

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

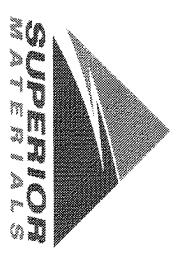
Sample Date: 10/17/22

Dates Test Represents: 10/18/2022 through 10/24/2022

Concrete Grade: DM 4500HP

Contractor: _____

MDOT No.: _____



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

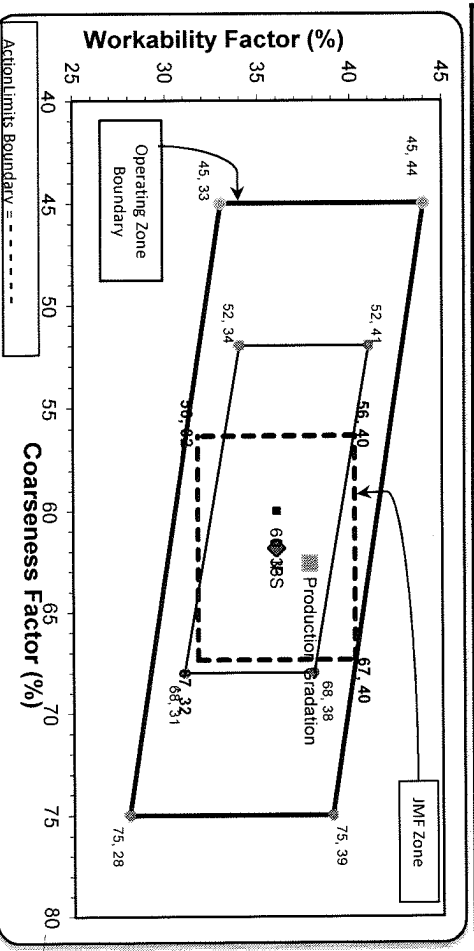
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1555	9.51	2.62	53.5
26A	71-47	Presque Isle	200	1.22	2.62	6.9
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
			Total Wt.	2905		100.0

Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	1.2	1.2
3/4"	6.3	7.4
1/2"	21.7	29.2
3/8"	11.3	40.5
#4	17.0	57.5
#8	7.2	64.7
#16	6.1	70.8
#30	7.7	78.6
#50	10.2	88.7
#100	7.0	95.7
LBW	2.6	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:** 35 **Adjusted WF:** 37.8



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"	95.0	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: 10/16/2022 - 10/22/2022

Report Date 10/21/2022

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)	84.3	%	65-95
	#16 (1.18mm)	69.9	%	35-75
	#30 (.6mm)	50.6	%	20-55
	#50 (.3mm)	25.1	%	10-30
	#100 (.15mm)	7.6	%	0-10
	#200 (75µm)	2.1	%	
	FM	2.66		2.6-3
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.2	%	

Plant 958-JMT
 Product 1067-26A Mod LS
 Period: 10/16/2022 - 10/22/2022

Name/Title Doug Storey / QC Technician
 Report Date 10/21/2022

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)	97.9	%	95-100
	3/8" (9.5mm)	85.5	%	60-95
	#4 (4.75mm)	22.6	%	5-30
	#8 (2.36mm)	6.3	%	0-12
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	2.6	%	

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 10/16/2022 - 10/22/2022

Report Date 10/21/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.8	%	95-100
	3/4" (19mm)	86.1	%	
	1/2" (12.5mm)	45.8	%	30-60
	3/8" (9.5mm)	26.2	%	
	#4 (4.75mm)	5.5	%	0-8
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.1	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 10/17/22

Dates Test Represents: 10/18/2022 through 10/24/2022

Concrete Grade: DM 4500HP

Contractor: _____

MDOT No.: _____



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

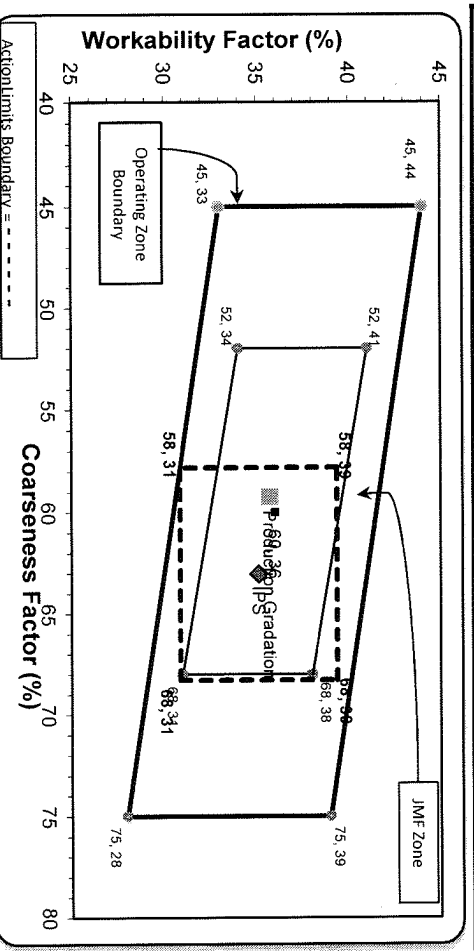
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %	
6AA	71-47	Presque Isle	1500	9.17	2.62	51.6	
26A	71-47	Presque Isle	305	1.87	2.62	10.5	
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9	
Total Wt:						2905	100.0

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"	98.7	100.0	100.0	99.3	0.7	0.7
3/4"	85.9	100.0	100.0	92.7	6.6	7.3
1/2"	49.0	95.6	100.0	73.2	19.5	26.8
3/8"	26.4	85.2	100.0	60.4	12.8	39.6
#4	4.0	20.3	97.9	41.3	19.2	58.7
#8	2.3	5.4	83.1	33.2	8.0	66.8
#16	2.0	2.5	67.1	26.7	6.5	73.3
#30	1.9	1.9	47.5	19.2	7.5	80.8
#50	1.8	1.8	17.9	7.9	11.3	92.1
#100	1.7	1.6	3.5	2.4	5.5	97.6
LBW	1.4	1.4	0.6	1.1	1.3	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.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 59 **Workability Factor:** 33 **Adjusted WF:** 35.7



Sieve	Initial Production Sample (IPS)	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	100.0	63	35	35.7
1.5"	100.0	63	35	35.7
1"	99.1	63	35	35.7
3/4"	90.3	63	35	35.7
1/2"	69.2	63	35	35.7
3/8"	59.1	63	35	35.7
#4	41.8	63	35	35.7
#8	35.1	63	35	35.7
#16	28.5	63	35	35.7
#30	21.2	63	35	35.7
#50	8.7	63	35	35.7
#100	1.8	63	35	35.7
LBW	0.7	63	35	35.7

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 10/16/2022 - 10/22/2022

Report Date 10/21/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.9	%	95-100
	#8 (2.36mm)	83.1	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	47.5	%	20-55
	#50 (.3mm)	17.9	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	0.8	%	
	FM	2.83		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	4.75	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 10/16/2022 - 10/22/2022

Report Date 10/21/2022

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)	95.6	%	95-100
	3/8" (9.5mm)	85.2	%	60-95
	#4 (4.75mm)	20.3	%	5-30
	#8 (2.36mm)	5.4	%	0-12
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	2.82	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 10/16/2022 - 10/22/2022

Report Date 10/22/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.7	%	95-100
	3/4" (19mm)	85.9	%	
	1/2" (12.5mm)	49.0	%	30-60
	3/8" (9.5mm)	26.4	%	
	#4 (4.75mm)	4.0	%	0-8
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
AASHTO T11	-#200 (75um)	1.49	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	2.91	%	