

Aggregate Optimization Chart

PLANT #: **20**

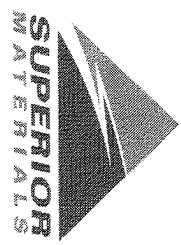
Sample Date: **8/21/23**

Dates Test Represents: **8/22/2023** through **8/28/2023**

Concrete Grade: **S2M 3500HP**

Contractor: _____

MDOT No.: _____



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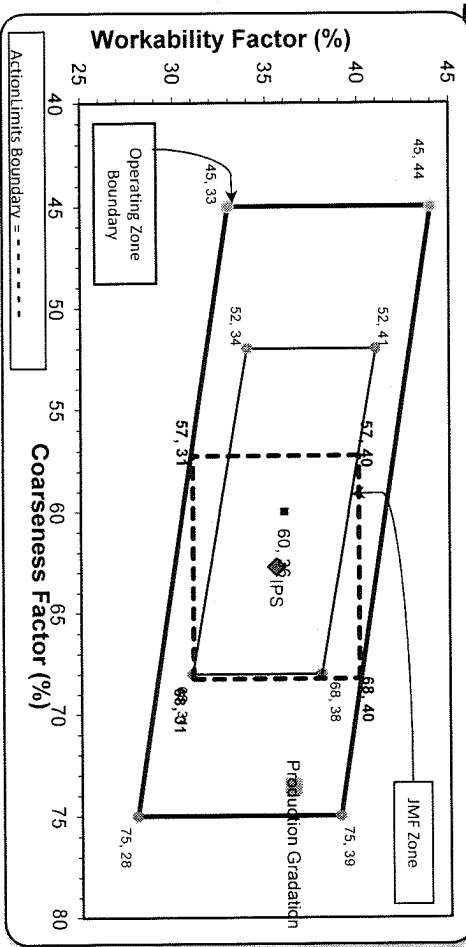
Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	71-47	Presque Isle	1650	10.09	2.62	54.1
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	63-92	Grange Hall	1250	7.56	2.65	41.0
Total Wt			3050	18.57		100.0

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"	97.5	100.0	100.0	98.6	1.4	1.4
3/4"	75.4	100.0	100.0	86.7	12.0	13.3
1/2"	30.5	96.2	100.0	62.2	24.5	37.8
3/8"	15.0	84.1	100.0	53.2	9.0	46.8
#4	3.2	20.6	97.6	42.7	10.5	57.3
#8	2.3	6.8	85.0	36.4	6.3	63.6
#16	2.1	4.0	70.2	30.1	6.3	69.9
#30	2.0	3.3	51.9	22.5	7.6	77.5
#50	1.9	2.9	21.2	9.9	12.7	90.1
#100	1.8	2.7	3.2	2.4	7.4	97.6
LBW	1.4	2.3	0.5	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **74** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	63	36	100.0	0.0	0.0
1.5"			100.0	0.0	0.0
1"			100.0	0.0	0.0
3/4"			93.3	6.7	6.7
1/2"			70.6	22.6	29.4
3/8"			59.6	11.0	40.4
#4			43.9	15.7	56.1
#8			35.6	8.4	64.4
#16			28.4	7.2	71.6
#30			19.4	9.0	80.6
#50			7.5	11.9	92.5
#100			0.9	6.6	99.1
LBW			0.9	0.1	99.1

PREPARED BY:
SM, LLC Technical Service

Approved By:



Plant S20-Superior Flint
Product 1051-6AA LS
Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
Report Date 08/27/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.5	%	95-100
	3/4" (19mm)	75.4	%	
	1/2" (12.5mm)	30.5	%	30-60
	3/8" (9.5mm)	15.0	%	
	#4 (4.75mm)	3.2	%	0-8
	#8 (2.36mm)	2.3	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.59	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	3.00	%	



Plant S20-Superior Flint
 Product 1067-26A Mod LS
 Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
 Report Date 08/27/2023

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)	96.2	%	95-100
	3/8" (9.5mm)	84.1	%	60-95
	#4 (4.75mm)	20.6	%	5-30
	#8 (2.36mm)	6.8	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	2.11	%	



Plant S20-Superior Flint
 Product 1022-2NS GR
 Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
 Report Date 08/27/2023

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)	85.0	%	65-95
	#16 (1.18mm)	70.2	%	35-75
	#30 (.6mm)	51.9	%	20-55
	#50 (.3mm)	21.2	%	10-30
	#100 (.15mm)	3.2	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.01	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **8/21/23**

Dates Test Represents: **8/22/2023** through **8/28/2023**

Concrete Grade: **S2M, 3500HP**

Contractor: _____

MDOT No.: _____

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
ZNS	95-013	Smelter Bay	1230	7.44	2.65	40.3
Total Wt			3050	18.57		100.0

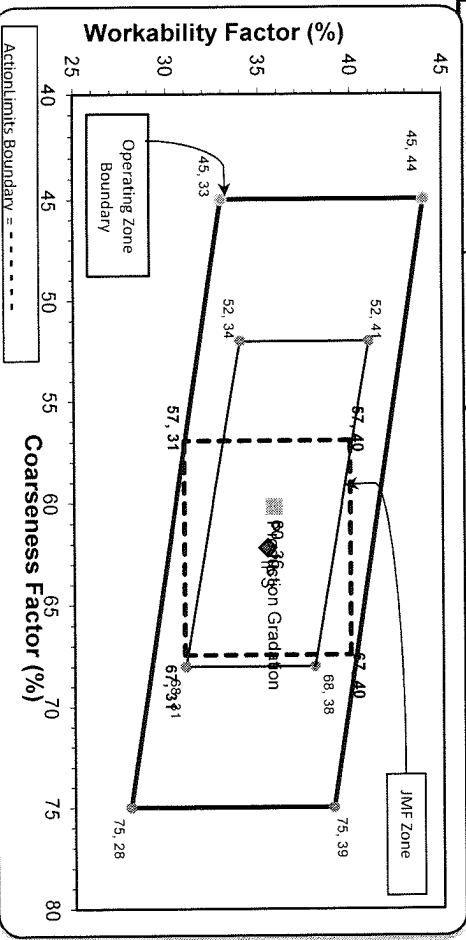
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Sieve	6AA	26A	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.6	100.0	100.0	98.8	1.2	1.2
3/4"	81.8	100.0	100.0	91.0	7.8	9.0
1/2"	42.2	96.4	100.0	71.2	19.9	28.8
3/8"	24.5	85.7	100.0	61.4	9.8	38.6
#4	4.3	19.9	96.4	43.1	18.3	56.9
#8	2.0	5.3	85.0	35.8	7.3	64.2
#16	1.8	2.9	70.0	29.4	6.4	70.6
#30	1.7	2.5	50.3	21.4	8.0	78.6
#50	1.6	2.2	24.1	10.7	10.6	89.3
#100	1.5	2.1	7.1	3.8	6.9	96.2
LBW	1.3	1.7	1.5	1.4	2.4	98.6

*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 4% for the 3/4" sieve when
 a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **60** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	62	35	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

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant: 958-JMT
Product: 1054-6AA LS PI
Period: 08/20/2023 - 08/26/2023

Name/Title: Doug Storey / QC Technician
Report Date: 08/27/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.6	%	95-100
	3/4" (19mm)	81.8	%	
	1/2" (12.5mm)	42.2	%	30-60
	3/8" (9.5mm)	24.5	%	
	#4 (4.75mm)	4.3	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	4.2	%	

Plant 958-JMT
 Product 1067-26A Mod LS
 Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
 Report Date 08/27/2023

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)	96.4	%	95-100
	3/8" (9.5mm)	85.7	%	60-95
	#4 (4.75mm)	19.9	%	5-30
	#8 (2.36mm)	5.3	%	0-12
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.8	%	

Plant 958-JMT
 Product 1022-2NS GR - Smelter Bay
 Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
 Report Date 08/27/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	85.0	%	65-95
	#16 (1.18mm)	70.0	%	35-75
	#30 (.6mm)	50.3	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	7.1	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	4.1	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

Sample Date: **8/21/23**

Dates Test Represents: **8/22/2023** through **8/28/2023**

Concrete Grade: **S2M, 3500HP**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
6AA	58-003	Stonoco	1650	9.83	2.69	53.2
26A	58-003	Stonoco	250	1.49	2.69	8.1
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7
Total Wt						18.58
						100.0

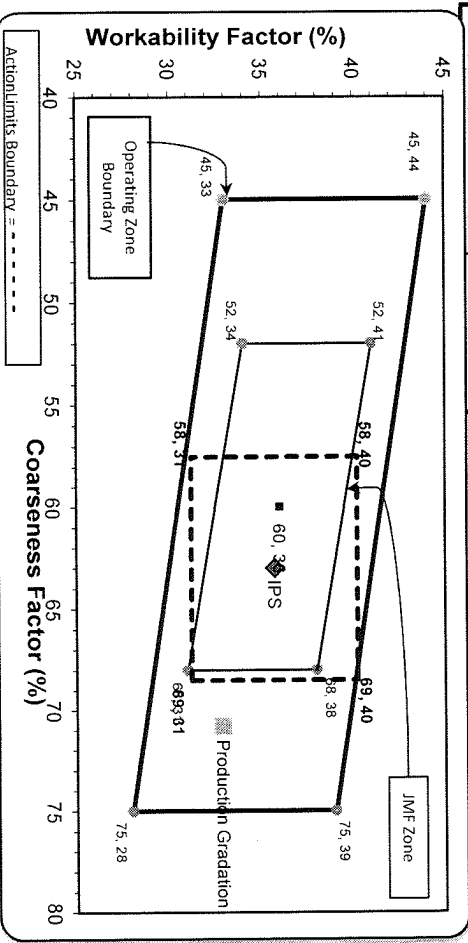
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Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	83.0	100.0	100.0	91.0	9.0	9.0
1/2"	31.3	99.3	100.0	63.4	27.6	36.6
3/8"	12.6	87.8	100.0	52.5	10.9	47.5
#4	2.1	12.2	97.8	40.0	12.5	60.0
#8	1.5	4.4	82.0	32.9	7.1	67.1
#16	1.3	3.1	63.5	25.5	7.4	74.5
#30	1.2	2.7	45.3	18.4	7.1	81.6
#50	1.2	2.5	21.9	9.3	9.1	90.7
#100	1.1	2.4	6.8	3.4	5.9	96.6
LBW	0.9	2.3	1.1	1.1	2.3	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 4% for the 3/4" sieve when
 a 1.5" max size (nom. Max. 1.0") aggregate is used.

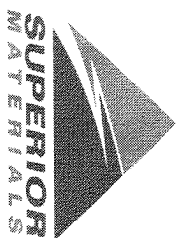
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **71** Workability Factor: **33**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	63	36	0.0	0.0
1.5"			0.0	0.0
1"			0.8	0.8
3/4"			8.3	9.1
1/2"			19.6	28.7
3/8"			11.8	40.5
#4			15.7	56.2
#8			8.1	64.3
#16			8.7	73.0
#30			8.4	81.4
#50			11.8	93.2
#100			5.4	98.6
LBW			0.8	99.4



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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi
Product 1051-6AA LS
Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
Report Date 08/27/2023

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)	83.0	%	
	1/2" (12.5mm)	31.3	%	30-60
	3/8" (9.5mm)	12.6	%	
	#4 (4.75mm)	2.1	%	0-8
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	0.96	%	
	Wash Loss (#200/75um)	0.9	%	0-2
	Total Moisture	3.27	%	



Plant S102-Superior Novi
 Product 1067-26A Mod LS
 Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
 Report Date 08/27/2023

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)	99.3	%	95-100
	3/8" (9.5mm)	87.8	%	60-95
	#4 (4.75mm)	12.2	%	5-30
	#8 (2.36mm)	4.4	%	0-12
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	2.78	%	



Plant S102-Superior Novi
Product 1022-2NS GR
Period: 08/20/2023 - 08/26/2023

Name/Title Doug Storey / QC Technician
Report Date 08/27/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.8	%	95-100
	#8 (2.36mm)	82.0	%	65-95
	#16 (1.18mm)	63.5	%	35-75
	#30 (.6mm)	45.3	%	20-55
	#50 (.3mm)	21.9	%	10-30
	#100 (.15mm)	6.8	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.83		2.6-3
	Wash Loss (#200/75µm)	1.1	%	0-3
	Total Moisture	2.95	%	