

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

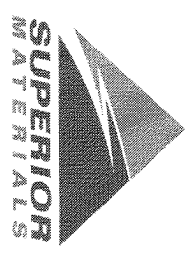
Sample Date: 5/16/22

Dates Test Represents: 5/17/2022 through 5/23/2022

Concrete Grade: P1M, 3500HP

Contractor: _____

MDOT No.: _____



Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

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

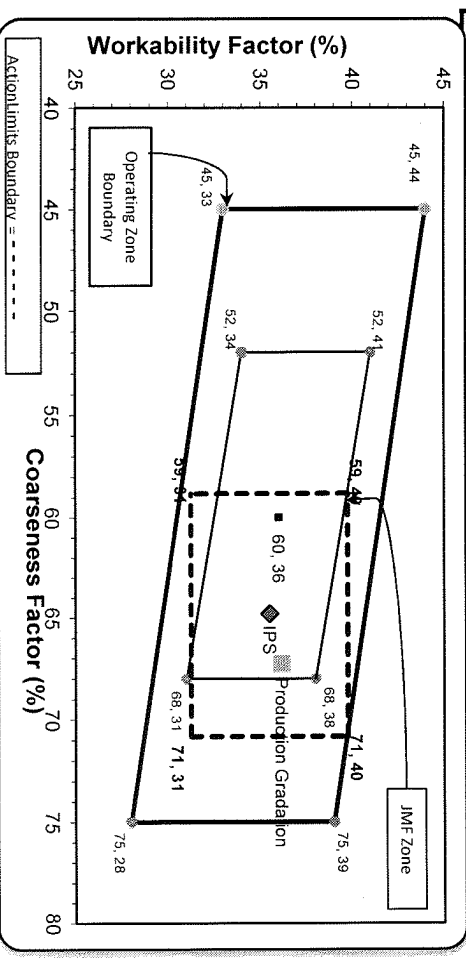
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		Total Wt	3070			100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.9	100.0	100.0	99.0	1.0	1.0
1"	54.0	100.0	100.0	84.7	14.3	15.3
3/4"	13.7	99.2	100.0	71.1	13.6	28.9
1/2"	3.7	80.1	100.0	62.8	8.3	37.2
3/8"	2.7	59.2	100.0	57.0	5.8	43.0
#4	2.1	14.2	96.2	43.6	13.5	56.4
#8	2.0	3.8	84.7	36.1	7.4	63.9
#16	1.9	2.5	69.1	29.4	6.7	70.6
#30	1.8	2.3	50.6	21.8	7.6	78.2
#50	1.7	2.2	24.9	11.3	10.5	88.7
#100	1.6	2.1	6.9	3.9	7.4	96.1
LBW	1.2	1.8	1.4	1.4	2.5	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: 67 Workability Factor: 36



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	65	36	0.0	0.0
1.5"			0.6	0.6
1"			15.3	16.0
3/4"			10.5	26.5
1/2"			8.2	34.8
3/8"			7.1	41.8
#4			14.1	55.9
#8			8.6	64.5
#16			6.4	70.9
#30			7.3	78.1
#50			12.2	90.4
#100			7.1	97.4
LBW			1.6	99.0

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 05/15/2022 - 05/21/2022

Report Date 05/20/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.2	%	95-100
	#8 (2.36mm)	84.7	%	65-95
	#16 (1.18mm)	69.1	%	35-75
	#30 (.6mm)	50.6	%	20-55
	#50 (.3mm)	24.9	%	10-30
	#100 (.15mm)	6.9	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.68		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	6.5	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/15/2022 - 05/21/2022

Report Date 05/20/2022

Procedure	Sieve/Test	Result	Unit	Intermed Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	99.2	%	
	1/2" (12.5mm)	80.1	%	
	3/8" (9.5mm)	59.2	%	
	#4 (4.75mm)	14.2	%	
	#8 (2.36mm)	3.8	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.8	%	0-3

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/15/2022 - 05/21/2022

Report Date 05/20/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.9	%	
	1" (25mm)	54.0	%	
	3/4" (19mm)	13.7	%	
	1/2" (12.5mm)	3.7	%	
	3/8" (9.5mm)	2.7	%	
	#4 (4.75mm)	2.1	%	
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.2	%	0-2

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

Sample Date: 5/16/22

Dates Test Represents: 5/17/2022 through 5/23/2022

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

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

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt:	3070	18.70		100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.1	100.0	100.0	99.3	0.7	0.7
1"	39.3	100.0	100.0	78.8	20.5	21.2
3/4"	9.8	98.7	100.0	68.2	10.6	31.8
1/2"	2.9	85.8	100.0	62.5	5.8	37.5
3/8"	2.3	68.1	100.0	57.6	4.8	42.4
#4	2.1	18.7	97.6	43.8	13.9	56.2
#8	2.0	5.1	83.5	34.7	9.1	65.3
#16	1.9	3.2	68.3	28.2	6.5	71.8
#30	1.8	2.8	51.4	21.4	6.7	78.6
#50	1.7	2.7	22.6	10.1	11.3	89.9
#100	1.6	2.5	3.1	2.4	7.7	97.6
LBW	1.2	2.0	0.5	1.1	1.3	98.9

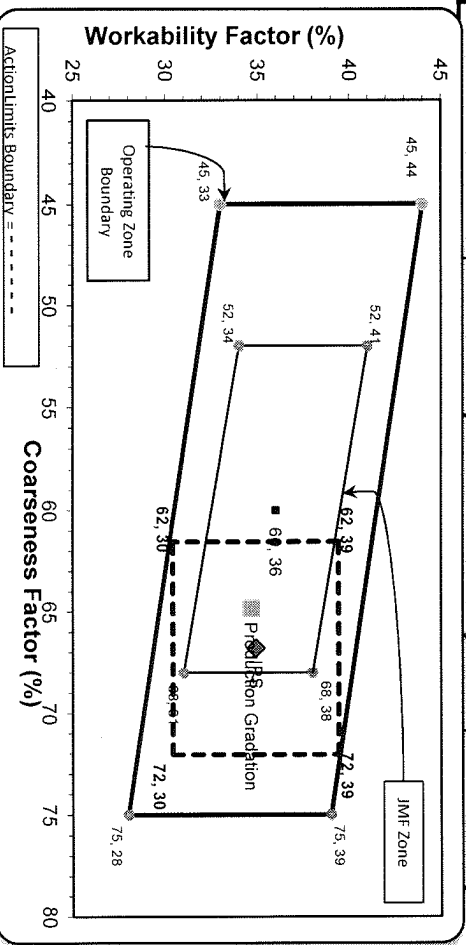
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **65** Workability Factor: **35**

Coarseness Factor: **67** 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"	85.0	15.0	15.0
3/4"	72.1	12.9	27.9
1/2"	64.5	7.6	35.5
3/8"	56.5	8.0	43.5
#4	42.7	13.8	57.3
#8	34.9	7.8	65.1
#16	29.0	5.9	71.0
#30	21.0	8.0	79.0
#50	8.2	12.8	91.8
#100	1.6	6.5	98.4
LBW	0.7	0.9	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: 05/15/2022 - 05/21/2022

Report Date 05/20/2022

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)	83.5	%	65-95
	#16 (1.18mm)	68.3	%	35-75
	#30 (.6mm)	51.4	%	20-55
	#50 (.3mm)	22.6	%	10-30
	#100 (.15mm)	3.1	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.74		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	4.89	%	



Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/15/2022 - 05/21/2022

Report Date 05/20/2022

Procedure	Sieve/Test	Result	Unit	Intermed Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	100.0	%	
	3/4" (19mm)	98.7	%	
	1/2" (12.5mm)	85.8	%	
	3/8" (9.5mm)	68.1	%	
	#4 (4.75mm)	18.7	%	
	#8 (2.36mm)	5.1	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3



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Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/15/2022 - 05/21/2022

Report Date 05/20/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.1	%	
	1" (25mm)	39.3	%	
	3/4" (19mm)	9.8	%	
	1/2" (12.5mm)	2.9	%	
	3/8" (9.5mm)	2.3	%	
	#4 (4.75mm)	2.1	%	
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.2	%	0-2