

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **9/27/21**

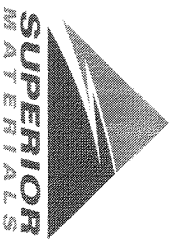
Dates Test Represents: **9/28/2021**

through **10/4/2021**

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	1650	10.09	2.62	54.1
26A	71-47	Presque Isle	170	1.04	2.62	5.6
NNS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	1.2	1.2
3/4"	10.2	11.4
1/2"	26.2	37.7
3/8"	12.8	50.4
#4	9.1	59.5
#8	5.2	64.7
#16	5.9	70.6
#30	7.1	77.7
#50	11.1	88.9
#100	7.8	96.7
LBW	2.4	99.0

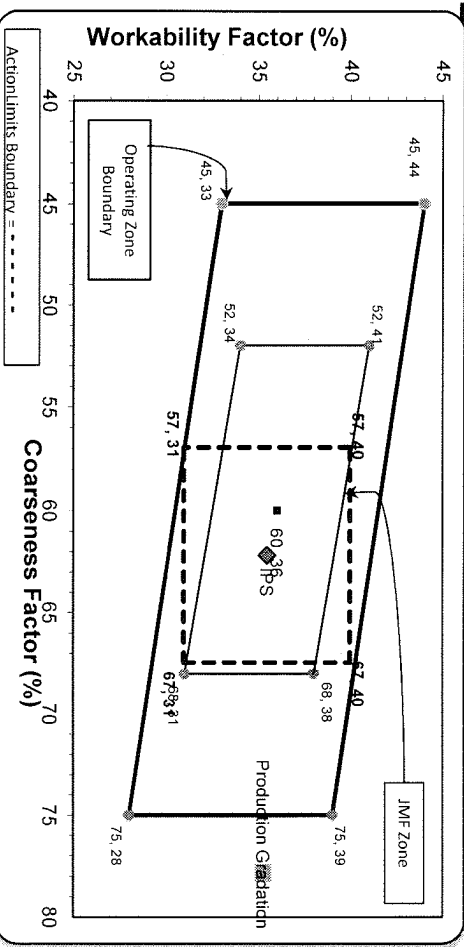
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max.
nom. max. #100 and #200 sieves.
** Retained must be at least 4% for each sieve except max.
nom. max. #100 and #200 sieves.
* Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. 1.5")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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

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

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 09/26/2021 - 10/02/2021

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.2	%	95-100
	#8 (2.36mm)	85.2	%	65-95
	#16 (1.18mm)	71.2	%	35-75
	#30 (.6mm)	53.6	%	20-55
	#50 (.3mm)	26.0	%	10-30
	#100 (.15mm)	6.8	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.61		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	3.6	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/26/2021 - 10/02/2021

Report Date 10/01/2021

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)	98.1	%	95-100
	3/8" (9.5mm)	84.7	%	60-95
	#4 (4.75mm)	18.9	%	5-30
	#8 (2.36mm)	5.4	%	0-12
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75µm)	1.7	%	0-3
	Total Moisture	3.8	%	

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 09/26/2021 - 10/02/2021

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.8	%	95-100
	3/4" (19mm)	78.9	%	
	1/2" (12.5mm)	30.6	%	30-60
	3/8" (9.5mm)	8.4	%	
	#4 (4.75mm)	1.2	%	0-8
	#8 (2.36mm)	1.1	%	
	#16 (1.18mm)	1.0	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.8	%	
	Wash Loss (#200/75um)	0.7	%	0-2
	Total Moisture	0.8	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-02

Contractor: _____

Sample Date: 9/27/21

MDOT No.: _____

Dates Test Represents: 9/28/2021 through 10/4/2021

Concrete Grade: S2M

Agg. 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	250	1.53	2.62	8.2
2NS	63-115	Ray Rd	1250	7.56	2.65	41.0
Total Wt						18.57
						100.0

Verify this number is 100%

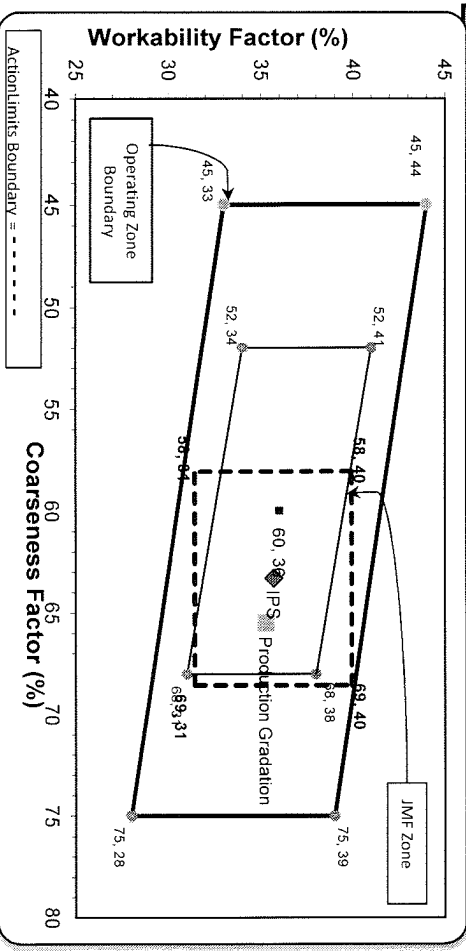
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.3	100.0	100.0	99.6	0.4	0.4
3/4"	85.3	100.0	100.0	92.5	7.1	7.5
1/2"	41.9	96.1	100.0	70.2	22.4	29.8
3/8"	19.1	84.3	100.0	57.6	12.6	42.4
#4	3.8	28.4	95.2	43.3	14.3	56.7
#8	2.4	9.8	81.1	35.3	8.0	64.7
#16	2.0	5.1	66.4	28.6	6.6	71.4
#30	1.9	3.8	51.3	22.3	6.3	77.7
#50	1.7	3.2	28.0	12.6	9.7	87.4
#100	1.6	2.9	8.4	4.5	8.1	95.5
LBW	1.2	2.3	0.8	1.1	3.4	98.9

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **65** Workability Factor: **35**

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"	95.6	4.4	4.4
1/2"	73.1	22.6	26.9
3/8"	59.3	13.8	40.7
#4	42.8	16.5	57.2
#8	35.7	7.1	64.3
#16	28.9	6.8	71.1
#30	20.7	8.2	79.3
#50	9.9	10.8	90.1
#100	2.1	7.8	97.9
LBW	0.9	1.2	99.1



*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. 1.5") aggregate is used.

PREPARED BY:
SM, LLC Technical Service

Approved By:



Plant S02-Superior Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/26/2021 - 10/02/2021

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.2	%	95-100
	#8 (2.36mm)	81.1	%	65-95
	#16 (1.18mm)	66.4	%	35-75
	#30 (.6mm)	51.3	%	20-55
	#50 (.3mm)	28.0	%	10-30
	#100 (.15mm)	8.4	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	3.78	%	



Plant S02-Superior Hoover

Product 1067-26A Mod LS

Period: 09/26/2021 - 10/02/2021

Name/Title Doug Storey / QC Technician

Report Date 10/01/2021

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)	96.1	%	95-100
	3/8" (9.5mm)	84.3	%	60-95
	#4 (4.75mm)	28.4	%	5-30
	#8 (2.36mm)	9.8	%	0-12
	#16 (1.18mm)	5.1	%	
	#30 (.6mm)	3.8	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	3.11	%	



Plant S02-Superior Hoover

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 09/26/2021 - 10/02/2021

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.3	%	95-100
	3/4" (19mm)	85.3	%	
	1/2" (12.5mm)	41.9	%	30-60
	3/8" (9.5mm)	19.1	%	
	#4 (4.75mm)	3.8	%	0-8
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.26	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	2.52	%	