Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 9/14/20

Concrete Grade: DM

Dates Test Represents: 9/15/2020 through 9/21/2020

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1455	8.90	2.62	50.1
26A	71-47	Presque Isle	350	2.14	2.62	12.0
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"	97.8	100.0	100.0	98.9	1.1	1.1
3/4"	80.6	100.0	100.0	90.3	8.6	9.7
1/2"	43.8	98.5	100.0	71.7	18.6	28.3
3/8"	27.7	81.8	100.0	61.6	10.1	38.4
#4	6.0	14.0	97.6	41.6	19.9	58.4
#8	2.7	3.3	84.0	33.6	8.1	66.4
#16	2.3	1.7	69.1	27.5	6.0	72.5
#30	2.1	1.4	49.9	20.1	7.4	79.9
#50	2.0	1.3	20.5	8.9	11.2	91.1
#100	1.9	1.2	3.5	2.4	6.5	97.6
LBW	1.5	0.8	1.1	1.3	1.2	98.7

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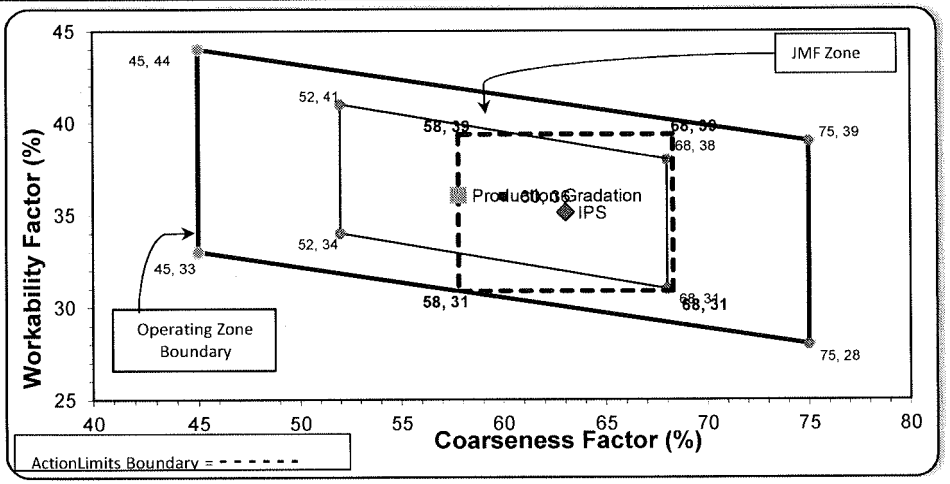
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	58	Workability Factor:	34	Adjusted WF 36.1



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 1051-6AA LS

Period: 09/13/2020 - 09/19/2020

Name/Title Doug Storey / QC Technician

Report Date 09/18/2020

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)	80.6	%	
	1/2" (12.5mm)	43.8	%	30-60
	3/8" (9.5mm)	27.7	%	
	#4 (4.75mm)	6.0	%	0-8
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	3.61	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1067-26A Mod LS

Period: 09/13/2020 - 09/19/2020

Name/Title Doug Storey / QC Technician

Report Date 09/18/2020

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)	98.5	%	95-100
	3/8" (9.5mm)	81.8	%	60-95
	#4 (4.75mm)	14.0	%	5-30
	#8 (2.36mm)	3.3	%	0-12
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.3	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.0	%	
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	3.26	%	

2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Period: 09/13/2020 - 09/19/2020

Name/Title Doug Storey / QC Technician

Report Date 09/18/2020

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)	84.0	%	65-95
	#16 (1.18mm)	69.1	%	35-75
	#30 (.6mm)	49.9	%	20-55
	#50 (.3mm)	20.5	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.77	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Contractor: _____

Sample Date: 9/14/20

Concrete Grade: DM

Dates Test Represents: 9/15/2020 through 9/21/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1500	8.94	2.69	50.8
26A	58-003	Stoneco	305	1.82	2.69	10.3
2NS	63-114	Highland	1150	6.95	2.65	38.9
		Total Wt	**2955**	**17.71**		100.0

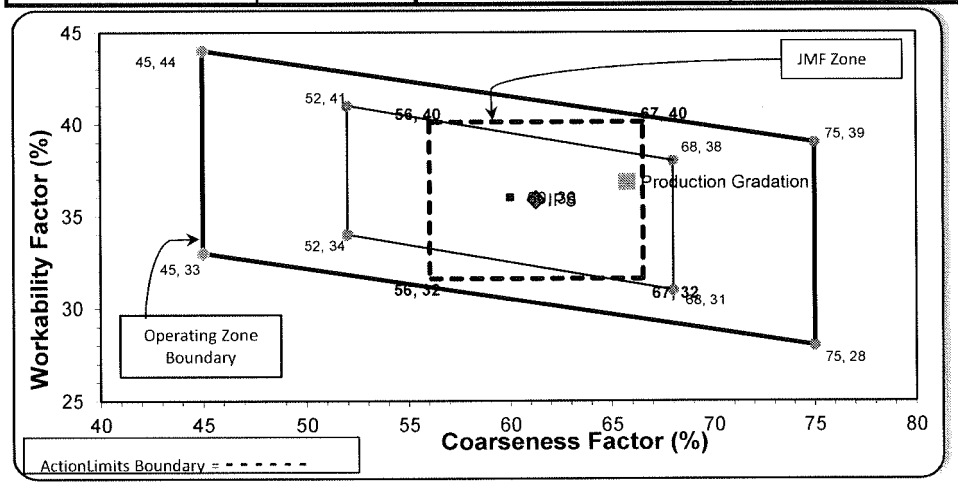
<----- Verify this number is 100%

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"	80.5	100.0	100.0	90.1	9.9	9.9
1/2"	39.4	100.0	100.0	69.2	20.9	30.8
3/8"	17.3	88.4	100.0	56.8	12.4	43.2
#4	4.2	22.0	99.4	43.1	13.7	56.9
#8	2.2	6.6	83.6	34.3	8.8	65.7
#16	1.8	3.2	66.0	26.9	7.4	73.1
#30	1.6	2.4	47.3	19.5	7.5	80.5
#50	1.5	2.2	22.9	9.9	9.6	90.1
#100	1.5	2.0	6.4	3.5	6.4	96.5
LBW	1.1	1.9	1.4	1.3	2.2	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:	66	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:

SUPERIOR MATERIALS

Plant S102-Superior Novi

Product 1051-6AA LS

Period: 09/13/2020 - 09/19/2020

Name/Title Doug Storey / QC Technician

Report Date 09/18/2020

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)	80.5	%	
	1/2" (12.5mm)	39.4	%	30-60
	3/8" (9.5mm)	17.3	%	
	#4 (4.75mm)	4.2	%	0-8
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.5	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.36	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	2.72	%	

SUPERIOR MATERIALS

Plant S102-Superior Novi

Product 1067-26A Mod LS

Period: 09/13/2020 - 09/19/2020

Name/Title Doug Storey / QC Technician

Report Date 09/18/2020

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)	100.0	%	95-100
	3/8" (9.5mm)	88.4	%	60-95
	#4 (4.75mm)	22.0	%	5-30
	#8 (2.36mm)	6.6	%	0-12
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	2.99	%	

Plant S102-Superior Novi

Product 1022-2NS GR

Period: 09/13/2020 - 09/19/2020

Name/Title Doug Storey / QC Technician

Report Date 09/18/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.4	%	95-100
	#8 (2.36mm)	83.6	%	65-95
	#16 (1.18mm)	66.0	%	35-75
	#30 (.6mm)	47.3	%	20-55
	#50 (.3mm)	22.9	%	10-30
	#100 (.15mm)	6.4	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	4.06	%	