Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 12/7/20

Concrete Grade: S2M

Contractor: _____

Dates Test Represents: 12/8/2020 through 12/14/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1620	9.91	2.62	53.1
26A	71-47	Presque Isle	200	1.22	2.62	6.6
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"	99.5	100.0	100.0	99.7	0.3	0.3
3/4"	82.7	100.0	100.0	90.8	8.9	9.2
1/2"	43.6	99.0	100.0	70.0	20.8	30.0
3/8"	25.8	89.1	100.0	59.9	10.1	40.1
#4	4.5	16.8	95.8	42.1	17.7	57.9
#8	2.2	4.5	82.9	34.9	7.2	65.1
#16	1.9	2.6	66.8	28.1	6.8	71.9
#30	1.8	2.3	46.6	19.9	8.2	80.1
#50	1.6	2.3	27.4	12.1	7.8	87.9
#100	1.6	2.3	9.5	4.8	7.2	95.2
LBW	1.2	1.4	1.2	1.2	3.6	98.8

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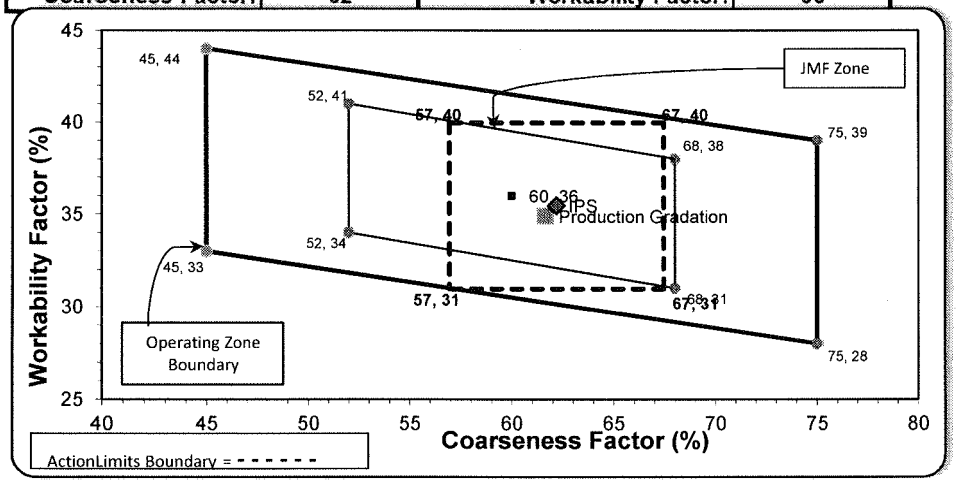
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	62	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.

Plant 958-JMT

Product 1054-6AA LS PI

Period: 12/06/2020 - 12/12/2020

Name/Title Doug Storey / QC Technician

Report Date 12/11/2020

Procedure	Sieve/Test	Result	Unit	6AA LS PI Spec
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	99.5	%	95-100
	3/4" (19mm)	82.7	%	
	1/2" (12.5mm)	43.6	%	30-60
	3/8" (9.5mm)	25.8	%	
	#4 (4.75mm)	4.5	%	0-8
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	2.8	%	

Edw. C. Levy Co.

Plant 958-JMT

Product 1067-26A Mod LS

Period: 12/06/2020 - 12/12/2020

Name/Title Doug Storey / QC Technician

Report Date 12/11/2020

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)	99.0	%	95-100
	3/8" (9.5mm)	89.1	%	60-95
	#4 (4.75mm)	16.8	%	5-30
	#8 (2.36mm)	4.5	%	0-12
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.7	%	

Edw. C. Levy Co.

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 12/06/2020 - 12/12/2020

Name/Title Doug Storey / QC Technician

Report Date 12/11/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.8	%	95-100
	#8 (2.36mm)	82.9	%	65-95
	#16 (1.18mm)	66.8	%	35-75
	#30 (.6mm)	46.6	%	20-55
	#50 (.3mm)	27.4	%	10-30
	#100 (.15mm)	9.5	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	4.7	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-02

Sample Date: 12/7/20

Concrete Grade: S2M

Contractor: _____

Dates Test Represents: 12/8/2020 through 12/14/2020

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	50.8
26A	71-47	Presque Isle	200	1.22	2.62	6.6
2NS	63-115	Ray Rd	1300	7.86	2.65	42.6
		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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	86.5	100.0	100.0	93.1	6.6	6.9
1/2"	46.7	98.5	100.0	72.8	20.3	27.2
3/8"	25.8	91.1	100.0	61.7	11.1	38.3
#4	4.9	19.7	96.0	44.7	17.0	55.3
#8	2.8	4.7	78.5	35.2	9.5	64.8
#16	2.4	2.5	62.4	28.0	7.2	72.0
#30	2.3	2.2	48.0	21.8	6.2	78.2
#50	2.2	2.1	24.2	11.6	10.2	88.4
#100	2.0	1.9	4.6	3.1	8.5	96.9
LBW	1.5	1.4	0.6	1.1	2.0	98.9

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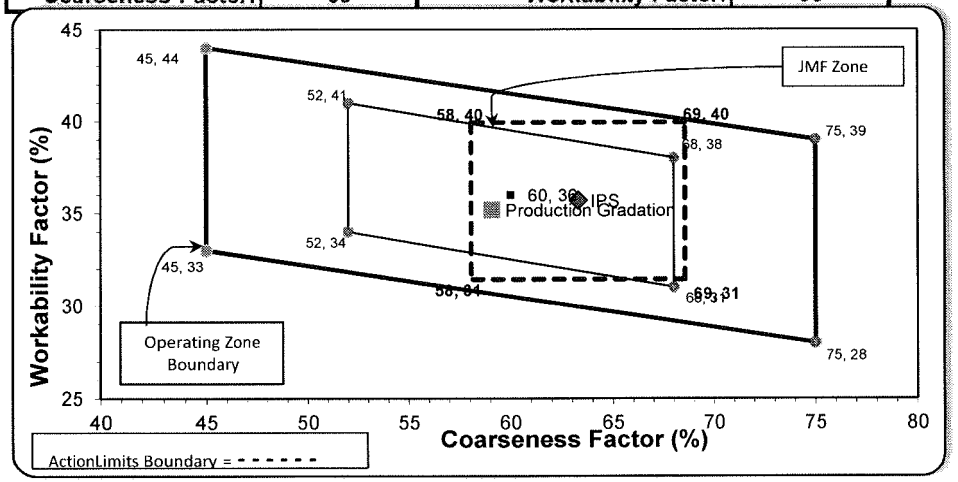
Farmington Hills, MI 48336

*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 SupplierGradations

Coarseness Factor:	59	Workability Factor:	35



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"	100.0	0.0	0.0
3/4"	95.6	4.4	4.4
1/2"	73.1	22.6	26.9
3/8"	59.3	13.8	40.7
#4	42.8	16.5	57.2
#8	35.7	7.1	64.3
#16	28.9	6.8	71.1
#30	20.7	8.2	79.3
#50	9.9	10.8	90.1
#100	2.1	7.8	97.9
LBW	0.9	1.2	99.1

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant S02-Superior Hoover

Product 1051-6AA LS

Period: 12/06/2020 - 12/12/2020

Name/Title Doug Storey / QC Technician

Report Date 12/11/2020

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)	86.5	%	
	1/2" (12.5mm)	46.7	%	30-60
	3/8" (9.5mm)	25.8	%	
	#4 (4.75mm)	4.9	%	0-8
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.71	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	3.82	%	

Plant S02-Superior Hoover

Product 1067-26A Mod LS

Period: 12/06/2020 - 12/12/2020

Name/Title Doug Storey / QC Technician

Report Date 12/11/2020

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)	98.5	%	95-100
	3/8" (9.5mm)	91.1	%	60-95
	#4 (4.75mm)	19.7	%	5-30
	#8 (2.36mm)	4.7	%	0-12
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	3.68	%	

Plant S02-Superior Hoover

Product 1022-2NS GR

Period: 12/06/2020 - 12/12/2020

Name/Title Doug Storey / QC Technician

Report Date 12/11/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.0	%	95-100
	#8 (2.36mm)	78.5	%	65-95
	#16 (1.18mm)	62.4	%	35-75
	#30 (.6mm)	48.0	%	20-55
	#50 (.3mm)	24.2	%	10-30
	#100 (.15mm)	4.6	%	0-10
	#200 (75µm)	0.8	%	
	FM	2.86		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	4.03	%	