Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 6/5/23

Dates Test Represents: 6/6/2023 through 6/12/2023

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1605	9.82	2.62	55.2
26A	71-47	Presque Isle	150	0.92	2.62	5.2
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	**2905**	**17.69**		100.0

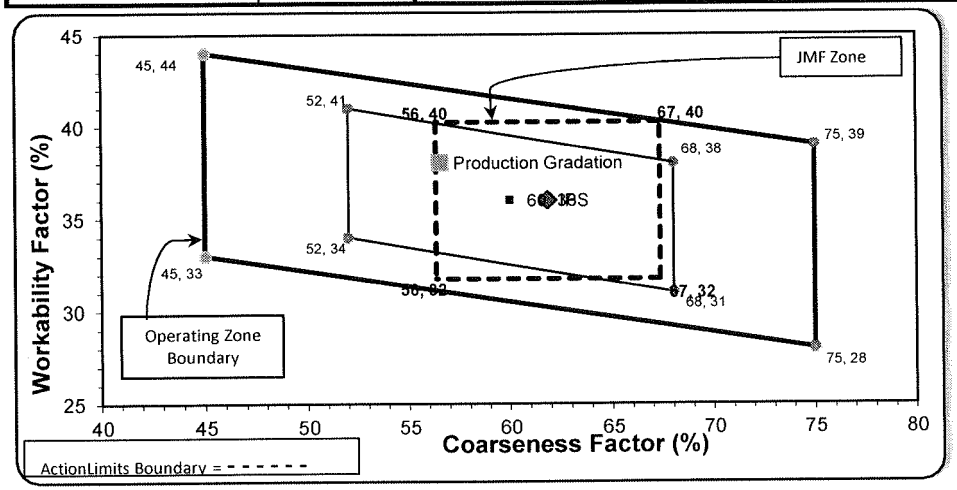
<----- Verify this number is 100%

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	99.2	0.8	0.8
3/4"	83.0	100.0	100.0	90.6	8.6	9.4
1/2"	50.6	95.6	100.0	72.5	18.1	27.5
3/8"	35.3	86.3	100.0	63.5	8.9	36.5
#4	7.4	15.9	96.4	43.1	20.5	56.9
#8	3.4	3.9	84.5	35.5	7.5	64.5
#16	2.8	2.2	69.1	29.0	6.5	71.0
#30	2.7	1.7	48.8	20.9	8.1	79.1
#50	2.5	1.5	23.0	10.6	10.3	89.4
#100	2.4	1.3	6.5	4.0	6.6	96.0
LBW	1.9	1.1	1.0	1.5	2.5	98.5

*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:	57	Workability Factor:	36	Adjusted WF 38.0



Intial Production Sample (IPS)

Coarseness Factor:	62
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"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

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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: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.6	%	95-100
	3/4" (19mm)	83.0	%	
	1/2" (12.5mm)	50.6	%	30-60
	3/8" (9.5mm)	35.3	%	
	#4 (4.75mm)	7.4	%	0-8
	#8 (2.36mm)	3.4	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	3.9	%	

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Plant 958-JMT

Product 1067-26A Mod LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	95.6	%	95-100
	3/8" (9.5mm)	86.3	%	60-95
	#4 (4.75mm)	15.9	%	5-30
	#8 (2.36mm)	3.9	%	0-12
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	0.8	%	

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Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	84.5	%	65-95
	#16 (1.18mm)	69.1	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	23.0	%	10-30
	#100 (.15mm)	6.5	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Contractor: _____

Sample Date: 6/5/23

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 6/6/2023 through 6/12/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.2
26A	58-003	Stoneco	200	1.19	2.69	6.8
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	**2950**	**17.68**		100.0

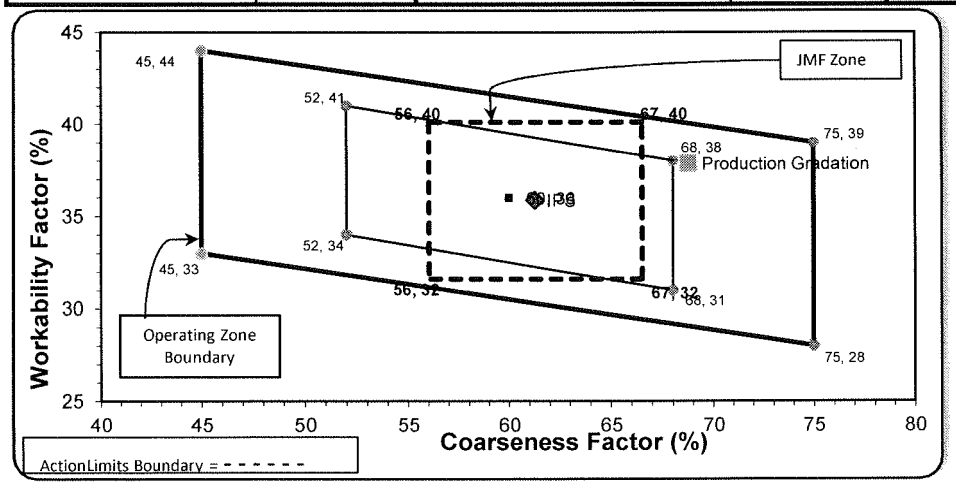
<----- Verify this number is 100%

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"	96.3	100.0	100.0	98.0	2.0	2.0
3/4"	72.3	100.0	100.0	85.0	13.0	15.0
1/2"	33.8	100.0	100.0	64.1	20.9	35.9
3/8"	19.0	92.3	100.0	55.5	8.5	44.5
#4	3.5	18.5	99.7	42.0	13.5	58.0
#8	2.1	6.7	86.6	35.4	6.7	64.6
#16	1.7	4.3	69.7	28.4	7.0	71.6
#30	1.6	3.5	50.9	20.9	7.4	79.1
#50	1.5	3.1	25.0	10.8	10.2	89.2
#100	1.4	3.0	7.8	4.0	6.8	96.0
LBW	1.2	2.8	2.0	1.6	2.4	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.

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	69	Workability Factor:	35	Adjusted WF	37.9



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"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

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PREPARED BY:
SM, LLC Technical Service

Approved By:

SUPERIOR MATERIALS

Plant S102-Superior Novi

Product 1051-6AA LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	96.3	%	95-100
	3/4" (19mm)	72.3	%	
	1/2" (12.5mm)	33.8	%	30-60
	3/8" (9.5mm)	19.0	%	
	#4 (4.75mm)	3.5	%	0-8
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.34	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	3.13	%	

Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	100.0	%	95-100
	3/8" (9.5mm)	92.3	%	60-95
	#4 (4.75mm)	18.5	%	5-30
	#8 (2.36mm)	6.7	%	0-12
	#16 (1.18mm)	4.3	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.9	%	
	Wash Loss (#200/75um)	2.8	%	0-3
	Total Moisture	1.94	%	

Plant S102-Superior Novi

Product 1022-2NS GR

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.7	%	95-100
	#8 (2.36mm)	86.6	%	65-95
	#16 (1.18mm)	69.7	%	35-75
	#30 (.6mm)	50.9	%	20-55
	#50 (.3mm)	25.0	%	10-30
	#100 (.15mm)	7.8	%	0-10
	#200 (75µm)	2.3	%	
	FM	2.60		2.6-3
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.46	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-103

Contractor: _____

Sample Date: 6/5/23

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 6/6/2023 through 6/12/2023

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1600	9.53	2.69	54.2
26A	58-003	Stoneco	200	1.19	2.69	6.8
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	**2950**	**17.68**		100.0

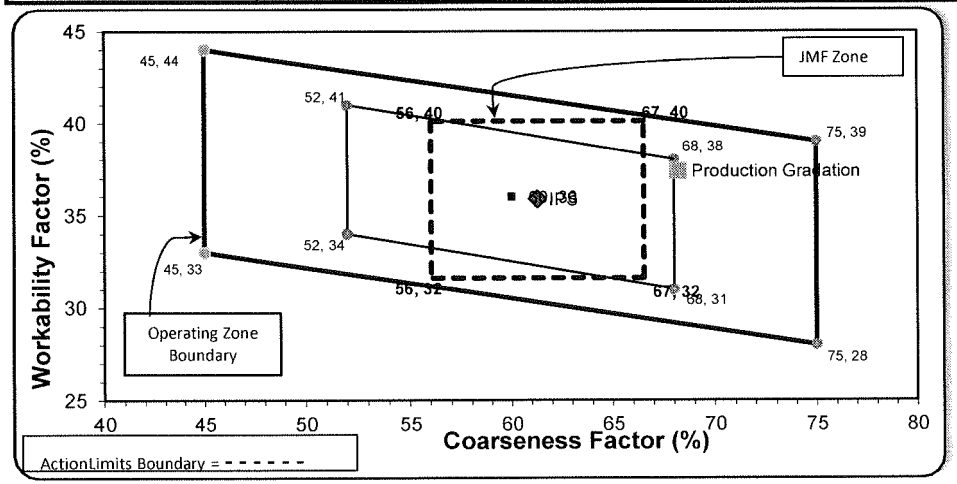
<----- Verify this number is 100%

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	99.3	0.7	0.7
3/4"	75.7	100.0	100.0	86.8	12.5	13.2
1/2"	40.6	98.9	100.0	67.7	19.1	32.3
3/8"	19.7	87.5	100.0	55.6	12.1	44.4
#4	2.4	14.0	99.2	40.9	14.7	59.1
#8	1.5	6.5	86.3	34.9	6.0	65.1
#16	1.2	4.8	69.8	28.2	6.7	71.8
#30	1.1	4.0	51.4	20.9	7.3	79.1
#50	1.1	3.4	25.5	10.8	10.1	89.2
#100	1.0	3.0	7.7	3.7	7.0	96.3
LBW	0.8	2.8	1.8	1.3	2.4	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.

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	68	Workability Factor:	35	Adjusted WF	37.4



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"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

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PREPARED BY:
SM, LLC Technical Service

Approved BY:

Plant S103-Superior Brighton

Product 1051-6AA LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.7	%	95-100
	3/4" (19mm)	75.7	%	
	1/2" (12.5mm)	40.6	%	30-60
	3/8" (9.5mm)	19.7	%	
	#4 (4.75mm)	2.4	%	0-8
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.2	%	
	#30 (.6mm)	1.1	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	0.89	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	3.54	%	

Plant S103-Superior Brighton

Product 1067-26A Mod LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	98.9	%	95-100
	3/8" (9.5mm)	87.5	%	60-95
	#4 (4.75mm)	14.0	%	5-30
	#8 (2.36mm)	6.5	%	0-12
	#16 (1.18mm)	4.8	%	
	#30 (.6mm)	4.0	%	
	#50 (.3mm)	3.4	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.8	%	0-3
	Total Moisture	2.42	%	

Plant S103-Superior Brighton

Product 1022-2NS GR

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.2	%	95-100
	#8 (2.36mm)	86.3	%	65-95
	#16 (1.18mm)	69.8	%	35-75
	#30 (.6mm)	51.4	%	20-55
	#50 (.3mm)	25.5	%	10-30
	#100 (.15mm)	7.7	%	0-10
	#200 (75µm)	2.1	%	
	FM	2.60		2.6-3
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.40	%	