

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

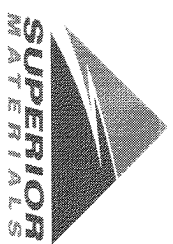
Sample Date: **8/11/22**

Dates Test Represents: **8/2/2022** through **8/8/2022**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



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

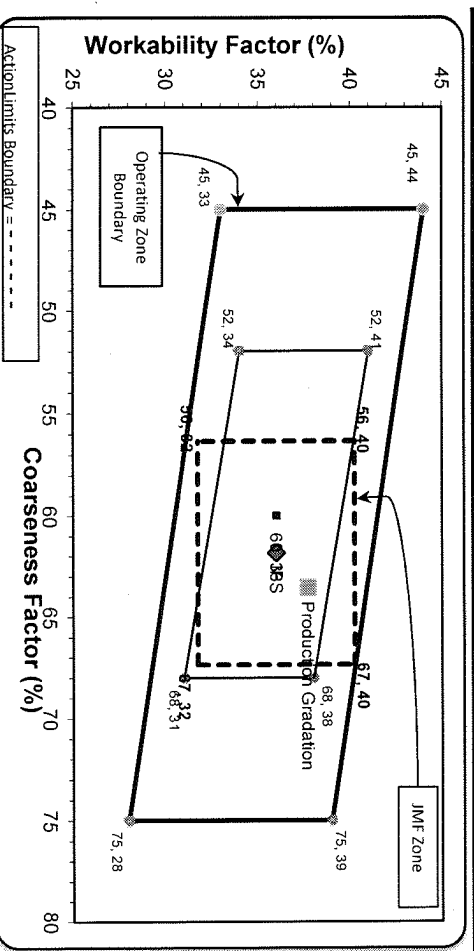
Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %	
6AA	71-47	Presque Isle	1555	9.51	2.62	53.5	
26A	71-47	Presque Isle	200	1.22	2.62	6.9	
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6	
Total Wt						2905	100.0

Sieve	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"	80.2	100.0	100.0	89.4	10.6	10.6
1/2"	43.6	96.3	100.0	69.6	19.8	30.4
3/8"	24.9	85.6	100.0	58.8	10.7	41.2
#4	4.4	28.1	96.8	42.6	16.2	57.4
#8	2.0	8.7	84.7	35.2	7.4	64.8
#16	1.8	4.0	69.2	28.6	6.6	71.4
#30	1.7	3.0	49.9	20.9	7.8	79.1
#50	1.6	2.7	24.5	10.7	10.1	89.3
#100	1.6	2.5	7.4	4.0	6.8	96.0
LBW	1.3	2.1	1.6	1.5	2.5	98.5

*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: **35** Adjusted WF: **37.7**



Sieve	Coarseness Factor:	Workability Factor:	Adjusted WF:
2"	100.0	100.0	100.0
1.5"	100.0	100.0	100.0
1"	100.0	100.0	100.0
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
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.8	%	95-100
	#8 (2.36mm)	84.7	%	65-95
	#16 (1.18mm)	69.2	%	35-75
	#30 (.6mm)	49.9	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.4	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 07/31/2022 - 08/06/2022

Report Date 08/05/2022

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)	96.3	%	95-100
	3/8" (9.5mm)	85.6	%	60-95
	#4 (4.75mm)	28.1	%	5-30
	#8 (2.36mm)	8.7	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	3.4	%	

Plant 958-JMT
 Product 1054-6AA LS PI
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	100.0	%	95-100
	3/4" (19mm)	80.2	%	
	1/2" (12.5mm)	43.6	%	30-60
	3/8" (9.5mm)	24.9	%	
	#4 (4.75mm)	4.4	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	1.0	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

Contractor: _____

Sample Date: **8/1/22**

MDOT No.: _____

Dates Test Represents: **8/2/2022** through **8/8/2022**

Concrete Grade: **DM, 4500HP**

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

<----- Verify this number is 100%

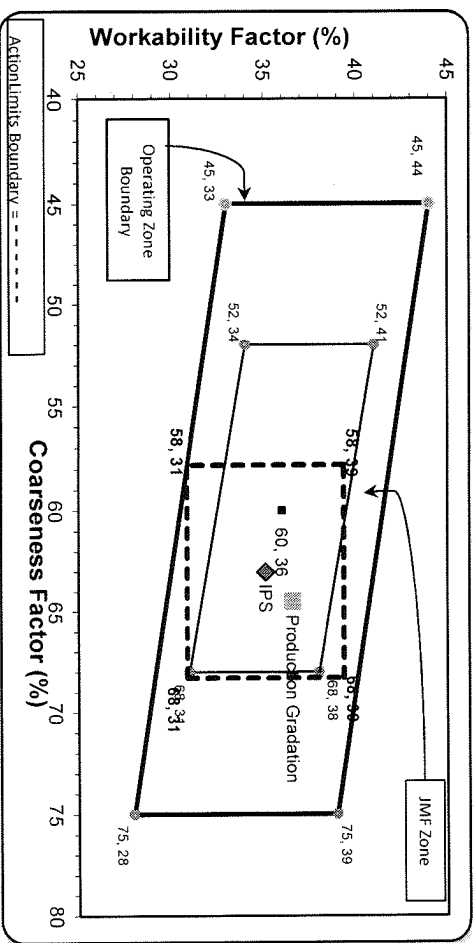
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	83.3	100.0	100.0	90.8	9.2	9.2
1/2"	44.2	96.0	100.0	68.9	21.9	31.1
3/8"	24.7	86.7	100.0	57.5	11.4	42.5
#4	4.2	31.4	97.6	41.4	16.0	58.6
#8	2.5	10.6	84.4	34.1	7.4	65.9
#16	2.1	5.1	70.2	28.1	6.0	71.9
#30	2.0	3.9	53.4	21.6	6.5	78.4
#50	1.9	3.5	24.6	10.6	11.0	89.4
#100	1.8	3.2	5.1	3.1	7.5	96.9
LBW	1.6	2.8	1.0	1.5	1.7	98.5

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor:	64	Workability Factor:	34	Adjusted WF:	36.6
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Initial Production Sample (IPS)

Sieve	Coarseness Factor:	63	Workability Factor:	35	Cumulative % Retained
2"	100.0	0.0	0.0	0.0	
1.5"	100.0	0.0	0.0	0.0	
1"	99.1	0.9	0.9	0.9	
3/4"	90.3	8.8	9.7	30.8	
1/2"	69.2	21.1	10.1	40.9	
3/8"	59.1	10.1	17.3	58.2	
#4	41.8	17.3	6.6	64.9	
#8	35.1	6.6	6.6	71.5	
#16	28.5	6.6	7.3	78.8	
#30	21.2	7.3	12.5	91.3	
#50	8.7	7.0	98.2	98.2	
#100	1.8	7.0	99.3	99.3	
LBW	0.7	1.0			



*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. Max. 1.5") aggregate is used.

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

Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician

Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.6	%	95-100
	#8 (2.36mm)	84.4	%	65-95
	#16 (1.18mm)	70.2	%	35-75
	#30 (.6mm)	53.4	%	20-55
	#50 (.3mm)	24.6	%	10-30
	#100 (.15mm)	5.1	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.43	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician

Report Date 08/05/2022

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)	96.0	%	95-100
	3/8" (9.5mm)	86.7	%	60-95
	#4 (4.75mm)	31.4	%	5-30
	#8 (2.36mm)	10.6	%	0-12
	#16 (1.18mm)	5.1	%	
	#30 (.6mm)	3.9	%	
	#50 (.3mm)	3.5	%	
	#100 (.15mm)	3.2	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75µm)	2.8	%	0-3
	Total Moisture	2.50	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
 Product 1051-6AA LS
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

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)	83.3	%	
	1/2" (12.5mm)	44.2	%	30-60
	3/8" (9.5mm)	24.7	%	
	#4 (4.75mm)	4.2	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
AASHTO T11	-#200 (75um)	1.65	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.41	%	