Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Contractor: _____

Sample Date: 10/12/20

Concrete Grade: DM

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	1480	9.05	2.62	50.9
26A	71-47	Presque Isle	275	1.68	2.62	9.5
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
		Total Wt	**2905**	**17.69**		100.0

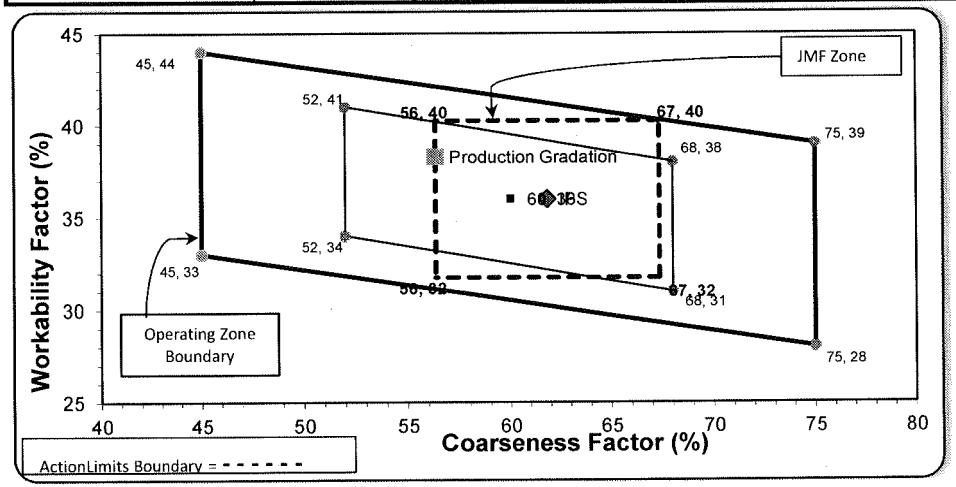
<----- Verify this number is 100%

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"	98.7	100.0	100.0	99.3	0.7	0.7
3/4"	84.4	100.0	100.0	92.1	7.3	7.9
1/2"	47.9	98.7	100.0	73.3	18.7	26.7
3/8"	31.3	87.6	100.0	63.8	9.5	36.2
#4	5.4	18.9	96.9	42.9	20.9	57.1
#8	3.6	4.9	84.6	35.8	7.1	64.2
#16	2.8	2.4	68.7	28.8	6.9	71.2
#30	2.6	2.0	48.7	20.8	8.1	79.2
#50	2.4	1.8	23.5	10.7	10.1	89.3
#100	2.2	1.7	6.1	3.7	7.0	96.3
LBW	1.7	1.4	0.9	1.4	2.3	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:	56	Workability Factor:	36	Adjusted WF 38.3



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.

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	%	

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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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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: DM

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	1705	10.43	2.62	58.7
26A	71-47	Presque Isle	100	0.61	2.62	3.4
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"	97.3	100.0	100.0	98.4	1.6	1.6
3/4"	84.2	100.0	100.0	90.7	7.7	9.3
1/2"	53.1	97.9	100.0	72.4	18.3	27.6
3/8"	32.1	88.9	100.0	59.8	12.6	40.2
#4	5.7	18.7	96.6	40.6	19.2	59.4
#8	2.6	4.8	84.6	33.7	6.8	66.3
#16	2.2	2.2	69.9	27.8	5.9	72.2
#30	2.1	1.8	49.3	20.0	7.9	80.0
#50	2.0	1.6	29.3	12.3	7.6	87.7
#100	1.9	1.5	8.7	4.5	7.9	95.5
LBW	1.5	1.2	1.1	1.3	3.1	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
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Suite 500
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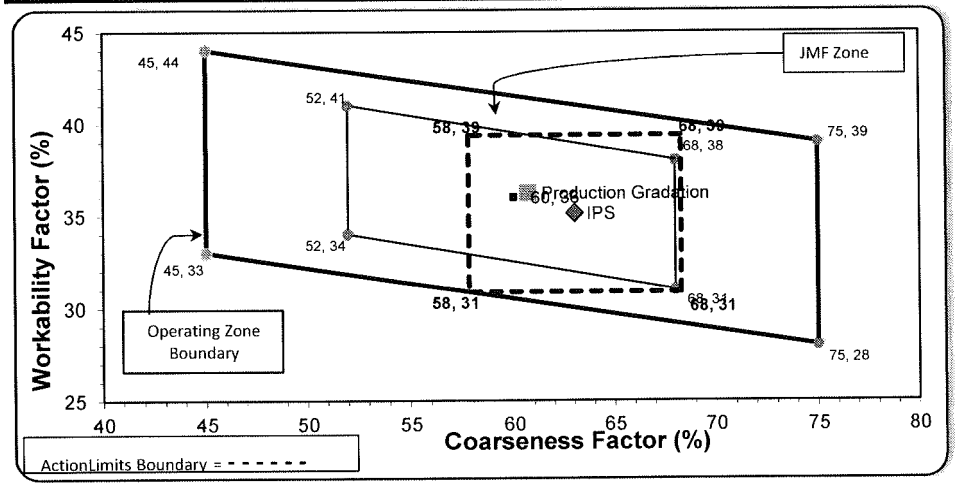
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	61	Workability Factor:	34	Adjusted WF 36.2



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 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	%	