Aggregate Optimization Chart

Production Gradation Report

PLANT #: 12

Sample Date: 6/12/23

Concrete Grade: **S2M, 3500HP**

Contractor: _____

Dates Test Represents: 6/13/2023 through 6/19/2023

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%

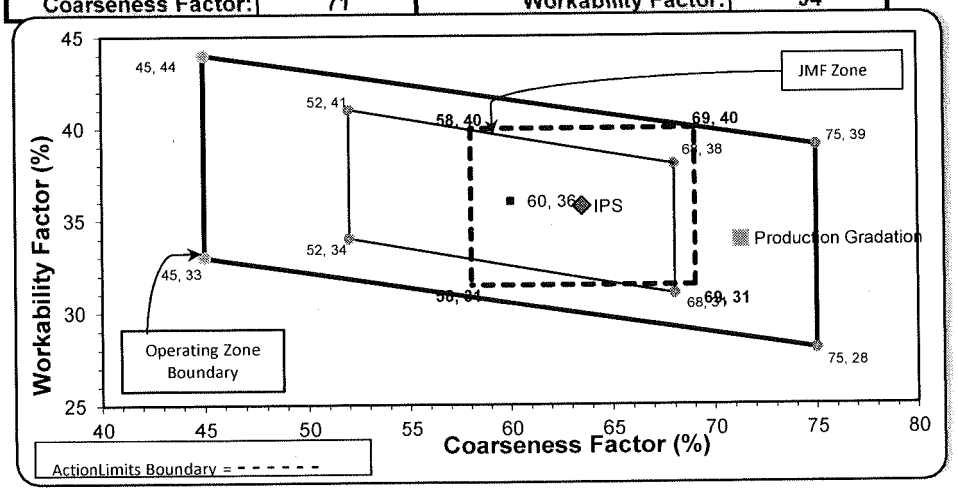
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	97.8	100.0	100.0	98.8	1.2	1.2
3/4"	69.6	100.0	100.0	84.1	14.8	15.9
1/2"	27.3	92.5	100.0	61.3	22.7	38.7
3/8"	12.9	80.2	100.0	52.9	8.4	47.1
#4	3.4	12.6	96.7	41.7	11.2	58.3
#8	2.5	2.6	80.3	33.9	7.8	66.1
#16	2.3	1.6	65.1	27.6	6.3	72.4
#30	2.2	1.4	49.3	21.1	6.4	78.9
#50	2.1	1.4	25.3	11.4	9.7	88.6
#100	1.9	1.3	5.3	3.2	8.2	96.8
LBW	1.5	1.1	0.9	1.2	2.0	98.8

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:	71	Workability Factor:	34



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

Approved By:

PREPARED BY:
SM, LLC Technical Service

SUPERIOR MATERIALS

Plant S12- Onsite Southfield

Product 1051-6AA LS

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

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)	69.6	%	
	1/2" (12.5mm)	27.3	%	30-60
	3/8" (9.5mm)	12.9	%	
	#4 (4.75mm)	3.4	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.66	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	3.49	%	

SUPERIOR MATERIALS

Plant S12- Onsite Southfield

Product 1067-26A Mod LS

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

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)	92.5	%	95-100
	3/8" (9.5mm)	80.2	%	60-95
	#4 (4.75mm)	12.6	%	5-30
	#8 (2.36mm)	2.6	%	0-12
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.03	%	

SUPERIOR MATERIALS

Plant S12- Onsite Southfield

Product 1022-2NS GR

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.7	%	95-100
	#8 (2.36mm)	80.3	%	65-95
	#16 (1.18mm)	65.1	%	35-75
	#30 (.6mm)	49.3	%	20-55
	#50 (.3mm)	25.3	%	10-30
	#100 (.15mm)	5.3	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	4.79	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 6/12/23

Concrete Grade: **S2M, 3500HP**

Contractor: _____

Dates Test Represents: 6/13/2023 through 6/19/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1820	11.13	2.62	59.7
26A	71-47	Presque Isle	0	0.00	2.62	0.0
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"	98.8	100.0	100.0	99.3	0.7	0.7
3/4"	86.1	100.0	100.0	91.7	7.6	8.3
1/2"	45.4	97.2	100.0	67.4	24.3	32.6
3/8"	20.1	88.0	100.0	52.3	15.1	47.7
#4	2.0	21.4	96.6	40.2	12.2	59.8
#8	1.2	4.6	84.8	34.9	5.2	65.1
#16	1.0	2.1	69.4	28.6	6.3	71.4
#30	1.0	1.7	49.5	20.6	8.0	79.4
#50	0.9	1.6	23.7	10.1	10.5	89.9
#100	0.9	1.5	7.0	3.4	6.7	96.6
LBW	0.7	1.3	1.7	1.1	2.3	98.9

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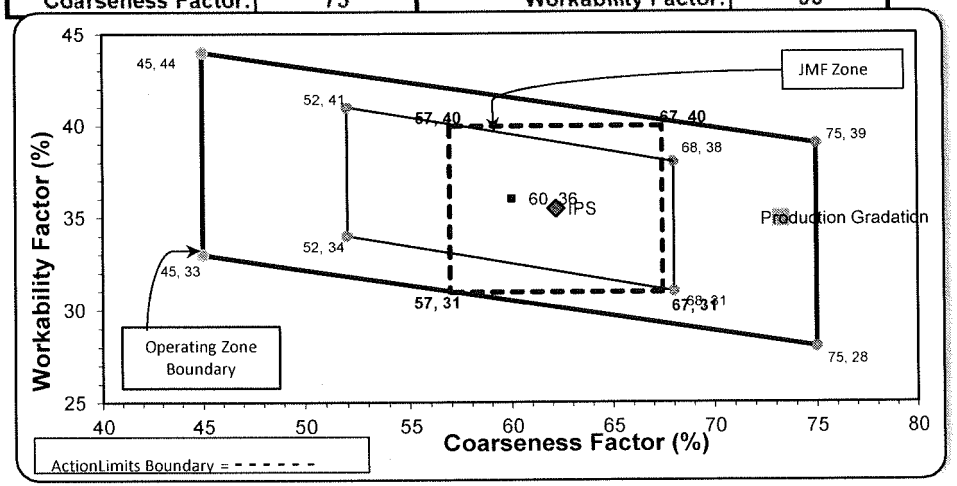
Farmington Hills, MI 48336

*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:	73	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 1054-6AA LS PI

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.8	%	95-100
	3/4" (19mm)	86.1	%	
	1/2" (12.5mm)	45.4	%	30-60
	3/8" (9.5mm)	20.1	%	
	#4 (4.75mm)	2.0	%	0-8
	#8 (2.36mm)	1.2	%	
	#16 (1.18mm)	1.0	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	0.9	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.8	%	
	Wash Loss (#200/75um)	0.7	%	0-2
	Total Moisture	2.5	%	

Edw. C. Levy Co.

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Plant 958-JMT

Product 1067-26A Mod LS

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

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)	97.2	%	95-100
	3/8" (9.5mm)	88.0	%	60-95
	#4 (4.75mm)	21.4	%	5-30
	#8 (2.36mm)	4.6	%	0-12
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.6	%	

Edw. C. Levy Co.

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(313) 429-2429

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.6	%	95-100
	#8 (2.36mm)	84.8	%	65-95
	#16 (1.18mm)	69.4	%	35-75
	#30 (.6mm)	49.5	%	20-55
	#50 (.3mm)	23.7	%	10-30
	#100 (.15mm)	7.0	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	4.2	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Sample Date: 6/12/23

Concrete Grade: **S2M, 3500HP**

Contractor: _____

Dates Test Represents: 6/13/2023 through 6/19/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1725	10.28	2.69	55.6
26A	58-003	Stoneco	175	1.04	2.69	5.6
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.7
		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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	74.9	100.0	100.0	86.0	13.6	14.0
1/2"	32.2	99.9	100.0	62.3	23.8	37.7
3/8"	16.8	91.9	100.0	53.2	9.0	46.8
#4	3.4	14.1	98.4	40.8	12.5	59.2
#8	1.8	5.1	84.8	34.1	6.7	65.9
#16	1.5	4.0	68.5	27.6	6.5	72.4
#30	1.4	3.4	50.6	20.6	7.0	79.4
#50	1.2	3.1	25.7	10.8	9.8	89.2
#100	1.2	3.0	7.8	3.9	6.9	96.1
LBW	1.0	2.8	1.6	1.3	2.5	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.

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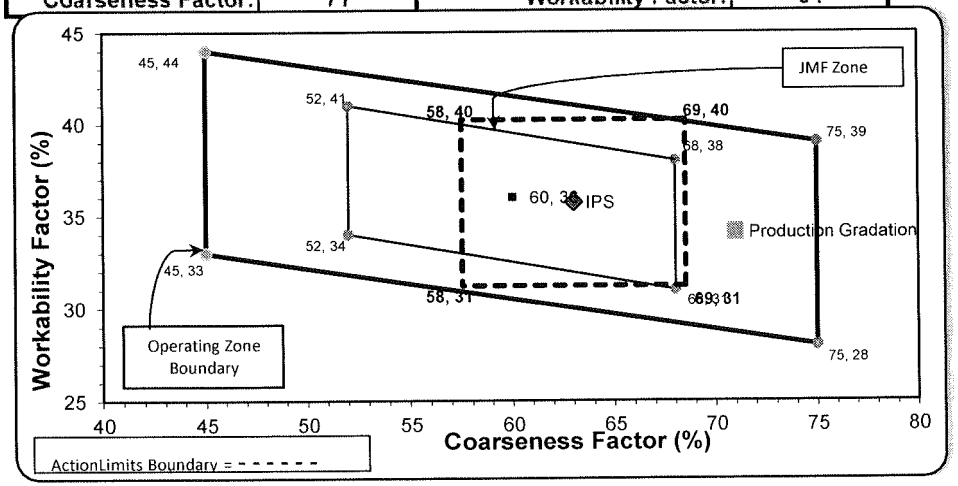
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	71	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 S102-Superior Novi

Product 1051-6AA LS

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

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)	74.9	%	
	1/2" (12.5mm)	32.2	%	30-60
	3/8" (9.5mm)	16.8	%	
	#4 (4.75mm)	3.4	%	0-8
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.12	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	3.55	%	

Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

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)	99.9	%	95-100
	3/8" (9.5mm)	91.9	%	60-95
	#4 (4.75mm)	14.1	%	5-30
	#8 (2.36mm)	5.1	%	0-12
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.8	%	0-3
	Total Moisture	3.09	%	

Plant S102-Superior Novi

Product 1022-2NS GR

Period: 06/11/2023 - 06/17/2023

Name/Title Doug Storey / QC Technician

Report Date 06/17/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.4	%	95-100
	#8 (2.36mm)	84.8	%	65-95
	#16 (1.18mm)	68.5	%	35-75
	#30 (.6mm)	50.6	%	20-55
	#50 (.3mm)	25.7	%	10-30
	#100 (.15mm)	7.8	%	0-10
	#200 (75µm)	2.1	%	
	FM	2.64		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.35	%	