

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

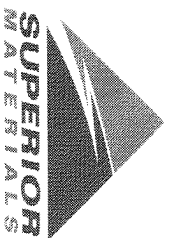
Sample Date: **7/25/22**

Dates Test Represents: **7/26/2022** through **8/1/2022**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MIDOT No.: _____



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

Verify this number is 100%

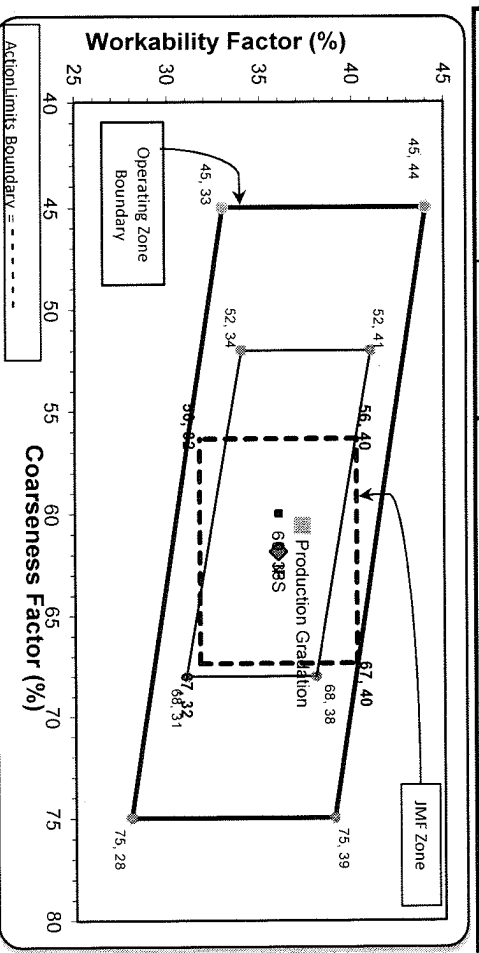
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1755	10.73	2.62	60.4
26A	71-47	Presque Isle	0	0.00	2.62	0.0
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	2905	17.69		100.0

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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	90.4	100.0	100.0	94.2	5.5	5.8
1/2"	58.4	95.8	100.0	74.9	19.3	25.1
3/8"	34.6	84.1	100.0	60.5	14.4	39.5
#4	7.4	30.4	96.6	42.7	17.8	57.3
#8	2.8	10.4	83.6	34.8	7.9	65.2
#16	2.2	4.8	68.5	28.4	6.3	71.6
#30	2.0	3.6	48.8	20.5	7.9	79.5
#50	1.9	3.2	23.3	10.4	10.2	89.6
#100	1.8	2.9	6.6	3.7	6.7	96.3
LBW	1.4	2.5	1.1	1.3	2.4	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: **61** Workability Factor: **35** Adjusted WF: **37.3**



Sieve	% Retained	Cumulative % Retained
2"	0.0	0.0
1.5"	0.0	0.0
1"	0.3	0.3
3/4"	5.5	5.8
1/2"	19.3	25.1
3/8"	14.4	39.5
#4	7.9	65.2
#8	6.3	71.6
#16	7.9	79.5
#30	10.2	89.6
#50	6.7	96.3
LBW	2.4	98.7

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: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.6	%	95-100
	#8 (2.36mm)	83.6	%	65-95
	#16 (1.18mm)	68.5	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	23.3	%	10-30
	#100 (.15mm)	6.6	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.73		2.6-3
	Wash Loss (#200/75µm)	1.1	%	0-3
	Total Moisture	3.7	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

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)	95.8	%	95-100
	3/8" (9.5mm)	84.1	%	60-95
	#4 (4.75mm)	30.4	%	5-30
	#8 (2.36mm)	10.4	%	0-12
	#16 (1.18mm)	4.8	%	
	#30 (.6mm)	3.6	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.7	%	

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.5	%	95-100
	3/4" (19mm)	90.4	%	
	1/2" (12.5mm)	58.4	%	30-60
	3/8" (9.5mm)	34.6	%	
	#4 (4.75mm)	7.4	%	0-8
	#8 (2.36mm)	2.8	%	
	#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	2.5	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

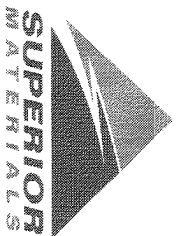
Sample Date: **7/25/22**

Dates Test Represents: **7/26/2022** through **8/1/2022**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



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

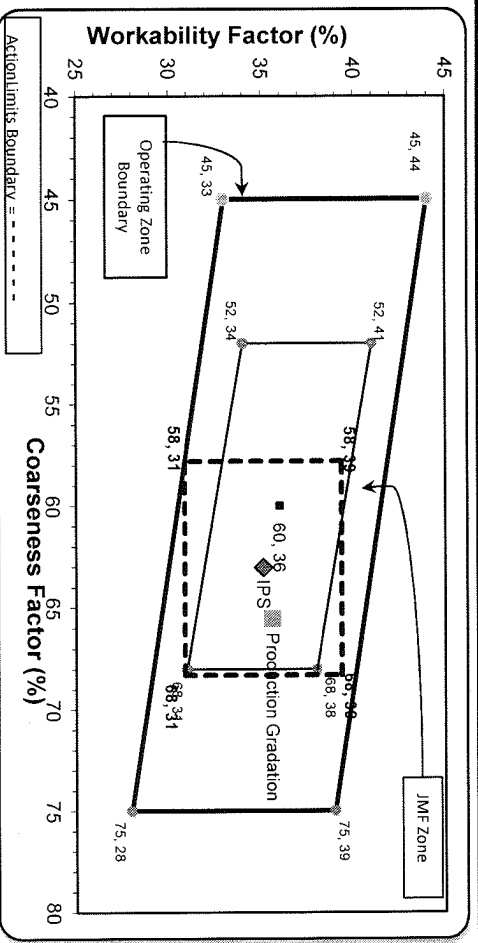
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1605	9.82	2.62	55.2
26A	71-47	Presque Isle	200	1.22	2.62	6.9
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9
Total Wt			2905	17.69		100.0

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"	96.8	100.0	100.0	98.2	1.8	1.8
3/4"	78.3	100.0	100.0	88.0	10.2	12.0
1/2"	42.2	96.5	100.0	67.8	20.2	32.2
3/8"	22.2	87.5	100.0	56.2	11.7	43.8
#4	4.4	28.9	98.0	41.5	14.6	58.5
#8	2.4	9.0	82.3	33.1	8.4	66.9
#16	2.0	4.1	66.8	26.7	6.4	73.3
#30	1.9	3.1	47.4	19.2	7.5	80.8
#50	1.8	2.8	17.3	7.7	11.5	92.3
#100	1.7	2.6	3.2	2.3	5.4	97.7
LBW	1.4	2.3	0.5	1.1	1.2	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: **66** Workability Factor: **33** Adjusted WF: **35.6**



Sieve	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	100.0	100.0	0.0
1.5"	100.0	100.0	0.0
1"	99.1	99.1	0.9
3/4"	90.3	90.3	8.8
1/2"	69.2	69.2	21.1
3/8"	59.1	59.1	10.1
#4	41.8	41.8	17.3
#8	35.1	35.1	6.6
#16	28.5	28.5	6.6
#30	21.2	21.2	7.3
#50	8.7	8.7	12.5
#100	1.8	1.8	7.0
LBW	0.7	0.7	1.0

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: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.0	%	95-100
	#8 (2.36mm)	82.3	%	65-95
	#16 (1.18mm)	66.8	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	17.3	%	10-30
	#100 (.15mm)	3.2	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.85		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	2.78	%	



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: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

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)	96.5	%	95-100
	3/8" (9.5mm)	87.5	%	60-95
	#4 (4.75mm)	28.9	%	5-30
	#8 (2.36mm)	9.0	%	0-12
	#16 (1.18mm)	4.1	%	
	#30 (.6mm)	3.1	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	2.86	%	



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: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.8	%	95-100
	3/4" (19mm)	78.3	%	
	1/2" (12.5mm)	42.2	%	30-60
	3/8" (9.5mm)	22.2	%	
	#4 (4.75mm)	4.4	%	0-8
	#8 (2.36mm)	2.4	%	
	#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)	1.48	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	2.06	%	