Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Contractor: _____

Sample Date: 4/27/20

Concrete Grade: S2M

Dates Test Represents: 4/28/2020 through 5/4/2020

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	250	1.53	2.62	8.2
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"	97.8	100.0	100.0	98.8	1.2	1.2
3/4"	73.8	100.0	100.0	86.3	12.6	13.7
1/2"	38.9	95.3	100.0	67.6	18.7	32.4
3/8"	23.6	80.0	100.0	58.3	9.3	41.7
#4	5.3	21.8	96.9	42.7	15.6	57.3
#8	2.6	7.3	84.4	35.2	7.5	64.8
#16	2.2	4.2	69.5	28.8	6.3	71.2
#30	2.1	3.7	49.8	21.0	7.8	79.0
#50	2.0	3.5	19.4	9.0	12.0	91.0
#100	1.9	3.3	3.8	2.8	6.2	97.2
LBW	1.3	2.9	0.6	1.2	1.6	98.8

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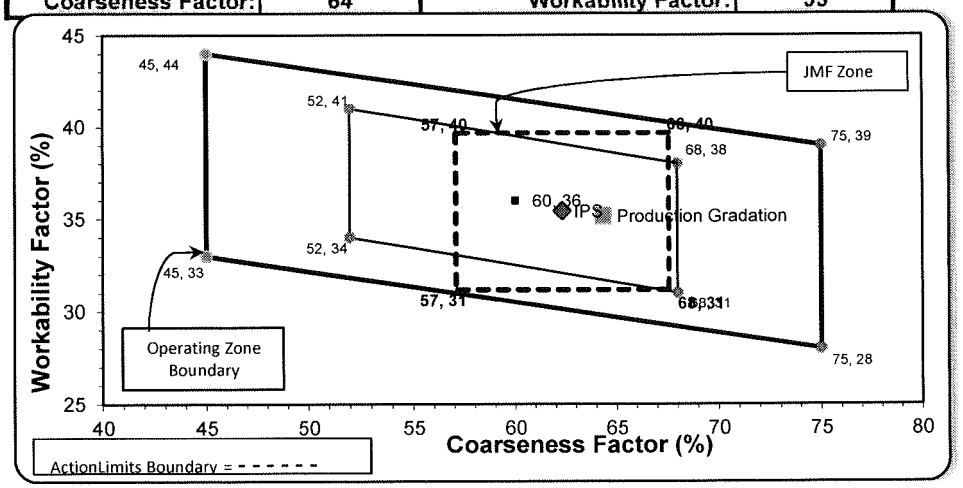
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

*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:	64	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"	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:

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Period: 04/26/2020 - 05/02/2020

Name/Title Doug Storey / QC Technician

Report Date 05/05/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.8	%	95-100
	3/4" (19mm)	73.8	%	
	1/2" (12.5mm)	38.9	%	30-60
	3/8" (9.5mm)	23.6	%	
	#4 (4.75mm)	5.3	%	0-8
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.47	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	3.14	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 04/26/2020 - 05/02/2020

Name/Title Doug Storey / QC Technician

Report Date 05/05/2020

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)	95.3	%	95-100
	3/8" (9.5mm)	80.0	%	60-95
	#4 (4.75mm)	21.8	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	4.2	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.5	%	
	#100 (.15mm)	3.3	%	
	#200 (75µm)	3.0	%	
	Wash Loss (#200/75um)	2.9	%	0-3
	Total Moisture	3.90	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Period: 04/26/2020 - 05/02/2020

Name/Title Doug Storey / QC Technician

Report Date 05/05/2020

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)	84.4	%	65-95
	#16 (1.18mm)	69.5	%	35-75
	#30 (.6mm)	49.8	%	20-55
	#50 (.3mm)	19.4	%	10-30
	#100 (.15mm)	3.8	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.44	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-39

Sample Date: 4/27/20

Concrete Grade: S2M

Contractor: _____

Dates Test Represents: 4/28/2020 through 5/4/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1700	10.40	2.62	55.7
26A	71-47	Presque Isle	150	0.92	2.62	4.9
2NS	63-92	Grange Hall	1200	7.26	2.65	39.3
		Total Wt	**3050**	**18.57**		100.0

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

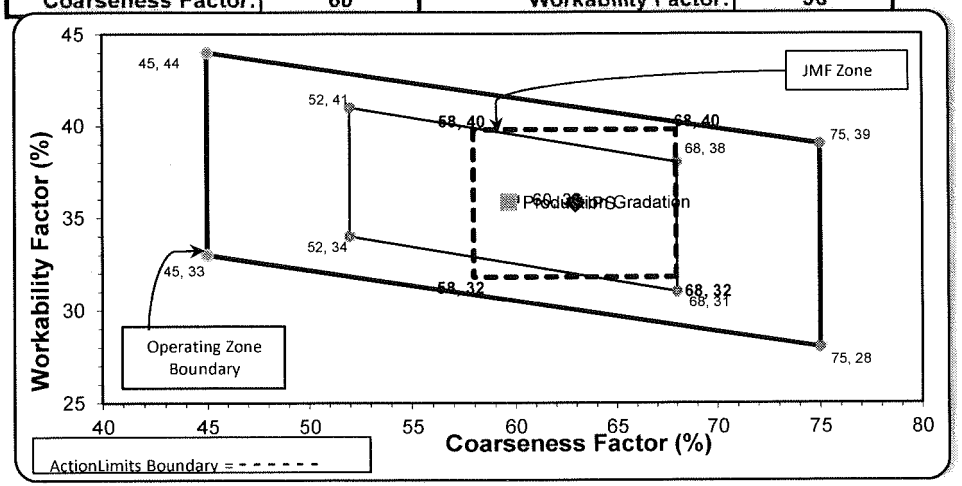
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.7	100.0	100.0	98.7	1.3	1.3
3/4"	84.4	100.0	100.0	91.3	7.4	8.7
1/2"	49.6	97.8	100.0	71.8	19.5	28.2
3/8"	33.0	80.8	100.0	61.7	10.1	38.3
#4	7.8	21.1	97.6	43.8	17.9	56.2
#8	3.3	6.8	85.6	35.9	7.9	64.1
#16	2.7	4.4	70.4	29.4	6.4	70.6
#30	2.5	3.9	50.8	21.6	7.8	78.4
#50	2.4	3.7	21.9	10.1	11.4	89.9
#100	2.3	3.5	4.0	3.0	7.1	97.0
LBW	1.9	3.0	0.9	1.6	1.5	98.4

*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:	60	Workability Factor:	36



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"	89.8	10.2	10.2
1/2"	70.7	19.1	29.3
3/8"	59.6	11.1	40.4
#4	43.2	16.4	56.8
#8	35.8	7.4	64.2
#16	29.2	6.6	70.8
#30	21.4	7.8	78.6
#50	9.8	11.6	90.2
#100	3.7	6.1	96.3
LBW	1.2	2.5	98.8

PREPARED BY:
SM, LLC Technical Service

Approved By:

SUPERIOR MATERIALS

Plant S39-Superior Sterling Heights

Product 1051-6AA LS

Period: 04/26/2020 - 05/02/2020

Name/Title Doug Storey / QC Technician

Report Date 05/05/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.7	%	95-100
	3/4" (19mm)	84.4	%	
	1/2" (12.5mm)	49.6	%	30-60
	3/8" (9.5mm)	33.0	%	
	#4 (4.75mm)	7.8	%	0-8
	#8 (2.36mm)	3.3	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.01	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	4.05	%	

Plant S39-Superior Sterling Heights

Product 1067-26A Mod LS

Period: 04/26/2020 - 05/02/2020

Name/Title Doug Storey / QC Technician

Report Date 05/05/2020

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)	97.8	%	95-100
	3/8" (9.5mm)	80.8	%	60-95
	#4 (4.75mm)	21.1	%	5-30
	#8 (2.36mm)	6.8	%	0-12
	#16 (1.18mm)	4.4	%	
	#30 (.6mm)	3.9	%	
	#50 (.3mm)	3.7	%	
	#100 (.15mm)	3.5	%	
	#200 (75µm)	3.2	%	
	Wash Loss (#200/75um)	3.0	%	0-3
	Total Moisture	4.41	%	

Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Period: 04/26/2020 - 05/02/2020

Name/Title Doug Storey / QC Technician

Report Date 05/05/2020

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)	85.6	%	65-95
	#16 (1.18mm)	70.4	%	35-75
	#30 (.6mm)	50.8	%	20-55
	#50 (.3mm)	21.9	%	10-30
	#100 (.15mm)	4.0	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.29	%	