Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 10/12/20

Concrete Grade: S2M

Dates Test Represents: 10/13/2020 through 10/19/2020

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1520	9.30	2.62	49.8
26A	71-47	Presque Isle	300	1.83	2.62	9.8
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"	98.7	100.0	100.0	99.4	0.6	0.6
3/4"	84.4	100.0	100.0	92.2	7.1	7.8
1/2"	47.9	98.7	100.0	73.9	18.3	26.1
3/8"	31.3	87.6	100.0	64.5	9.4	35.5
#4	5.4	18.9	96.9	43.6	20.9	56.4
#8	3.6	4.9	84.6	36.4	7.2	63.6
#16	2.8	2.4	68.7	29.3	7.1	70.7
#30	2.6	2.0	48.7	21.1	8.2	78.9
#50	2.4	1.8	23.5	10.9	10.3	89.1
#100	2.2	1.7	6.1	3.7	7.1	96.3
LBW	1.7	1.4	0.9	1.3	2.4	98.7

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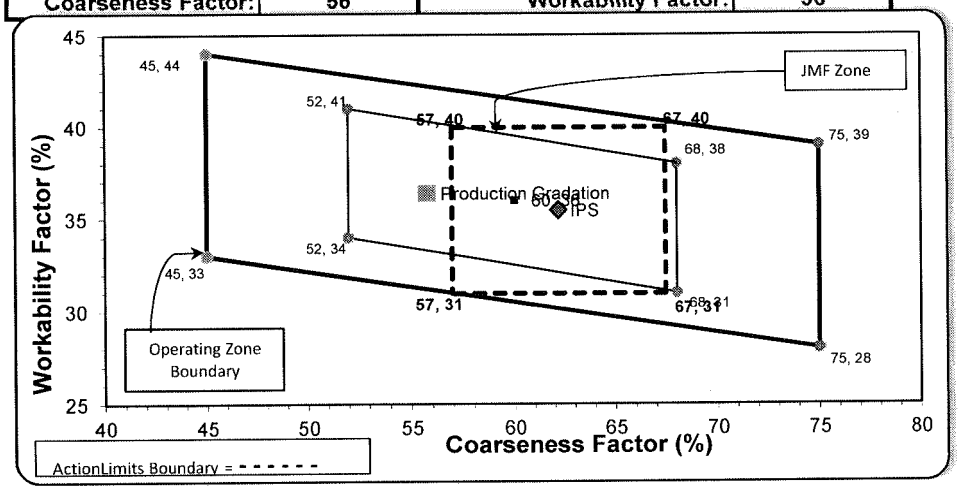
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

*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:	56	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.

8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

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)	84.6	%	65-95
	#16 (1.18mm)	68.7	%	35-75
	#30 (.6mm)	48.7	%	20-55
	#50 (.3mm)	23.5	%	10-30
	#100 (.15mm)	6.1	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.1	%	

Edw. C. Levy Co.

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(313) 429-2429

Plant 958-JMT

Product 1067-26A Mod LS

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

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)	98.7	%	95-100
	3/8" (9.5mm)	87.6	%	60-95
	#4 (4.75mm)	18.9	%	5-30
	#8 (2.36mm)	4.9	%	0-12
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.4	%	

Edw. C. Levy Co.

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Detroit, 48209
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Plant 958-JMT

Product 1054-6AA LS PI

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.7	%	95-100
	3/4" (19mm)	84.4	%	
	1/2" (12.5mm)	47.9	%	30-60
	3/8" (9.5mm)	31.3	%	
	#4 (4.75mm)	5.4	%	0-8
	#8 (2.36mm)	3.6	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	3.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 10/12/20

Concrete Grade: S2M

Contractor: _____

Dates Test Represents: 10/13/2020 through 10/19/2020

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"	97.3	100.0	100.0	98.5	1.5	1.5
3/4"	84.2	100.0	100.0	91.2	7.3	8.8
1/2"	53.1	97.9	100.0	73.8	17.4	26.2
3/8"	32.1	88.9	100.0	61.6	12.1	38.4
#4	5.7	18.7	96.6	42.1	19.5	57.9
#8	2.6	4.8	84.6	35.0	7.1	65.0
#16	2.2	2.2	69.9	28.8	6.1	71.2
#30	2.1	1.8	49.3	20.7	8.2	79.3
#50	2.0	1.6	29.3	12.7	7.9	87.3
#100	1.9	1.5	8.7	4.6	8.2	95.4
LBW	1.5	1.2	1.1	1.3	3.2	98.7

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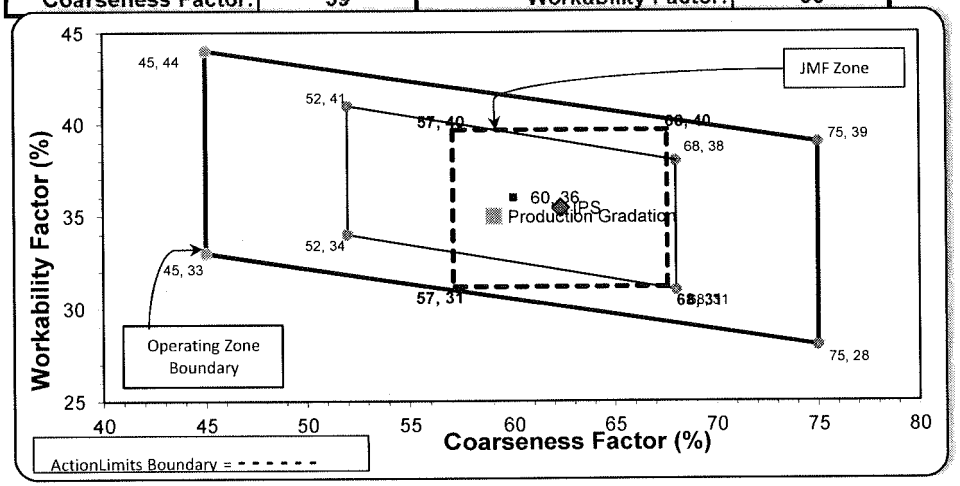
Farmington Hills, MI 48336

*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:	59	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 1022-2NS GR

Period: 10/04/2020 - 10/10/2020

Name/Title Doug Storey / QC Technician

Report Date 10/09/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.4	%	95-100
	#8 (2.36mm)	83.9	%	65-95
	#16 (1.18mm)	68.4	%	35-75
	#30 (.6mm)	47.9	%	20-55
	#50 (.3mm)	18.5	%	10-30
	#100 (.15mm)	6.3	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.70	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 10/04/2020 - 10/10/2020

Name/Title Doug Storey / QC Technician

Report Date 10/09/2020

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)	97.9	%	95-100
	3/8" (9.5mm)	87.2	%	60-95
	#4 (4.75mm)	20.6	%	5-30
	#8 (2.36mm)	5.8	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.16	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Period: 10/04/2020 - 10/10/2020

Name/Title Doug Storey / QC Technician

Report Date 10/09/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.6	%	95-100
	3/4" (19mm)	82.1	%	
	1/2" (12.5mm)	47.1	%	30-60
	3/8" (9.5mm)	27.9	%	
	#4 (4.75mm)	5.0	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	3.13	%	
AASHTO T11	-#200 (75um)	1.51	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-103

Sample Date: 10/12/20

Concrete Grade: S2M

Dates Test Represents: 10/13/2020 through 10/19/2020

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1550	9.23	2.69	50.0
26A	58-003	Stoneco	340	2.03	2.69	11.0
2NS	63-114	Highland	1210	7.32	2.65	39.0
		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"	97.1	100.0	100.0	98.6	1.5	1.5
3/4"	66.1	100.0	100.0	83.1	15.5	17.0
1/2"	32.0	99.6	100.0	66.0	17.1	34.0
3/8"	16.8	90.1	100.0	57.3	8.6	42.7
#4	4.2	19.1	99.0	42.8	14.5	57.2
#8	2.0	6.2	82.6	33.9	8.9	66.1
#16	1.6	3.0	64.8	26.4	7.5	73.6
#30	1.5	2.4	47.1	19.4	7.0	80.6
#50	1.4	2.1	22.0	9.5	9.9	90.5
#100	1.3	2.0	6.0	3.2	6.3	96.8
LBW	1.0	1.8	1.3	1.2	2.0	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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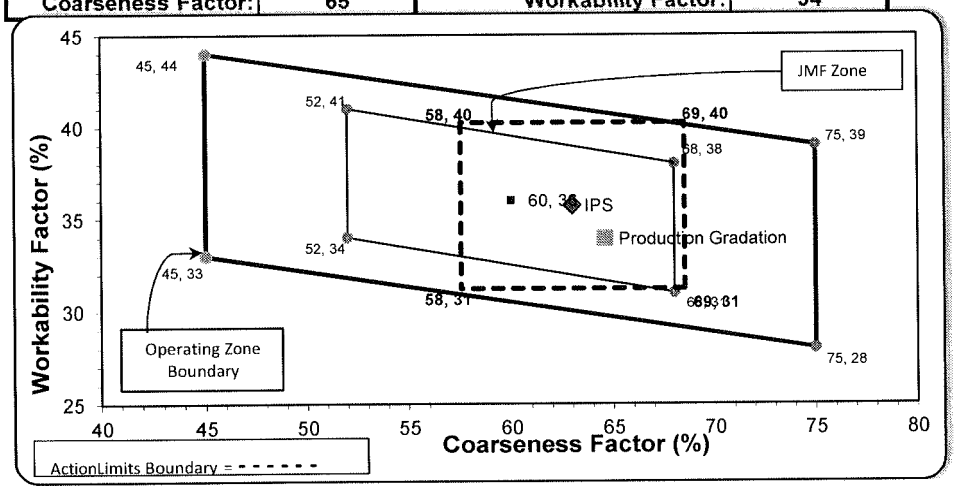
Farmington Hills, MI 48336

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	65	Workability Factor:	34



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 S103-Superior Brighton

Product 1022-2NS GR

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.0	%	95-100
	#8 (2.36mm)	82.6	%	65-95
	#16 (1.18mm)	64.8	%	35-75
	#30 (.6mm)	47.1	%	20-55
	#50 (.3mm)	22.0	%	10-30
	#100 (.15mm)	6.0	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.74	%	

Plant S103-Superior Brighton

Product 1067-26A Mod LS

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

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)	99.6	%	95-100
	3/8" (9.5mm)	90.1	%	60-95
	#4 (4.75mm)	19.1	%	5-30
	#8 (2.36mm)	6.2	%	0-12
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.32	%	

SUPERIOR MATERIALS

Plant S103-Superior Brighton

Product 1051-6AA LS

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.1	%	95-100
	3/4" (19mm)	66.1	%	
	1/2" (12.5mm)	32.0	%	30-60
	3/8" (9.5mm)	16.8	%	
	#4 (4.75mm)	4.2	%	0-8
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.22	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.61	%	