

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 5/8/23

Dates Test Represents: 5/9/2023 through 5/15/2023

Concrete Grade: S2M, 3500HP

Contractor: _____

MDOT No.: _____



Superior Materials, LLC
30701 W. 10 Mile Rd.
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Verify this number is 100%

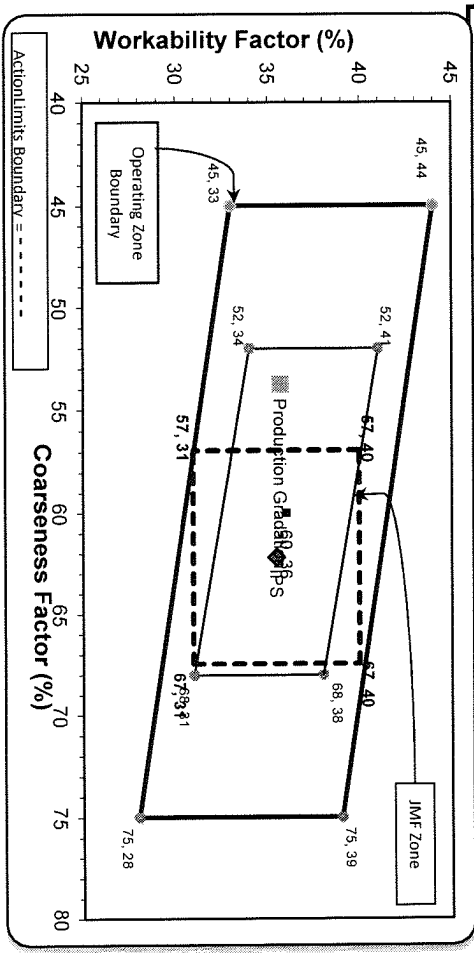
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1500	9.17	2.62	49.2
26A	71-47	Presque Isle	320	1.96	2.62	10.5
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

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"	99.1	100.0	100.0	99.6	0.4	0.4
3/4"	86.8	100.0	100.0	93.5	6.0	6.5
1/2"	51.4	97.1	100.0	75.8	17.7	24.2
3/8"	32.3	87.7	100.0	65.4	10.4	34.6
#4	7.0	25.2	96.9	45.2	20.3	54.8
#8	2.0	6.6	84.3	35.7	9.5	64.3
#16	1.6	3.7	68.7	28.9	8.2	71.1
#30	1.5	3.2	48.6	20.7	8.2	79.3
#50	1.5	2.9	23.1	10.4	10.3	89.6
#100	1.4	2.8	6.7	3.7	6.7	96.3
LBW	1.2	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: 54 Workability Factor: 36



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"	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

Coarseness Factor: 62 Workability Factor: 35

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1054-6AA LS PI

Period: 05/07/2023 - 05/13/2023

Name/Title Doug Storey / QC Technician

Report Date 05/12/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.1	%	95-100
	3/4" (19mm)	86.8	%	
	1/2" (12.5mm)	51.4	%	30-60
	3/8" (9.5mm)	32.3	%	
	#4 (4.75mm)	7.0	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	2.5	%	

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 05/07/2023 - 05/13/2023

Report Date 05/12/2023

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)	97.1	%	95-100
	3/8" (9.5mm)	87.7	%	60-95
	#4 (4.75mm)	25.2	%	5-30
	#8 (2.36mm)	6.6	%	0-12
	#16 (1.18mm)	3.7	%	
	#30 (.6mm)	3.2	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.5	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 05/07/2023 - 05/13/2023

Report Date 05/12/2023

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)	84.3	%	65-95
	#16 (1.18mm)	68.7	%	35-75
	#30 (.6mm)	48.6	%	20-55
	#50 (.3mm)	23.1	%	10-30
	#100 (.15mm)	6.7	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	4.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

Sample Date: **5/8/23**

Dates Test Represents: **5/9/2023**

through **5/15/2023**

Concrete Grade: **S2M, 3500HP**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stoneco	1600	9.53	2.69	51.6
26A	58-003	Stoneco	300	1.79	2.69	9.7
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7
Total Wt						3100
						18.58

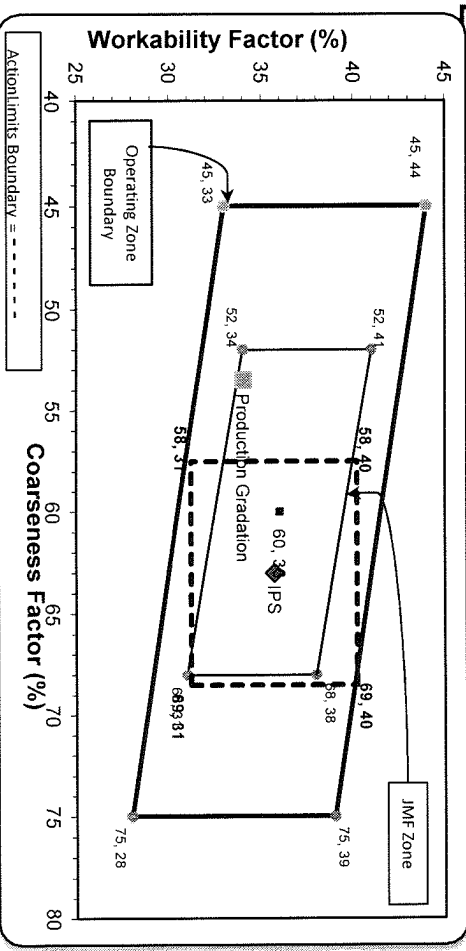
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	90.7	100.0	100.0	95.2	4.8	4.8
1/2"	55.1	99.2	100.0	76.7	18.5	23.3
3/8"	34.3	85.9	100.0	64.7	12.0	35.3
#4	5.1	11.9	98.3	41.8	22.9	58.2
#8	2.0	3.9	84.3	34.0	7.8	66.0
#16	1.6	2.8	67.4	27.2	6.9	72.8
#30	1.5	2.4	48.9	19.9	7.3	80.1
#50	1.4	2.3	23.6	10.1	9.9	89.9
#100	1.4	2.2	6.7	3.5	6.6	96.5
LBW	1.2	2.0	1.2	1.3	2.3	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. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **53** Workability Factor: **34**



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"	99.2	0.8	0.8
3/4"	90.9	8.3	9.1
1/2"	71.3	19.6	28.7
3/8"	59.5	11.8	40.5
#4	43.8	15.7	56.2
#8	35.7	8.1	64.3
#16	27.0	8.7	73.0
#30	18.6	8.4	81.4
#50	6.8	11.8	93.2
#100	1.4	5.4	98.6
LBW	0.6	0.8	99.4

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



PREPARED BY:
SM, LLC Technical Service

Approved By:



Plant S102-Superior Novi

Product 1051-6AA LS

Period: 05/07/2023 - 05/13/2023

Name/Title Doug Storey / QC Technician

Report Date 05/12/2023

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)	90.7	%	
	1/2" (12.5mm)	55.1	%	30-60
	3/8" (9.5mm)	34.3	%	
	#4 (4.75mm)	5.1	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.27	%	
	Wash Loss (#200/75µm)	1.2	%	0-2
	Total Moisture	2.43	%	



Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 05/07/2023 - 05/13/2023

Name/Title Doug Storey / QC Technician

Report Date 05/12/2023

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)	99.2	%	95-100
	3/8" (9.5mm)	85.9	%	60-95
	#4 (4.75mm)	11.9	%	5-30
	#8 (2.36mm)	3.9	%	0-12
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75µm)	2.0	%	0-3
	Total Moisture	3.74	%	



Plant S102-Superior Novi

Product 1022-2NS GR

Period: 05/07/2023 - 05/13/2023

Name/Title Doug Storey / QC Technician

Report Date 05/12/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.3	%	95-100
	#8 (2.36mm)	84.3	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	48.9	%	20-55
	#50 (.3mm)	23.6	%	10-30
	#100 (.15mm)	6.7	%	0-10
	#200 (75µm)	1.5	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	4.27	%	