Aggregate Optimization Chart

Production Gradation Report

PLANT #: 20

Sample Date: 7/3/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	50.8
26A	71-47	Presque Isle	250	1.53	2.62	8.2
2NS	63-92	Grange Hall	1250	7.56	2.65	41.0
		Total Wt	**3050**	**18.57**		100.0

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

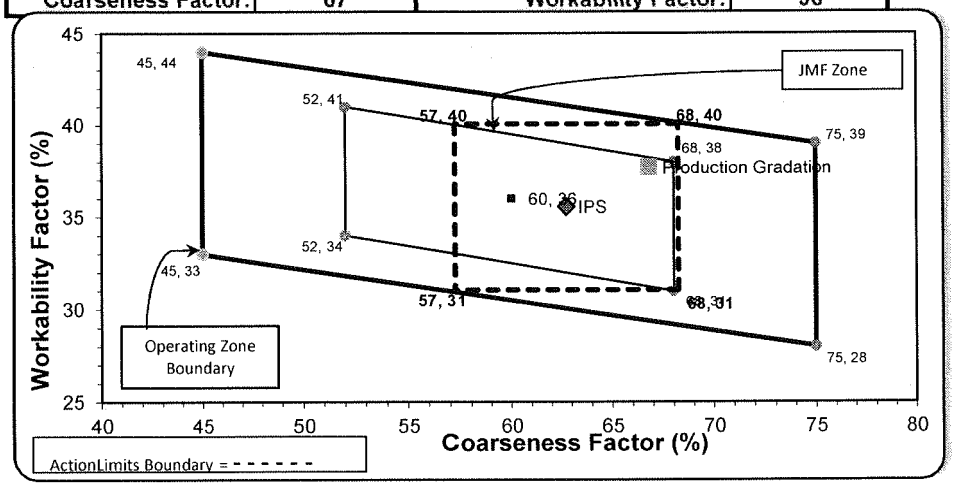
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.4	100.0	100.0	98.7	1.3	1.3
3/4"	75.5	100.0	100.0	87.5	11.1	12.5
1/2"	36.2	95.8	100.0	67.2	20.3	32.8
3/8"	20.3	86.4	100.0	58.4	8.9	41.6
#4	4.9	24.0	98.2	44.7	13.7	55.3
#8	3.0	7.8	86.7	37.7	7.0	62.3
#16	2.6	4.3	73.2	31.7	6.0	68.3
#30	2.5	3.5	55.1	24.1	7.5	75.9
#50	2.4	3.1	22.8	10.8	13.3	89.2
#100	2.2	2.9	4.4	3.2	7.7	96.8
LBW	1.7	2.5	0.6	1.3	1.8	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.

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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	67	Workability Factor:	38



Intial Production Sample (IPS)

Coarseness Factor:	63
Workability Factor:	36

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"	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: 07/02/2023 - 07/08/2023

Name/Title Doug Storey / QC Technician

Report Date 07/07/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.4	%	95-100
	3/4" (19mm)	75.5	%	
	1/2" (12.5mm)	36.2	%	30-60
	3/8" (9.5mm)	20.3	%	
	#4 (4.75mm)	4.9	%	0-8
	#8 (2.36mm)	3.0	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.94	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	3.03	%	

Plant S20-Superior Flint

Product 1067-26A Mod LS

Period: 07/02/2023 - 07/08/2023

Name/Title Doug Storey / QC Technician

Report Date 07/07/2023

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)	95.8	%	95-100
	3/8" (9.5mm)	86.4	%	60-95
	#4 (4.75mm)	24.0	%	5-30
	#8 (2.36mm)	7.8	%	0-12
	#16 (1.18mm)	4.3	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.42	%	

Plant S20-Superior Flint

Product 1022-2NS GR

Period: 07/02/2023 - 07/08/2023

Name/Title Doug Storey / QC Technician

Report Date 07/07/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.2	%	95-100
	#8 (2.36mm)	86.7	%	65-95
	#16 (1.18mm)	73.2	%	35-75
	#30 (.6mm)	55.1	%	20-55
	#50 (.3mm)	22.8	%	10-30
	#100 (.15mm)	4.4	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.60		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	2.14	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1650	9.83	2.69	53.2
26A	58-003	Stoneco	250	1.49	2.69	8.1
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7
		Total Wt	**3100**	**18.58**		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"	78.9	100.0	100.0	88.8	11.2	11.2
1/2"	35.4	99.4	100.0	65.6	23.2	34.4
3/8"	16.6	89.4	100.0	54.8	10.8	45.2
#4	1.3	12.9	98.3	39.8	15.0	60.2
#8	0.9	4.8	83.2	33.1	6.7	66.9
#16	0.7	3.6	65.4	26.0	7.1	74.0
#30	0.7	3.1	47.0	18.8	7.2	81.2
#50	0.6	2.6	22.2	9.1	9.7	90.9
#100	0.6	2.4	6.6	3.1	6.1	96.9
LBW	0.4	2.3	1.2	0.9	2.2	99.1

*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.

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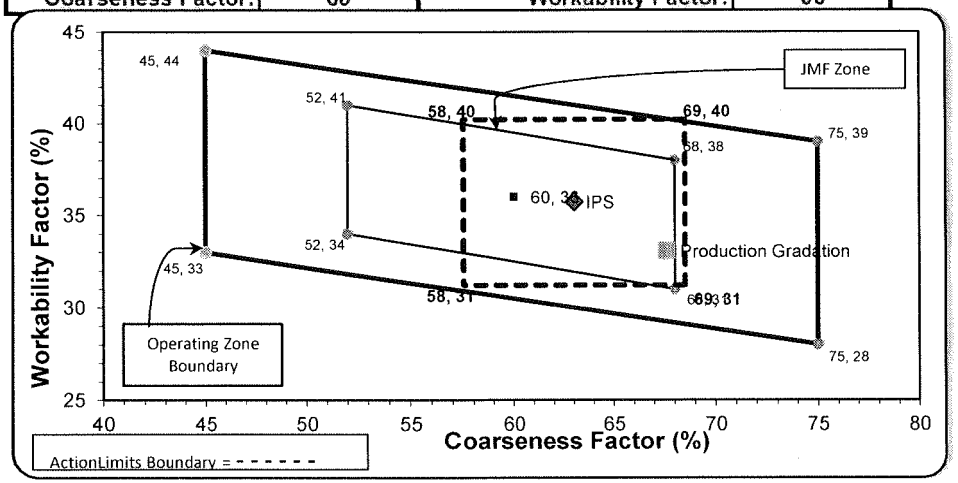
Farmington Hills, MI 48336

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	68	Workability Factor:	33



Intial Production Sample (IPS)

Coarseness Factor:	63
Workability Factor:	36

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

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S102-Superior Novi

Product 1051-6AA LS

Period: 07/02/2023 - 07/08/2023

Name/Title Doug Storey / QC Technician

Report Date 07/07/2023

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)	78.9	%	
	1/2" (12.5mm)	35.4	%	30-60
	3/8" (9.5mm)	16.6	%	
	#4 (4.75mm)	1.3	%	0-8
	#8 (2.36mm)	0.9	%	
	#16 (1.18mm)	0.7	%	
	#30 (.6mm)	0.7	%	
	#50 (.3mm)	0.6	%	
	#100 (.15mm)	0.6	%	
	#200 (75µm)	0.52	%	
	Wash Loss (#200/75um)	0.4	%	0-2
	Total Moisture	3.59	%	

Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 07/02/2023 - 07/08/2023

Name/Title Doug Storey / QC Technician

Report Date 07/07/2023

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)	99.4	%	95-100
	3/8" (9.5mm)	89.4	%	60-95
	#4 (4.75mm)	12.9	%	5-30
	#8 (2.36mm)	4.8	%	0-12
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	3.1	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	3.02	%	

Plant S102-Superior Novi

Product 1022-2NS GR

Period: 07/02/2023 - 07/08/2023

Name/Title Doug Storey / QC Technician

Report Date 07/07/2023

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)	83.2	%	65-95
	#16 (1.18mm)	65.4	%	35-75
	#30 (.6mm)	47.0	%	20-55
	#50 (.3mm)	22.2	%	10-30
	#100 (.15mm)	6.6	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.77		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	4.75	%	