Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-35

Sample Date: 6/15/20

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 6/16/2020 through 6/22/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.4
26A	58-003	Stoneco	455	2.71	2.69	15.4
2NS	81-093	Burmeister	1100	6.65	2.65	37.2
		Total Wt	**2955**	**17.70**		100.0

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

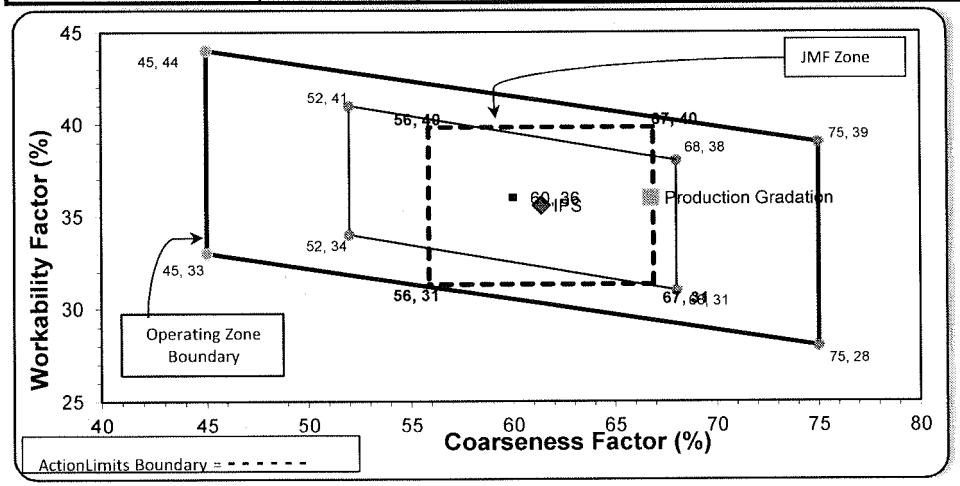
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	69.3	100.0	100.0	85.5	14.5	14.5
1/2"	30.2	99.6	100.0	66.9	18.6	33.1
3/8"	12.7	80.2	100.0	55.6	11.3	44.4
#4	4.1	16.3	98.5	41.1	14.5	58.9
#8	3.2	5.5	83.6	33.5	7.6	66.5
#16	2.8	2.9	66.9	26.7	6.8	73.3
#30	2.6	2.2	49.7	20.1	6.6	79.9
#50	2.3	2.1	21.5	9.4	10.7	90.6
#100	2.1	1.8	5.8	3.4	6.0	96.6
LBW	1.8	1.1	2.2	1.8	1.6	98.2

Superior Materials, LLC
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:	67	Workability Factor:	33	Adjusted WF 36.0



Intial Production Sample (IPS)

Coarseness Factor:	61
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"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S35-Superior Romulus

Product 1051-6AA LS

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

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)	69.3	%	
	1/2" (12.5mm)	30.2	%	30-60
	3/8" (9.5mm)	12.7	%	
	#4 (4.75mm)	4.1	%	0-8
	#8 (2.36mm)	3.2	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.79	%	
	Wash Loss (#200/75um)	1.6	%	0-2
ASTM C566	Total Moisture	2.51	%	

SUPERIOR MATERIALS

Plant S35-Superior Romulus

Product 1067-26A Mod LS

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

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)	99.6	%	95-100
	3/8" (9.5mm)	80.2	%	60-95
	#4 (4.75mm)	16.3	%	5-30
	#8 (2.36mm)	5.5	%	0-12
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	0.9	%	0-3
ASTM C566	Total Moisture	3.57	%	

SUPERIOR MATERIALS

Plant S35-Superior Romulus

Product 1022-2NS GR

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.5	%	95-100
	#8 (2.36mm)	83.6	%	65-95
	#16 (1.18mm)	66.9	%	35-75
	#30 (.6mm)	49.7	%	20-55
	#50 (.3mm)	21.5	%	10-30
	#100 (.15mm)	5.8	%	0-10
	#200 (75µm)	2.2	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	2.2	%	0-3
ASTM C566	Total Moisture	5.46	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 6/15/20

Concrete Grade: DM

Contractor: _____

Dates Test Represents: 6/16/2020 through 6/22/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	350	2.14	2.62	12.0
2NS	63-92	Grange Hall	1100	6.65	2.65	37.9
		Total Wt	**2905**	**17.69**		100.0

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

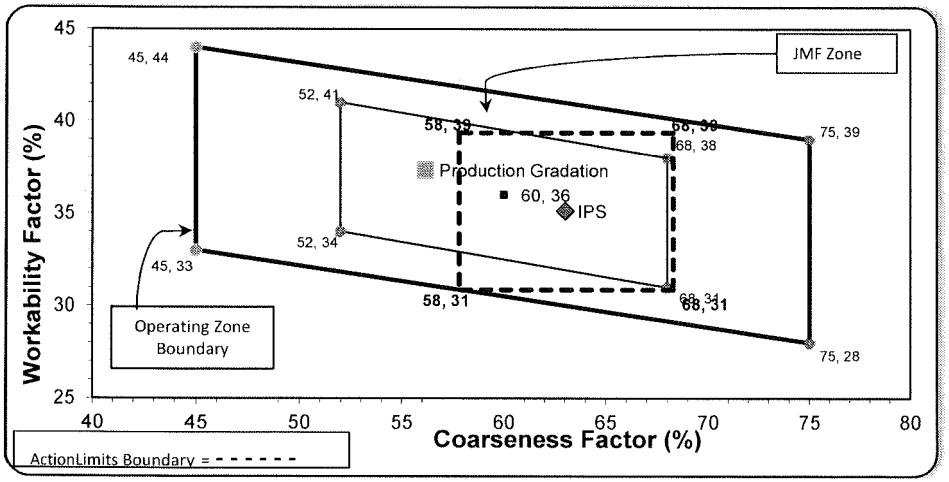
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.6	100.0	100.0	99.3	0.7	0.7
3/4"	79.7	100.0	100.0	89.8	9.5	10.2
1/2"	48.4	96.7	100.0	73.8	16.1	26.2
3/8"	31.1	82.7	100.0	63.4	10.4	36.6
#4	7.9	25.3	97.2	43.8	19.6	56.2
#8	3.1	8.2	85.3	34.8	9.0	65.2
#16	2.2	4.5	70.2	28.2	6.6	71.8
#30	1.9	3.8	49.4	20.1	8.1	79.9
#50	1.7	3.4	19.3	8.6	11.5	91.4
#100	1.5	3.1	3.7	2.5	6.0	97.5
LBW	1.1	2.7	1.8	1.6	1.0	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:	56	Workability Factor:	35	Adjusted WF: 37.3



Intial Production Sample (IPS)

Coarseness Factor:	63
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"	90.3	8.8	9.7
1/2"	69.2	21.1	30.8
3/8"	59.1	10.1	40.9
#4	41.8	17.3	58.2
#8	35.1	6.6	64.9
#16	28.5	6.6	71.5
#30	21.2	7.3	78.8
#50	8.7	12.5	91.3
#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: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.6	%	95-100
	3/4" (19mm)	79.7	%	
	1/2" (12.5mm)	48.4	%	30-60
	3/8" (9.5mm)	31.1	%	
	#4 (4.75mm)	7.9	%	0-8
	#8 (2.36mm)	3.1	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	3.21	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

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)	96.7	%	95-100
	3/8" (9.5mm)	82.7	%	60-95
	#4 (4.75mm)	25.3	%	5-30
	#8 (2.36mm)	8.2	%	0-12
	#16 (1.18mm)	4.5	%	
	#30 (.6mm)	3.8	%	
	#50 (.3mm)	3.4	%	
	#100 (.15mm)	3.1	%	
	#200 (75µm)	2.7	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	2.40	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.2	%	95-100
	#8 (2.36mm)	85.3	%	65-95
	#16 (1.18mm)	70.2	%	35-75
	#30 (.6mm)	49.4	%	20-55
	#50 (.3mm)	19.3	%	10-30
	#100 (.15mm)	3.7	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	2.75	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-39

Sample Date: 6/15/20

Concrete Grade: **DM**

Contractor: _____

Dates Test Represents: 6/16/2020 through 6/22/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft^3	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1705	10.43	2.62	58.7
26A	71-47	Presque Isle	100	0.61	2.62	3.4
2NS	44-051	Krake Willis Rd	1100	6.65	2.65	37.9
		Total Wt	**2905**	**17.69**		100.0

<---- Verify this number is 100%

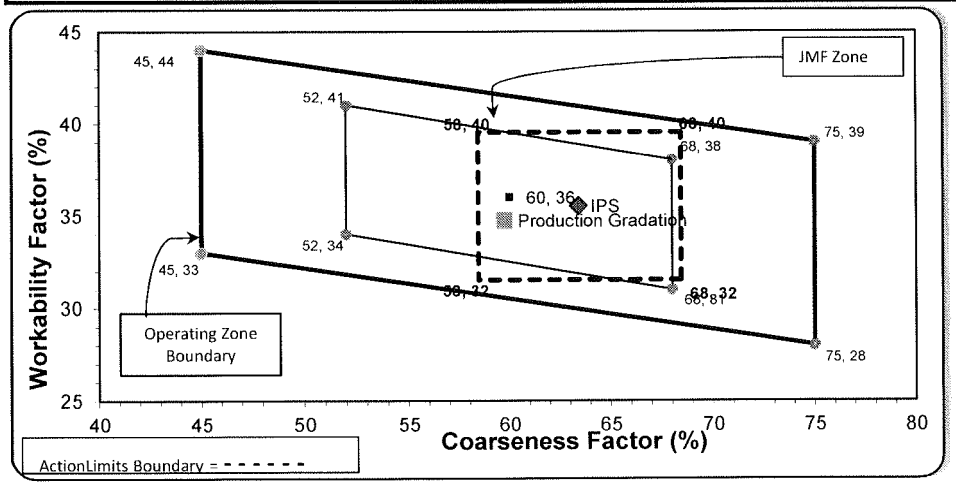
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	98.9	100.0	100.0	99.4	0.6	0.6
3/4"	86.5	100.0	100.0	92.1	7.3	7.9
1/2"	52.1	97.5	100.0	71.8	20.3	28.2
3/8"	31.7	88.4	100.0	59.5	12.3	40.5
#4	5.6	26.2	96.4	40.7	18.8	59.3
#8	2.5	7.3	80.6	32.2	8.5	67.8
#16	2.0	3.4	65.2	26.0	6.3	74.0
#30	1.8	2.7	49.4	19.9	6.1	80.1
#50	1.7	2.4	22.9	9.8	10.1	90.2
#100	1.5	2.1	7.0	3.6	6.1	96.4
LBW	1.2	1.7	1.4	1.3	2.3	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:	60	Workability Factor:	32	Adjusted WF 34.7



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"	89.7	10.3	10.3
1/2"	70.3	19.4	29.7
3/8"	59.1	11.2	40.9
#4	42.8	16.3	57.2
#8	35.5	7.3	64.5
#16	29.0	6.5	71.0
#30	21.2	7.7	78.8
#50	9.8	11.5	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: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.9	%	95-100
	3/4" (19mm)	86.5	%	
	1/2" (12.5mm)	52.1	%	30-60
	3/8" (9.5mm)	31.7	%	
	#4 (4.75mm)	5.6	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.15	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	3.35	%	

SUPERIOR MATERIALS

Plant S39-Superior Sterling Heights

Product 1067-26A Mod LS

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

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)	97.5	%	95-100
	3/8" (9.5mm)	88.4	%	60-95
	#4 (4.75mm)	26.2	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	3.4	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	1.99	%	

Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Period: 06/14/2020 - 06/20/2020

Name/Title Doug Storey / QC Technician

Report Date 06/22/2020

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)	80.6	%	65-95
	#16 (1.18mm)	65.2	%	35-75
	#30 (.6mm)	49.4	%	20-55
	#50 (.3mm)	22.9	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.77	%	