

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

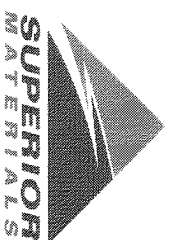
Sample Date: **4/18/22**

Dates Test Represents: **4/19/2022** through **4/25/2022**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



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

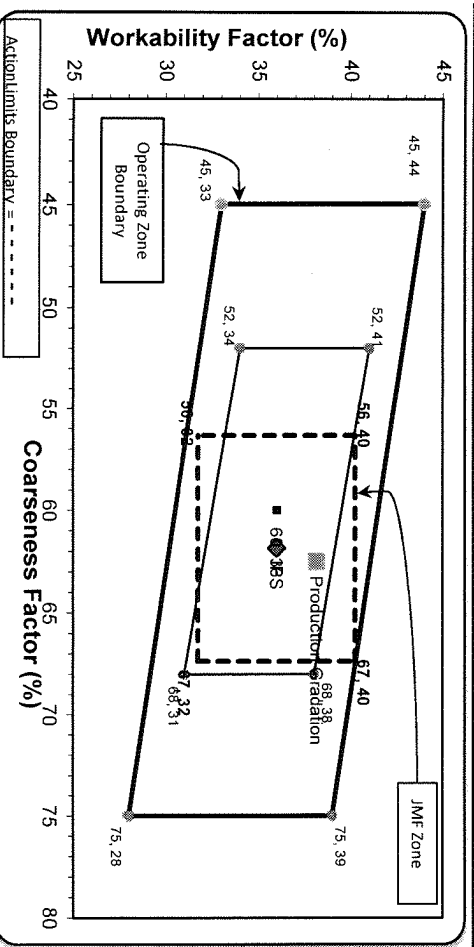
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	300	1.83	2.62	10.3
NNS	95-013	Smelter Bay	1150	6.95	2.65	39.6
			Total Wt	2905	17.69	100.0

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"	99.0	100.0	100.0	100.0	0.5	0.5
3/4"	89.7	100.0	100.0	94.8	4.7	5.2
1/2"	43.2	93.8	100.0	70.9	23.9	29.1
3/8"	23.3	82.6	100.0	59.8	11.1	40.2
#4	5.4	28.6	96.5	43.9	15.9	56.1
#8	2.7	10.3	84.0	35.7	8.2	64.3
#16	2.2	5.4	68.9	28.9	6.7	71.1
#30	2.0	4.2	49.2	20.9	8.0	79.1
#50	1.9	3.8	23.5	10.6	10.3	89.4
#100	1.8	3.5	6.7	3.9	6.7	96.1
LBW	1.4	3.0	1.7	1.7	2.2	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: **63** Workability Factor: **36** Adjusted WF: **38.2**



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"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 04/17/2022 - 04/23/2022

Report Date 04/23/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.5	%	95-100
	#8 (2.36mm)	84.0	%	65-95
	#16 (1.18mm)	68.9	%	35-75
	#30 (.6mm)	49.2	%	20-55
	#50 (.3mm)	23.5	%	10-30
	#100 (.15mm)	6.7	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	4.8	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 04/17/2022 - 04/23/2022

Report Date 04/23/2022

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)	93.8	%	95-100
	3/8" (9.5mm)	82.6	%	60-95
	#4 (4.75mm)	28.6	%	5-30
	#8 (2.36mm)	10.3	%	0-12
	#16 (1.18mm)	5.4	%	
	#30 (.6mm)	4.2	%	
	#50 (.3mm)	3.8	%	
	#100 (.15mm)	3.5	%	
	#200 (75µm)	3.2	%	
	Wash Loss (#200/75um)	3.0	%	0-3
	Total Moisture	3.5	%	

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 8911 W. Jefferson
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Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 04/17/2022 - 04/23/2022

Report Date 04/23/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.0	%	95-100
	3/4" (19mm)	89.7	%	
	1/2" (12.5mm)	43.2	%	30-60
	3/8" (9.5mm)	23.3	%	
	#4 (4.75mm)	5.4	%	0-8
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.2	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

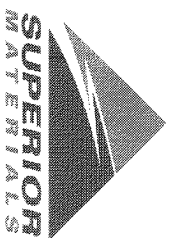
Sample Date: 4/18/22

Dates Test Represents: 4/19/2022 through 4/25/2022

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	71-47	Presque Isle	1505	9.21	2.62	51.8	
26A	71-47	Presque Isle	300	1.83	2.62	10.3	
2NS	44-051	Krake Willis Rd	1100	6.65	2.65	37.9	
Total Wt						2905	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"	97.0	100.0	100.0	98.4	1.6	1.6
3/4"	88.0	100.0	100.0	93.8	4.7	6.2
1/2"	47.5	97.6	100.0	72.6	21.2	27.4
3/8"	26.3	85.2	100.0	60.3	12.3	39.7
#4	4.8	15.0	95.4	40.2	20.1	59.8
#8	2.8	4.0	72.2	29.2	11.0	70.8
#16	2.5	2.4	56.9	23.1	6.1	76.9
#30	2.4	2.0	42.0	17.4	5.7	82.6
#50	2.3	1.8	22.5	9.9	7.5	90.1
#100	2.2	1.6	7.8	4.3	5.6	95.7
LBW	1.5	1.2	1.2	1.4	2.9	98.6

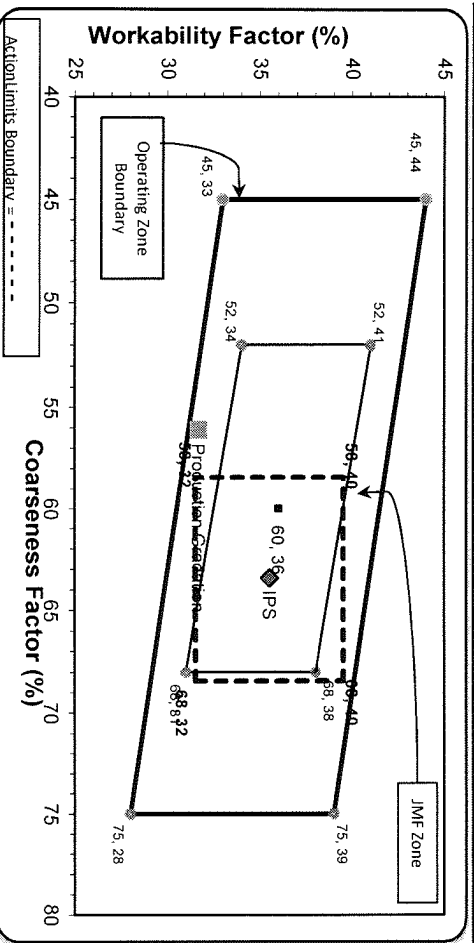
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max.
nom. max. #100 and #200 sieves.
**Retained must be at least 4% for each sieve except max.
nom. max. #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **56** Workability Factor: **29** Adjusted WF: **31.7**

Initial Production Sample (IPS)

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"	89.7	10.3	10.3
1/2"	70.3	19.4	29.7
3/8"	59.1	11.2	40.9
#4	42.8	16.3	57.2
#8	35.5	7.3	64.5
#16	29.0	6.5	71.0
#30	21.2	7.7	78.8
#50	9.8	11.5	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 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/17/2022 - 04/23/2022

Report Date 04/23/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.4	%	95-100
	#8 (2.36mm)	72.2	%	65-95
	#16 (1.18mm)	56.9	%	35-75
	#30 (.6mm)	42.0	%	20-55
	#50 (.3mm)	22.5	%	10-30
	#100 (.15mm)	7.8	%	0-10
	#200 (75µm)	1.5	%	
	FM	3.03		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	4.29	%	



Plant S39-Superior Sterling Heights
 Product 1067-26A Mod LS
 Period: 04/17/2022 - 04/23/2022

Name/Title Doug Storey / QC Technician
 Report Date 04/23/2022

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)	97.6	%	95-100
	3/8" (9.5mm)	85.2	%	60-95
	#4 (4.75mm)	15.0	%	5-30
	#8 (2.36mm)	4.0	%	0-12
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	3.40	%	



Plant S39-Superior Sterling Heights
Product 1051-6AA LS
Period: 04/17/2022 - 04/23/2022

Name/Title Doug Storey / QC Technician
Report Date 04/23/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.0	%	95-100
	3/4" (19mm)	88.0	%	
	1/2" (12.5mm)	47.5	%	30-60
	3/8" (9.5mm)	26.3	%	
	#4 (4.75mm)	4.8	%	0-8
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.88	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	3.67	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Sample Date: 4/18/22

Dates Test Represents: 4/19/2022 through 4/25/2022

Concrete Grade: DM-4500HP

Contractor: _____

MDOT No.: _____



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

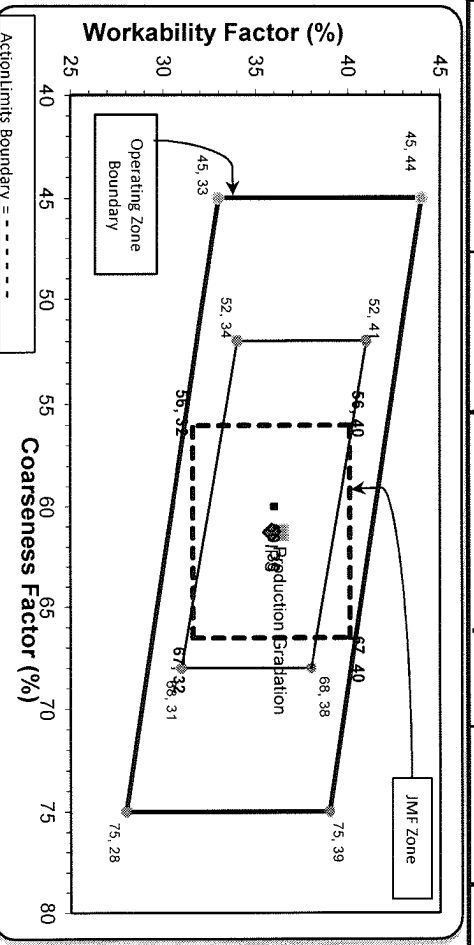
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution	
6AA	58-003	Stoneco	1600	9.53	2.69	54.1	
26A	58-003	Stoneco	205	1.22	2.69	6.9	
2NS	81-019	Pleasant Lake	1150	6.95	2.65	38.9	
Total Wt:						2955	100.0

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"	89.5	100.0	100.0	94.3	5.7	5.7
1/2"	51.9	100.0	100.0	74.0	20.4	26.0
3/8"	26.6	88.1	100.0	59.4	14.5	40.6
#4	6.1	12.6	99.2	42.8	16.6	57.2
#8	2.6	4.5	82.5	33.8	9.0	66.2
#16	1.9	3.3	65.3	26.7	7.2	73.3
#30	1.7	2.8	47.7	19.7	7.0	80.3
#50	1.6	2.6	23.1	10.0	9.6	90.0
#100	1.5	2.4	6.8	3.6	6.4	96.4
LBW	1.0	1.9	1.6	1.3	2.3	98.7

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 61 Workability Factor: 34 Adjusted WF: 36.3

Sieve	% 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



PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi
Product 1022-2NS GR
Period: 04/18/2022 - 04/20/2022

Name/Title Doug Storey / QC Technician
Report Date 04/23/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.2	%	95-100
	#8 (2.36mm)	82.5	%	65-95
	#16 (1.18mm)	65.3	%	35-75
	#30 (.6mm)	47.7	%	20-55
	#50 (.3mm)	23.1	%	10-30
	#100 (.15mm)	6.8	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	5.25	%	



Plant S102-Superior Novi
 Product 1067-26A Mod LS
 Period: 04/18/2022 - 04/20/2022

Name/Title Doug Storey / QC Technician
 Report Date 04/23/2022

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)	100.0	%	95-100
	3/8" (9.5mm)	88.1	%	60-95
	#4 (4.75mm)	12.6	%	5-30
	#8 (2.36mm)	4.5	%	0-12
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	4.63	%	



Plant S102-Superior Novi

Product 1051-6AA LS

Period: 04/18/2022 - 04/20/2022

Name/Title Doug Storey / QC Technician

Report Date 04/23/2022

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)	89.5	%	
	1/2" (12.5mm)	51.9	%	30-60
	3/8" (9.5mm)	26.6	%	
	#4 (4.75mm)	6.1	%	0-8
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.33	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	3.40	%	