Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 8/8/22

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 8/9/2022 through 8/15/2022

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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

<----- 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"	97.6	100.0	100.0	98.7	1.3	1.3
3/4"	85.4	100.0	100.0	92.2	6.5	7.8
1/2"	49.9	95.9	100.0	73.1	19.1	26.9
3/8"	28.7	84.9	100.0	61.1	12.0	38.9
#4	6.1	14.8	95.5	42.7	18.4	57.3
#8	2.4	3.6	82.3	34.7	8.0	65.3
#16	1.9	2.0	67.1	28.2	6.5	71.8
#30	1.8	1.6	48.8	20.7	7.5	79.3
#50	1.8	1.5	24.7	11.0	9.7	89.0
#100	1.7	1.2	8.0	4.2	6.8	95.8
LBW	1.5	1.1	1.4	1.4	2.8	98.6

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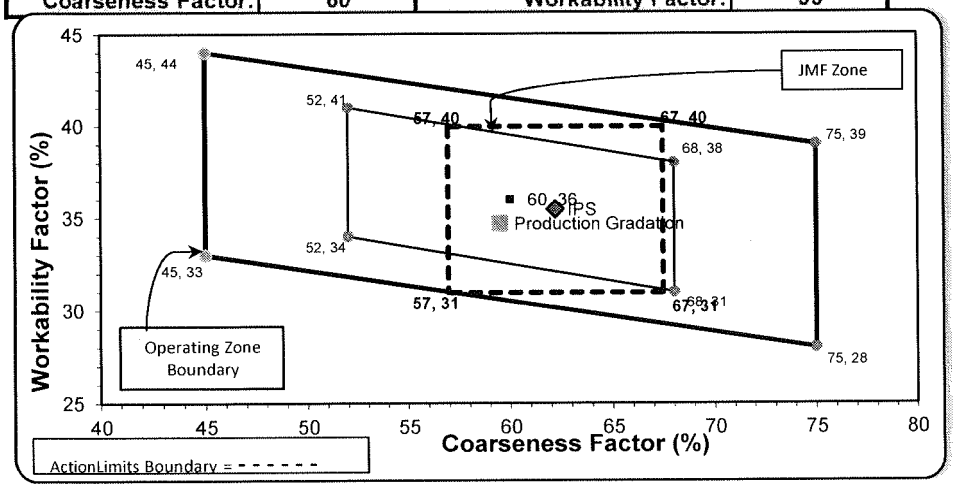
Farmington Hills, MI 48336

*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:	60	Workability Factor:	35



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
(313) 429-2429

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.5	%	95-100
	#8 (2.36mm)	82.3	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	24.7	%	10-30
	#100 (.15mm)	8.0	%	0-10
	#200 (75µm)	2.1	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.5	%	

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Plant 958-JMT

Product 1067-26A Mod LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

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)	84.9	%	60-95
	#4 (4.75mm)	14.8	%	5-30
	#8 (2.36mm)	3.6	%	0-12
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	2.4	%	

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Plant 958-JMT

Product 1054-6AA LS PI

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.6	%	95-100
	3/4" (19mm)	85.4	%	
	1/2" (12.5mm)	49.9	%	30-60
	3/8" (9.5mm)	28.7	%	
	#4 (4.75mm)	6.1	%	0-8
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	2.2	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Contractor: _____

Sample Date: 8/8/22

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 8/9/2022 through 8/15/2022

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	300	1.83	2.62	9.8
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
		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"	98.5	100.0	100.0	99.2	0.8	0.8
3/4"	77.5	100.0	100.0	88.6	10.7	11.4
1/2"	38.5	95.1	100.0	68.3	20.3	31.7
3/8"	19.3	83.7	100.0	57.4	10.9	42.6
#4	3.5	24.1	97.6	42.5	14.8	57.5
#8	2.5	7.3	80.1	33.5	9.0	66.5
#16	2.2	3.6	63.5	26.5	7.0	73.5
#30	2.0	2.8	43.0	18.2	8.2	81.8
#50	1.8	2.5	14.1	6.7	11.5	93.3
#100	1.7	2.2	2.7	2.1	4.6	97.9
LBW	1.4	1.8	0.4	1.0	1.1	99.0

*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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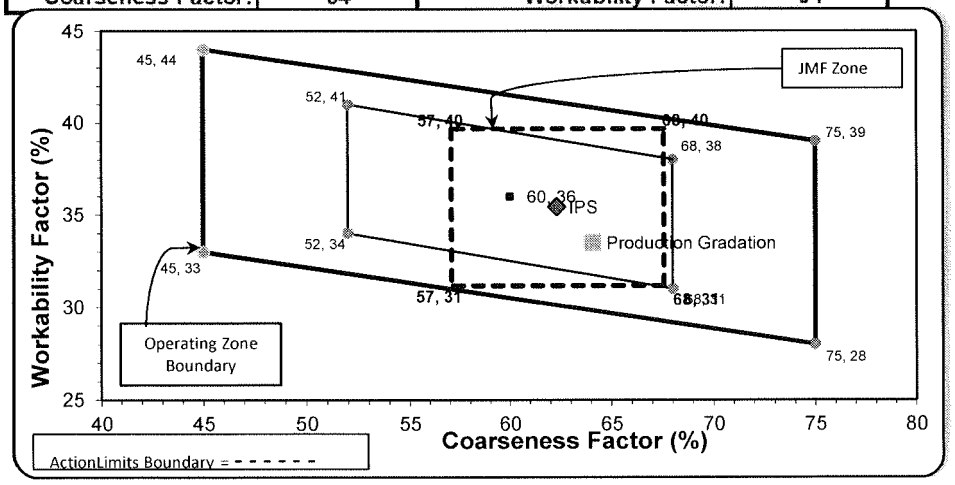
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	64	Workability Factor:	34



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"	99.1	0.9	0.9
3/4"	90.5	8.6	9.5
1/2"	69.8	20.7	30.2
3/8"	59.8	10.0	40.2
#4	42.2	17.6	57.8
#8	35.4	6.7	64.6
#16	28.8	6.7	71.2
#30	21.4	7.4	78.6
#50	8.8	12.6	91.2
#100	1.8	7.0	98.2
LBW	0.7	1.0	99.3

PREPARED BY:
SM, LLC Technical Service

Approved By:

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2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

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)	80.1	%	65-95
	#16 (1.18mm)	63.5	%	35-75
	#30 (.6mm)	43.0	%	20-55
	#50 (.3mm)	14.1	%	10-30
	#100 (.15mm)	2.7	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.99		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3

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Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 08/07/2022 - 08/13/2022

Report Date 08/12/2022

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)	95.1	%	95-100
	3/8" (9.5mm)	83.7	%	60-95
	#4 (4.75mm)	24.1	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3

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Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.5	%	95-100
	3/4" (19mm)	77.5	%	
	1/2" (12.5mm)	38.5	%	30-60
	3/8" (9.5mm)	19.3	%	
	#4 (4.75mm)	3.5	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2