

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-02

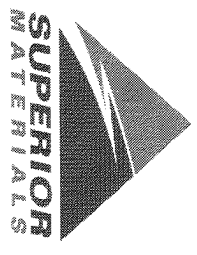
Sample Date: 5/22/22

Dates Test Represents: 5/3/2022 through 5/9/2022

Concrete Grade: P1M, 3500HP

Contractor: _____

MDOT No.: _____



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

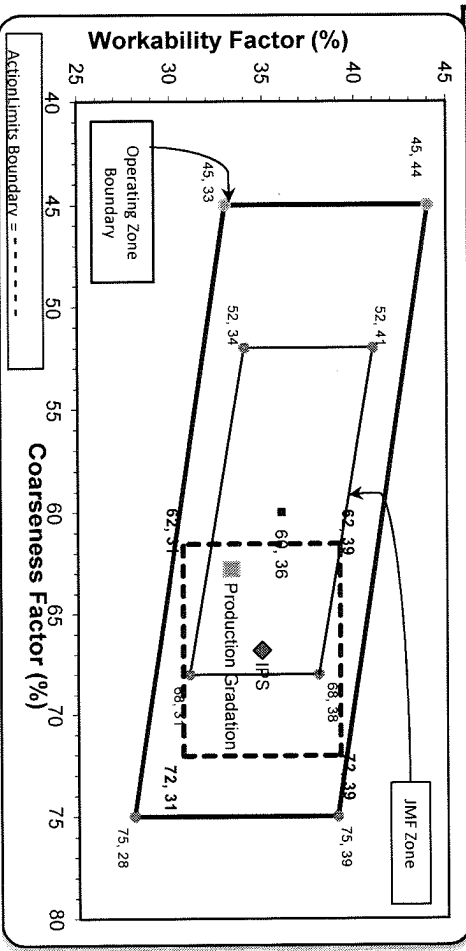
Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	850	5.20	2.62	27.7
NNS	63-115	Ray Rd	1250	7.56	2.65	40.7
			Total Wt:	3070		100.0

Sieve	CA	IA	NNS	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"	47.1	100.0	100.0	83.3	16.7	16.7
3/4"	14.8	99.7	100.0	73.0	27.0	43.7
1/2"	2.4	83.1	100.0	64.5	35.5	79.2
3/8"	1.6	61.0	100.0	58.1	41.9	121.1
#4	1.3	16.4	95.3	43.8	56.2	177.3
#8	1.3	6.9	76.0	33.3	66.7	244.0
#16	1.3	4.3	60.5	26.2	73.8	317.8
#30	1.3	3.5	46.7	20.4	79.6	397.4
#50	1.2	3.1	24.5	11.2	88.8	486.2
#100	1.1	2.8	5.0	3.2	96.8	583.0
LBW	0.8	2.2	0.9	1.2	98.8	681.8

*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: 63 **Workability Factor:** 33



Sieve	Initial Production Sample (IPS)	Coarseness Factor:	Workability Factor:
2"	100.0	67	35
1.5"	100.0	0.0	0.0
1"	85.0	15.0	15.0
3/4"	72.3	12.7	27.7
1/2"	64.5	7.8	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: _____



Plant S02-Superior Hoover

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/09/2022 - 05/09/2022

Report Date 05/09/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	47.1	%	
	3/4" (19mm)	14.8	%	
	1/2" (12.5mm)	2.4	%	
	3/8" (9.5mm)	1.6	%	
	#4 (4.75mm)	1.3	%	
	#8 (2.36mm)	1.3	%	
	#16 (1.18mm)	1.3	%	
	#30 (.6mm)	1.3	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	1.05	%	



Plant S02-Superior Hoover

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/09/2022 - 05/09/2022

Report Date 05/09/2022

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)	99.7	%	
	1/2" (12.5mm)	83.1	%	
	3/8" (9.5mm)	61.0	%	
	#4 (4.75mm)	16.4	%	
	#8 (2.36mm)	6.9	%	
	#16 (1.18mm)	4.3	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	3.18	%	



Plant S02-Superior Hoover
Product 1022-2NS GR
Period: 05/09/2022 - 05/09/2022

Name/Title Doug Storey / QC Technician
Report Date 05/09/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.3	%	95-100
	#8 (2.36mm)	76.0	%	65-95
	#16 (1.18mm)	60.5	%	35-75
	#30 (.6mm)	46.7	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	5.0	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.92		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.50	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **5/2/22**

Dates Test Represents: **5/3/2022** through **5/9/2022**

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



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

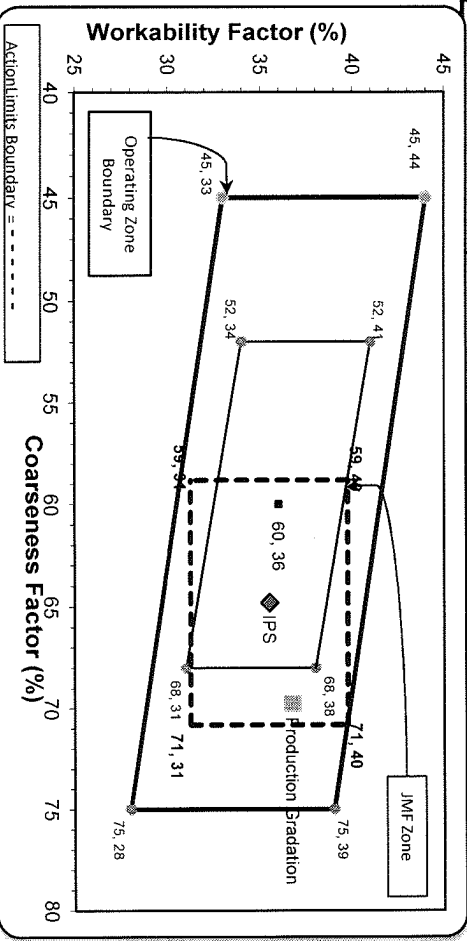
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	950	5.81	2.62	30.9
N2S	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

Sieve	CA	IA	N2S	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.3	100.0	100.0	99.2	0.8	0.8
1"	44.3	100.0	100.0	84.2	15.0	15.8
3/4"	10.1	97.6	100.0	73.8	10.4	26.2
1/2"	2.6	73.6	100.0	64.2	9.6	35.8
3/8"	1.8	47.3	100.0	55.9	8.4	44.1
#4	1.7	10.7	97.2	43.4	12.5	56.6
#8	1.6	5.1	85.2	36.7	6.6	63.3
#16	1.6	3.9	70.8	30.5	6.2	69.5
#30	1.5	3.5	51.8	22.6	7.9	77.4
#50	1.4	3.1	25.3	11.7	10.9	88.3
#100	1.3	2.7	7.4	4.2	7.4	95.8
LBW	1.0	2.1	1.7	1.6	2.6	98.4

*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: **70** Workability Factor: **37**



Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.0	0.6	0.6
1"	84.0	15.3	16.0
3/4"	73.5	10.5	26.5
1/2"	65.2	8.2	34.8
3/8"	58.2	7.1	41.8
#4	44.1	14.1	55.9
#8	35.5	8.6	64.5
#16	29.1	6.4	70.9
#30	21.9	7.3	78.1
#50	9.6	12.2	90.4
#100	2.6	7.1	97.4
LBW	1.0	1.6	99.0

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT
 Product 1022-2NS GR - Smelter Bay
 Period: 05/01/2022 - 05/07/2022

Name/Title Doug Storey / QC Technician
 Report Date 05/06/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.2	%	95-100
	#8 (2.36mm)	85.2	%	65-95
	#16 (1.18mm)	70.8	%	35-75
	#30 (.6mm)	51.8	%	20-55
	#50 (.3mm)	25.3	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.62		2.6-3
	Wash Loss (#200/75µm)	1.7	%	0-3

Plant: 958-JMT
 Product: 7920-INTERMED AGG P1M LS PI
 Period: 05/01/2022 - 05/07/2022

Name/Title: Doug Storey / QC Technician
 Report Date: 05/06/2022

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)	97.6	%	
	1/2" (12.5mm)	73.6	%	
	3/8" (9.5mm)	47.3	%	
	#4 (4.75mm)	10.7	%	
	#8 (2.36mm)	5.1	%	
	#16 (1.18mm)	3.9	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	4.3	%	

Plant: 958-JMT
Product: 7919-COARSE AGG P1M LS PI
Period: 05/01/2022 - 05/07/2022

Name/Title: Doug Storey / QC Technician
Report Date: 05/06/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.3	%	
	1" (25mm)	44.3	%	
	3/4" (19mm)	10.1	%	
	1/2" (12.5mm)	2.6	%	
	3/8" (9.5mm)	1.8	%	
	#4 (4.75mm)	1.7	%	
	#8 (2.36mm)	1.6	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	2.3	%	