Aggregate Optimization Chart

Production Gradation Report

PLANT #: 12

Contractor: _____

Sample Date: 6/5/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 6/6/2023 through 6/12/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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

<----- 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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	84.2	100.0	100.0	91.7	8.0	8.3
1/2"	44.6	94.7	100.0	70.6	21.2	29.4
3/8"	26.2	83.4	100.0	60.1	10.5	39.9
#4	5.4	26.4	97.0	43.9	16.2	56.1
#8	2.7	9.1	81.6	35.0	8.9	65.0
#16	2.3	5.3	67.4	28.8	6.2	71.2
#30	2.2	4.3	52.5	22.6	6.1	77.4
#50	2.2	3.4	26.3	12.0	10.6	88.0
#100	2.0	2.7	5.2	3.3	8.7	96.7
LBW	1.5	2.3	0.6	1.2	2.1	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.

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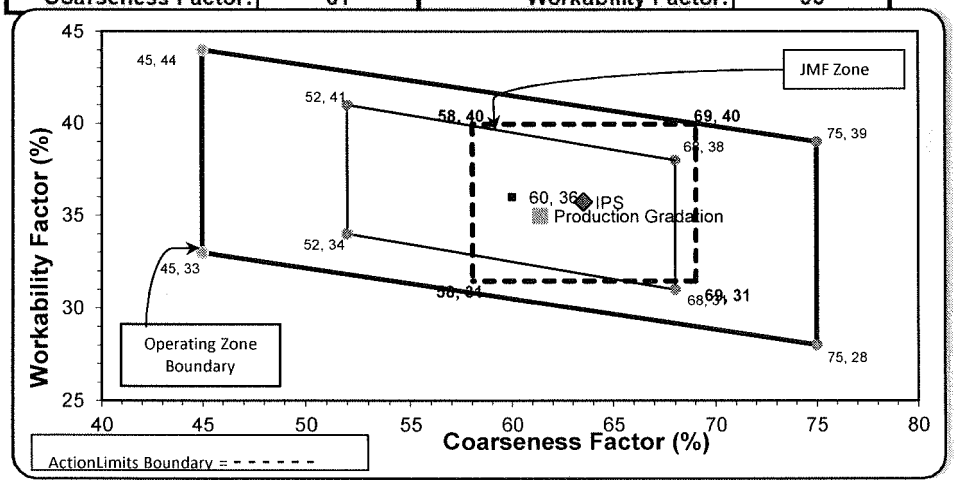
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	61	Workability Factor:	35



Intial Production Sample (IPS)

Coarseness Factor:	64
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"	59.2	12.1	40.8
#4	41.5	17.7	58.5
#8	35.7	5.8	64.3
#16	27.9	7.9	72.1
#30	18.3	9.5	81.7
#50	7.3	11.0	92.7
#100	2.0	5.3	98.0
LBW	0.9	1.1	99.1

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S12-Superior Onsite

Product 1051-6AA LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.4	%	95-100
	3/4" (19mm)	84.2	%	
	1/2" (12.5mm)	44.6	%	30-60
	3/8" (9.5mm)	26.2	%	
	#4 (4.75mm)	5.4	%	0-8
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.75	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	3.77	%	

Plant S12-Superior Onsite

Product 1067-26A Mod LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	94.7	%	95-100
	3/8" (9.5mm)	83.4	%	60-95
	#4 (4.75mm)	26.4	%	5-30
	#8 (2.36mm)	9.1	%	0-12
	#16 (1.18mm)	5.3	%	
	#30 (.6mm)	4.3	%	
	#50 (.3mm)	3.4	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	1.74	%	

Plant S12-Superior Onsite

Product 1022-2NS GR

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	81.6	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	52.5	%	20-55
	#50 (.3mm)	26.3	%	10-30
	#100 (.15mm)	5.2	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.17	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 6/5/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 6/6/2023 through 6/12/2023

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1670	10.21	2.62	54.8
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	95-013	Smelter Bay	1230	7.44	2.65	40.3
		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"	98.6	100.0	100.0	99.2	0.8	0.8
3/4"	83.0	100.0	100.0	90.7	8.5	9.3
1/2"	50.6	95.6	100.0	72.7	18.0	27.3
3/8"	35.3	86.3	100.0	63.9	8.8	36.1
#4	7.4	15.9	96.4	43.7	20.2	56.3
#8	3.4	3.9	84.5	36.1	7.6	63.9
#16	2.8	2.2	69.1	29.5	6.6	70.5
#30	2.7	1.7	48.8	21.2	8.3	78.8
#50	2.5	1.5	23.0	10.7	10.5	89.3
#100	2.4	1.3	6.5	4.0	6.7	96.0
LBW	1.9	1.1	1.0	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.

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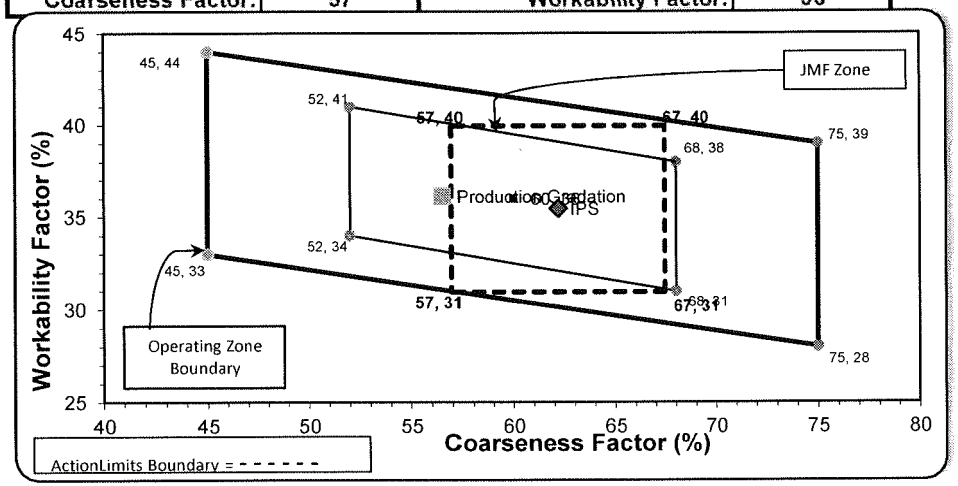
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	57	Workability Factor:	36



Intial Production Sample (IPS)

Coarseness Factor:	62
Workability Factor:	35

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

PREPARED BY:
SM, LLC Technical Service

Approved By:

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
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Plant 958-JMT

Product 1054-6AA LS PI

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.6	%	95-100
	3/4" (19mm)	83.0	%	
	1/2" (12.5mm)	50.6	%	30-60
	3/8" (9.5mm)	35.3	%	
	#4 (4.75mm)	7.4	%	0-8
	#8 (2.36mm)	3.4	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	3.9	%	

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Plant 958-JMT

Product 1067-26A Mod LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	95.6	%	95-100
	3/8" (9.5mm)	86.3	%	60-95
	#4 (4.75mm)	15.9	%	5-30
	#8 (2.36mm)	3.9	%	0-12
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	0.8	%	

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Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	84.5	%	65-95
	#16 (1.18mm)	69.1	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	23.0	%	10-30
	#100 (.15mm)	6.5	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.4	%	