Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 8/8/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/9/2022 through 8/15/2022

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1555	9.51	2.62	53.5
26A	71-47	Presque Isle	200	1.22	2.62	6.9
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	**2905**	**17.69**		100.0

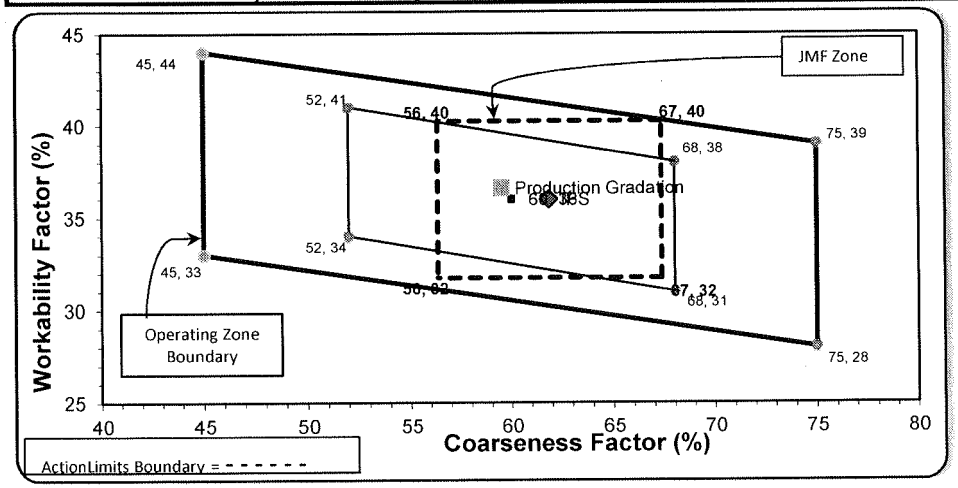
<----- Verify this number is 100%

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"	97.6	100.0	100.0	98.7	1.3	1.3
3/4"	85.4	100.0	100.0	92.2	6.5	7.8
1/2"	49.9	95.9	100.0	72.9	19.3	27.1
3/8"	28.7	84.9	100.0	60.8	12.1	39.2
#4	6.1	14.8	95.5	42.1	18.7	57.9
#8	2.4	3.6	82.3	34.1	8.0	65.9
#16	1.9	2.0	67.1	27.7	6.4	72.3
#30	1.8	1.6	48.8	20.4	7.3	79.6
#50	1.8	1.5	24.7	10.8	9.5	89.2
#100	1.7	1.2	8.0	4.2	6.7	95.8
LBW	1.5	1.1	1.4	1.4	2.7	98.6

*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:	60	Workability Factor:	34	Adjusted WF 36.6



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 1022-2NS GR - Smelter Bay

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.5	%	95-100
	#8 (2.36mm)	82.3	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	24.7	%	10-30
	#100 (.15mm)	8.0	%	0-10
	#200 (75µm)	2.1	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.5	%	

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Plant 958-JMT

Product 1067-26A Mod LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

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)	95.9	%	95-100
	3/8" (9.5mm)	84.9	%	60-95
	#4 (4.75mm)	14.8	%	5-30
	#8 (2.36mm)	3.6	%	0-12
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	2.4	%	

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Plant 958-JMT

Product 1054-6AA LS PI

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	97.6	%	95-100
	3/4" (19mm)	85.4	%	
	1/2" (12.5mm)	49.9	%	30-60
	3/8" (9.5mm)	28.7	%	
	#4 (4.75mm)	6.1	%	0-8
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	2.2	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Contractor: _____

Sample Date: 8/8/22

Concrete Grade: DM, 4500HP

Dates Test Represents: 8/9/2022 through 8/15/2022

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1505	9.21	2.62	51.8
26A	71-47	Presque Isle	300	1.83	2.62	10.3
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"	98.5	100.0	100.0	99.2	0.8	0.8
3/4"	77.5	100.0	100.0	88.3	10.9	11.7
1/2"	38.5	95.1	100.0	67.6	20.7	32.4
3/8"	19.3	83.7	100.0	56.5	11.1	43.5
#4	3.5	24.1	97.6	41.3	15.2	58.7
#8	2.5	7.3	80.1	32.4	8.9	67.6
#16	2.2	3.6	63.5	25.6	6.8	74.4
#30	2.0	2.8	43.0	17.6	7.9	82.4
#50	1.8	2.5	14.1	6.5	11.1	93.5
#100	1.7	2.2	2.7	2.1	4.4	97.9
LBW	1.4	1.8	0.4	1.1	1.1	98.9

*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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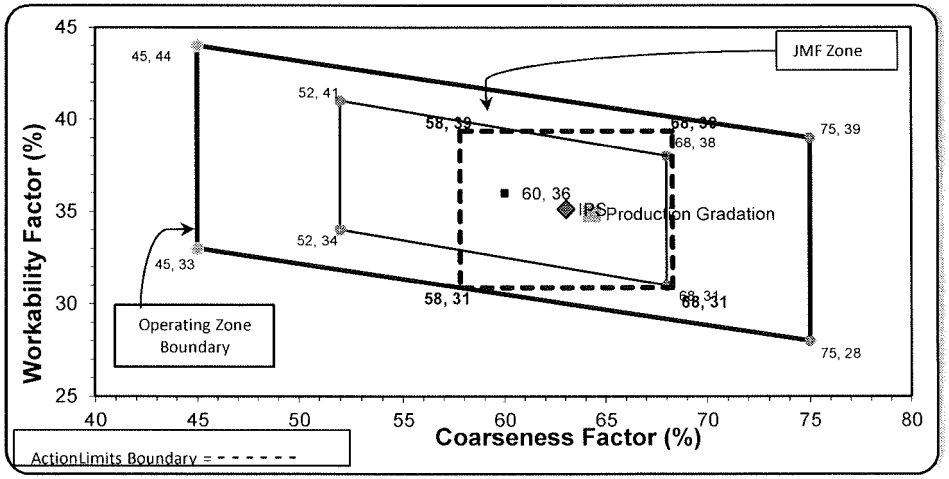
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	64	Workability Factor:	32	Adjusted WF 34.9



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:

Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 08/07/2022 - 08/13/2022

Report Date 08/12/2022

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)	80.1	%	65-95
	#16 (1.18mm)	63.5	%	35-75
	#30 (.6mm)	43.0	%	20-55
	#50 (.3mm)	14.1	%	10-30
	#100 (.15mm)	2.7	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.99		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3

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2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

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)	95.1	%	95-100
	3/8" (9.5mm)	83.7	%	60-95
	#4 (4.75mm)	24.1	%	5-30
	#8 (2.36mm)	7.3	%	0-12
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3

Superior Auburn Hills
2470 Auburn Road
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Plant S36-Superior Auburn Hills

Product 1051-6AA LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

Procedure	Sieve/Test	Result	Unit	6AA LS
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	98.5	%	95-100
	3/4" (19mm)	77.5	%	
	1/2" (12.5mm)	38.5	%	30-60
	3/8" (9.5mm)	19.3	%	
	#4 (4.75mm)	3.5	%	0-8
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-103

Contractor: _____

Sample Date: 8/8/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/9/2022 through 8/15/2022

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1400	8.34	2.69	47.5
26A	58-003	Stoneco	400	2.38	2.69	13.6
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
		Total Wt	**2950**	**17.68**		100.0

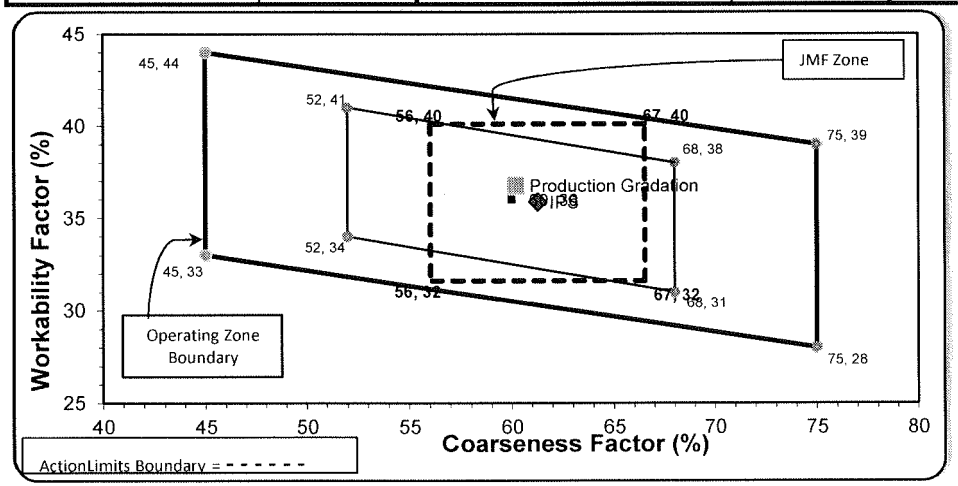
<----- Verify this number is 100%

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"	100.0	100.0	100.0	100.0	0.0	0.0
3/4"	81.7	100.0	100.0	91.3	8.7	8.7
1/2"	37.1	100.0	100.0	70.1	21.2	29.9
3/8"	18.2	94.4	100.0	60.4	9.7	39.6
#4	4.6	29.5	99.3	44.9	15.5	55.1
#8	2.2	10.1	81.7	34.3	10.6	65.7
#16	1.7	4.4	63.7	26.2	8.0	73.8
#30	1.5	2.9	45.6	18.9	7.4	81.1
#50	1.3	2.6	20.8	9.1	9.8	90.9
#100	1.2	2.5	5.4	3.0	6.1	97.0
LBW	1.0	2.2	1.1	1.2	1.8	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.

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	60	Workability Factor:	34	Adjusted WF 36.8



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 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 08/07/2022 - 08/13/2022

Report Date 08/13/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.3	%	95-100
	#8 (2.36mm)	81.7	%	65-95
	#16 (1.18mm)	63.7	%	35-75
	#30 (.6mm)	45.6	%	20-55
	#50 (.3mm)	20.8	%	10-30
	#100 (.15mm)	5.4	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.84		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	4.13	%	

Plant S103-Superior Brighton

Product 1067-26A Mod LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

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)	94.4	%	60-95
	#4 (4.75mm)	29.5	%	5-30
	#8 (2.36mm)	10.1	%	0-12
	#16 (1.18mm)	4.4	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	3.50	%	

Plant S103-Superior Brighton

Product 1051-6AA LS

Period: 08/07/2022 - 08/13/2022

Name/Title Doug Storey / QC Technician

Report Date 08/12/2022

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)	81.7	%	
	1/2" (12.5mm)	37.1	%	30-60
	3/8" (9.5mm)	18.2	%	
	#4 (4.75mm)	4.6	%	0-8
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.3	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.10	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.20	%	