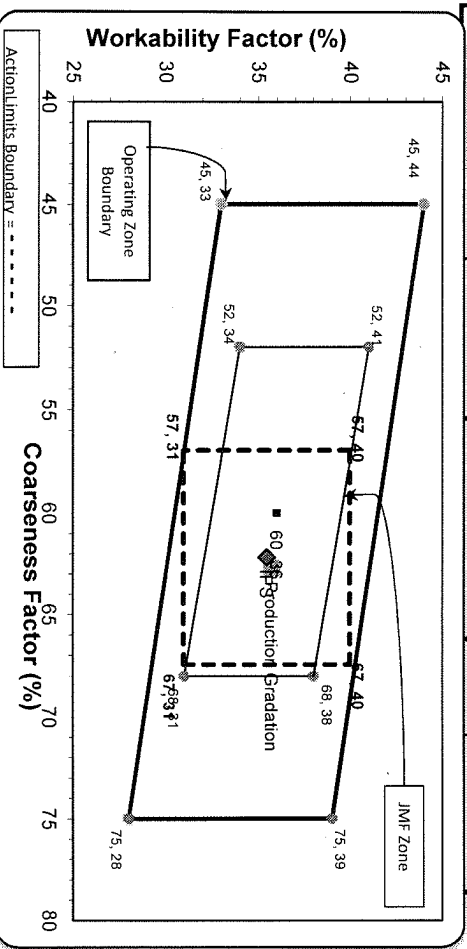
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1520	9.30	2.62	49.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
NNS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

Sieve	6AA	26A	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"	97.4	100.0	100.0	98.7	1.3	1.3
3/4"	81.9	100.0	100.0	91.0	9.0	9.0
1/2"	42.0	98.3	100.0	70.9	29.1	29.1
3/8"	21.6	87.5	100.0	59.7	40.3	40.3
#4	4.3	27.3	96.1	43.6	56.4	56.4
#8	2.5	9.0	83.3	35.7	64.3	64.3
#16	2.1	4.8	69.3	29.5	70.5	70.5
#30	2.0	3.9	46.8	20.3	79.7	79.7
#50	1.9	3.5	18.5	8.8	91.2	91.2
#100	1.7	3.2	4.5	3.0	97.0	97.0
LBW	1.2	2.2	1.0	1.2	98.8	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: **63** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	62	35	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

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.4	%	95-100
	3/4" (19mm)	81.9	%	
	1/2" (12.5mm)	42.0	%	30-60
	3/8" (9.5mm)	21.6	%	
	#4 (4.75mm)	4.3	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	2.7	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

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)	98.3	%	95-100
	3/8" (9.5mm)	87.5	%	60-95
	#4 (4.75mm)	27.3	%	5-30
	#8 (2.36mm)	9.0	%	0-12
	#16 (1.18mm)	4.8	%	
	#30 (.6mm)	3.9	%	
	#50 (.3mm)	3.5	%	
	#100 (.15mm)	3.2	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	1.9	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

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)	83.3	%	65-95
	#16 (1.18mm)	69.3	%	35-75
	#30 (.6mm)	46.8	%	20-55
	#50 (.3mm)	18.5	%	10-30
	#100 (.15mm)	4.5	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.82		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.5	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

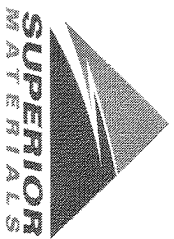
Sample Date: **6/1/20**

Dates Test Represents: **6/2/2020** through **6/8/2020**

Concrete Grade: **S2M**

Contractor: _____

MDOT No.: _____



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

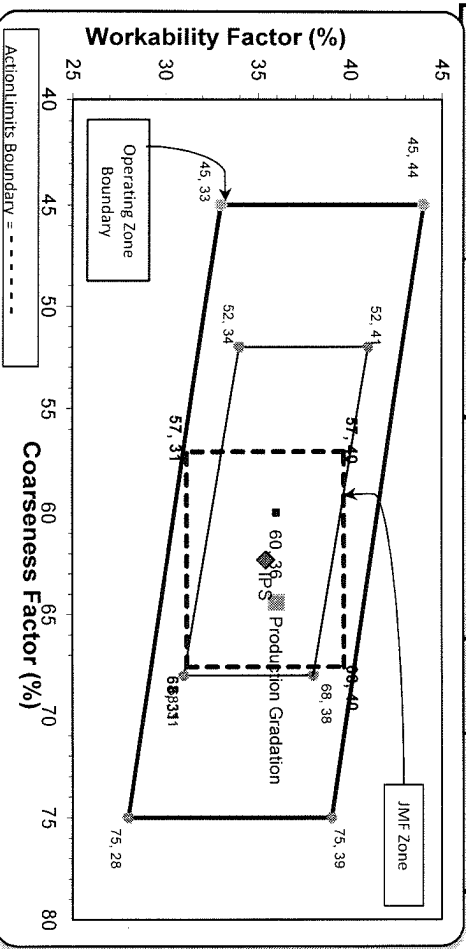
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1600	9.79	2.62	52.5
26A	71-47	Presque Isle	250	1.53	2.62	8.2
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
Total Wt			3050	18.57		100.0

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"	96.6	100.0	100.0	98.2	1.8	1.8
3/4"	80.8	100.0	100.0	89.9	8.3	10.1
1/2"	43.1	96.6	100.0	69.9	20.1	30.1
3/8"	24.6	79.6	100.0	58.8	11.1	41.2
#4	5.7	23.0	97.5	43.2	15.5	56.8
#8	3.1	8.9	85.5	36.0	7.2	64.0
#16	2.6	5.3	70.6	29.6	6.4	70.4
#30	2.5	4.5	50.1	21.4	8.2	78.6
#50	2.4	4.1	18.5	8.9	12.5	91.1
#100	2.2	3.7	2.9	2.6	6.3	97.4
LBW	1.8	2.8	0.3	1.3	1.3	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: **64** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	62	35	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: _____



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.6	%	95-100
	3/4" (19mm)	80.8	%	
	1/2" (12.5mm)	43.1	%	30-60
	3/8" (9.5mm)	24.6	%	
	#4 (4.75mm)	5.7	%	0-8
	#8 (2.36mm)	3.1	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	3.70	%	
AASHTO T11	-#200 (75um)	1.83	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

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)	79.6	%	60-95
	#4 (4.75mm)	23.0	%	5-30
	#8 (2.36mm)	8.9	%	0-12
	#16 (1.18mm)	5.3	%	
	#30 (.6mm)	4.5	%	
	#50 (.3mm)	4.1	%	
	#100 (.15mm)	3.7	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.7	%	0-3
	Total Moisture	3.05	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.5	%	95-100
	#8 (2.36mm)	85.5	%	65-95
	#16 (1.18mm)	70.6	%	35-75
	#30 (.6mm)	50.1	%	20-55
	#50 (.3mm)	18.5	%	10-30
	#100 (.15mm)	2.9	%	0-10
	#200 (75µm)	0.3	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	0.3	%	0-3
	Total Moisture	3.33	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

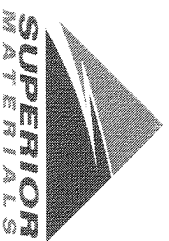
Sample Date: **6/1/20**

Dates Test Represents: **6/2/2020** through **6/8/2020**

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	100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.3	0.3
3/4"	14.7	14.9
1/2"	20.2	35.2
3/8"	8.8	44.0
#4	14.5	58.5
#8	8.9	67.4
#16	5.7	73.1
#30	6.9	80.0
#50	10.8	90.8
#100	5.7	96.6
LBW	2.3	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

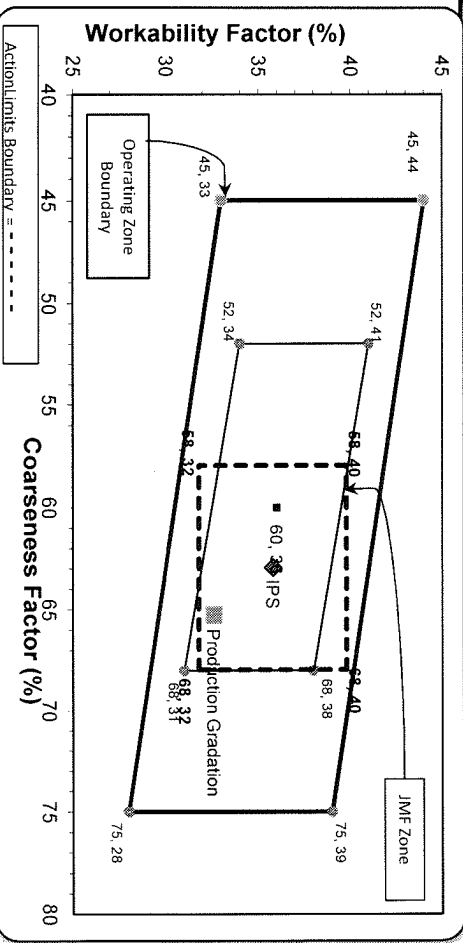
Initial Production Sample (IPS)

Coarseness Factor: **63**

Workability Factor: **33**

Coarseness Factor: **36**

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

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

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)	73.2	%	
	1/2" (12.5mm)	37.2	%	30-60
	3/8" (9.5mm)	22.8	%	
	#4 (4.75mm)	5.2	%	0-8
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.19	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	3.04	%	



Plant S39-Superior Sterling Heights

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

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)	80.5	%	60-95
	#4 (4.75mm)	17.8	%	5-30
	#8 (2.36mm)	5.5	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	2.36	%	



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/31/2020 - 06/06/2020

Report Date 06/05/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.0	%	95-100
	#8 (2.36mm)	78.2	%	65-95
	#16 (1.18mm)	64.6	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	20.3	%	10-30
	#100 (.15mm)	6.0	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.88		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.53	%	