

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **8/15/22**

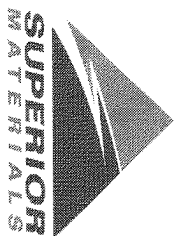
Dates Test Represents: **8/16/2022** through **8/22/2022**

Concrete Grade: **S2M, 3500HP**

Contractor: _____
MIDOT No.: _____

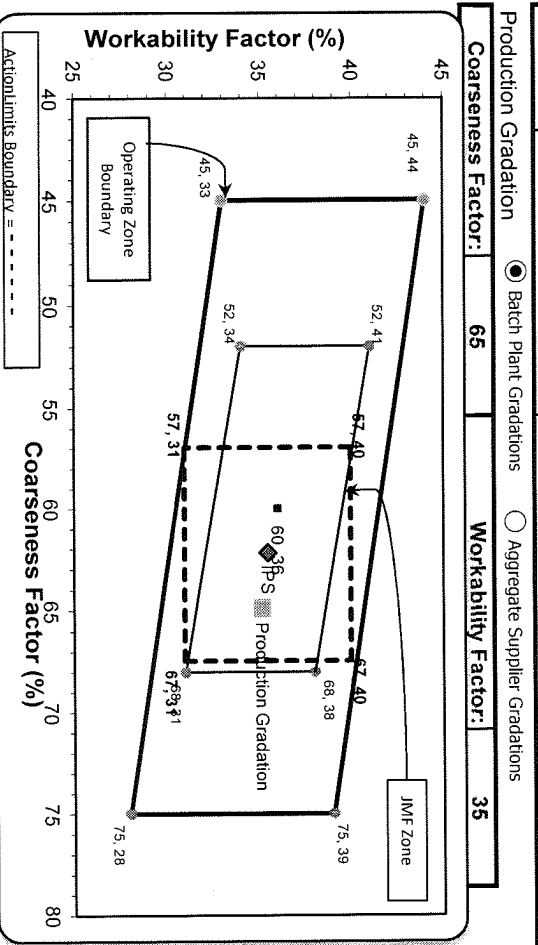
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1620	9.91	2.62	53.1
26A	71-47	Presque Isle	200	1.22	2.62	6.6
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

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"	98.0	100.0	100.0	98.9	1.1	1.1
3/4"	83.0	100.0	100.0	91.0	8.0	9.0
1/2"	43.9	95.9	100.0	69.9	21.0	30.1
3/8"	22.6	85.1	100.0	57.9	12.0	42.1
#4	4.2	26.0	95.9	42.6	15.3	57.4
#8	2.2	8.2	82.9	35.1	7.5	64.9
#16	1.9	4.1	67.9	28.7	6.5	71.3
#30	1.8	3.3	49.2	21.0	7.6	79.0
#50	1.7	2.6	24.7	11.0	10.0	89.0
#100	1.5	2.4	7.8	4.1	6.9	95.9
LBW	1.2	2.0	1.3	1.3	2.8	98.7



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

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

Sieve	Initial Production Sample (IPS)	Coarseness Factor:	Workability Factor:
2"	100.0	62	35
1.5"	100.0		
1"	100.0		
3/4"	94.0		
1/2"	70.2		
3/8"	59.9		
#4	42.7		
#8	35.5		
#16	28.4		
#30	19.2		
#50	8.9		
#100	3.1		
LBW	1.4		

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT
 Product 1022-2NS GR - Smelter Bay
 Period: 08/14/2022 - 08/20/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/19/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.9	%	95-100
	#8 (2.36mm)	82.9	%	65-95
	#16 (1.18mm)	67.9	%	35-75
	#30 (.6mm)	49.2	%	20-55
	#50 (.3mm)	24.7	%	10-30
	#100 (.15mm)	7.8	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3

Plant 958-JMT
 Product 1067-26A Mod LS
 Period: 08/14/2022 - 08/20/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/19/2022

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)	95.9	%	95-100
	3/8" (9.5mm)	85.1	%	60-95
	#4 (4.75mm)	26.0	%	5-30
	#8 (2.36mm)	8.2	%	0-12
	#16 (1.18mm)	4.1	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	2.0	%	0-3

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 08/14/2022 - 08/20/2022

Report Date 08/19/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.0	%	95-100
	3/4" (19mm)	83.0	%	
	1/2" (12.5mm)	43.9	%	30-60
	3/8" (9.5mm)	22.6	%	
	#4 (4.75mm)	4.2	%	0-8
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75µm)	1.2	%	0-2

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 8/15/22

Dates Test Represents: 8/16/2022 through 8/22/2022

Concrete Grade: S2M 3500HP

Contractor: _____

MDOT No.: _____

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	300	1.83	2.62	9.8
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
Total Wt						18.57
						100.0

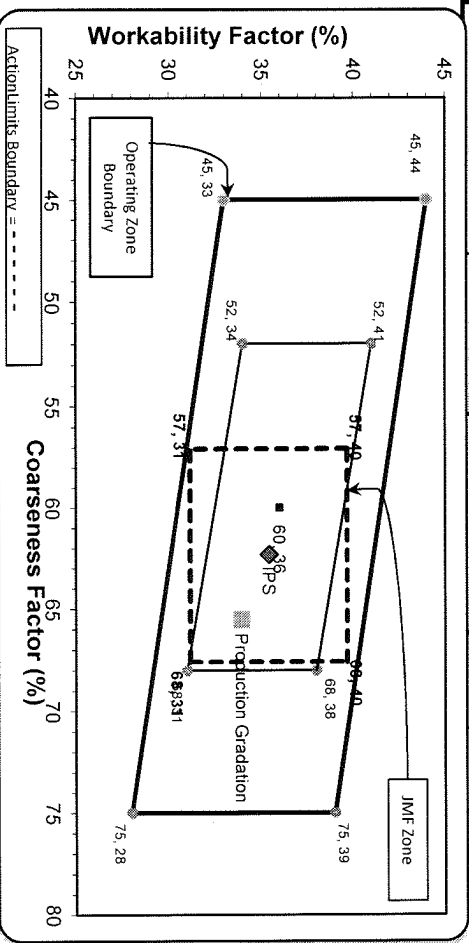
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	95.9	100.0	100.0	97.9	2.1	2.1
3/4"	76.6	100.0	100.0	88.1	9.8	11.9
1/2"	36.0	95.8	100.0	67.1	21.0	32.9
3/8"	18.4	81.7	100.0	56.7	10.3	43.3
#4	3.6	22.2	96.9	42.1	14.6	57.9
#8	2.2	6.6	81.8	34.0	8.2	66.0
#16	2.0	3.3	66.1	27.3	6.6	72.7
#30	1.9	2.6	47.5	19.9	7.4	80.1
#50	1.7	2.3	18.8	8.5	11.4	91.5
#100	1.6	2.1	3.6	2.4	6.1	97.6
LBW	1.2	1.7	0.4	0.9	1.5	99.1

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

Production Gradation	Batch Plant Gradations	Aggregate Supplier Gradations
Coarseness Factor: 66	Workability Factor: 34	

Initial Production Sample (IPS)

Sieve	Coarseness Factor: 62	Workability Factor: 35
2"	100.0	0.0
1.5"	100.0	0.0
1"	99.1	0.9
3/4"	90.5	8.6
1/2"	69.8	20.7
3/8"	59.8	10.0
#4	42.2	17.6
#8	35.4	6.7
#16	28.8	6.7
#30	21.4	7.4
#50	8.8	12.6
#100	1.8	7.0
LBW	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
Period: 08/14/2022 - 08/20/2022

Name/Title Doug Storey / QC Technician
Report Date 08/19/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.9	%	95-100
	#8 (2.36mm)	81.8	%	65-95
	#16 (1.18mm)	66.1	%	35-75
	#30 (.6mm)	47.5	%	20-55
	#50 (.3mm)	18.8	%	10-30
	#100 (.15mm)	3.6	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.85		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3
	Total Moisture	3.07	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
 Product 1067-26A Mod LS
 Period: 08/14/2022 - 08/20/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/19/2022

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)	95.8	%	95-100
	3/8" (9.5mm)	81.7	%	60-95
	#4 (4.75mm)	22.2	%	5-30
	#8 (2.36mm)	6.6	%	0-12
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.32	%	



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: 08/14/2022 - 08/20/2022

Report Date 08/19/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	95.9	%	95-100
	3/4" (19mm)	76.6	%	
	1/2" (12.5mm)	36.0	%	30-60
	3/8" (9.5mm)	18.4	%	
	#4 (4.75mm)	3.6	%	0-8
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.3	%	
AASHTO T11	#200 (75um)	1.30	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	2.07	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-02

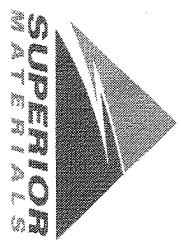
Sample Date: 8/15/22

Dates Test Represents: 8/16/2022 through 8/22/2022

Concrete Grade: **S2M, 3500HP**

Contractor: _____

MDOT No.: _____



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

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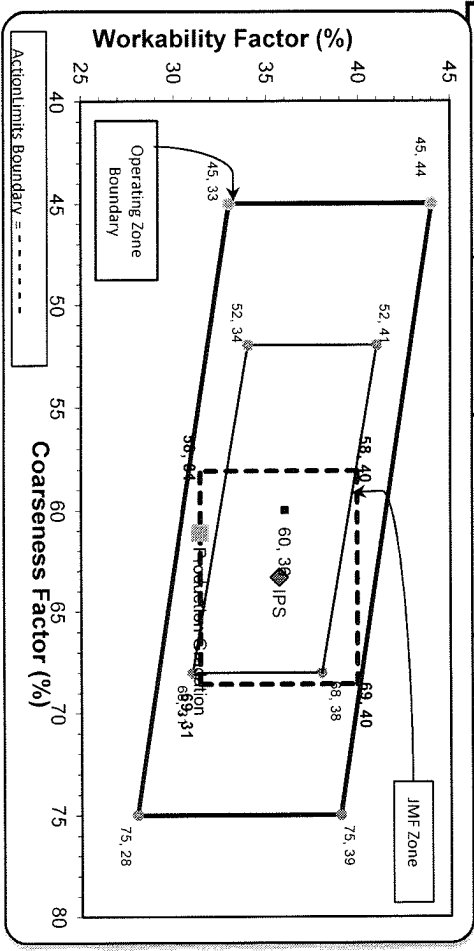
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1600	9.79	2.62	52.5
26A	71-47	Presque Isle	220	1.35	2.62	7.2
2NS	63-115	Ray Rd	1230	7.44	2.65	40.3
		Total Wt	3050	18.57		100.0

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"	98.6	100.0	100.0	99.3	0.7	0.7
3/4"	82.2	100.0	100.0	90.7	8.6	9.3
1/2"	42.0	95.0	100.0	69.2	21.4	30.8
3/8"	21.9	86.8	100.0	58.1	11.1	41.9
#4	2.6	22.1	95.7	41.6	16.5	58.4
#8	1.7	5.5	74.7	31.4	10.1	68.6
#16	1.5	2.6	58.7	24.6	6.8	75.4
#30	1.5	2.1	45.1	19.1	5.5	80.9
#50	1.4	1.9	26.7	11.6	7.5	88.4
#100	1.4	1.9	8.7	4.4	7.3	95.6
LBW	1.2	1.7	1.1	1.2	3.2	98.8

*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: **31**



Initial Production Sample (IPS)

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

Coarseness Factor: **63**
 Workability Factor: **36**

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S02-Superior Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 08/14/2022 - 08/20/2022

Report Date 08/19/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	74.7	%	65-95
	#16 (1.18mm)	58.7	%	35-75
	#30 (.6mm)	45.1	%	20-55
	#50 (.3mm)	26.7	%	10-30
	#100 (.15mm)	8.7	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.90		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	4.33	%	



Plant S02-Superior Hoover

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 08/14/2022 - 08/20/2022

Report Date 08/19/2022

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)	95.0	%	95-100
	3/8" (9.5mm)	86.8	%	60-95
	#4 (4.75mm)	22.1	%	5-30
	#8 (2.36mm)	5.5	%	0-12
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.41	%	



Plant S02-Superior Hoover

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 08/14/2022 - 08/20/2022

Report Date 08/19/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.6	%	95-100
	3/4" (19mm)	82.2	%	
	1/2" (12.5mm)	42.0	%	30-60
	3/8" (9.5mm)	21.9	%	
	#4 (4.75mm)	2.6	%	0-8
	#8 (2.36mm)	1.7	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.26	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	2.29	%	