

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

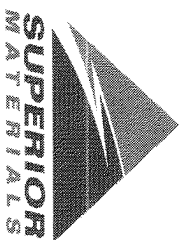
Sample Date: **11/2/20**

Dates Test Represents: **11/3/2020** through **11/9/2020**

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



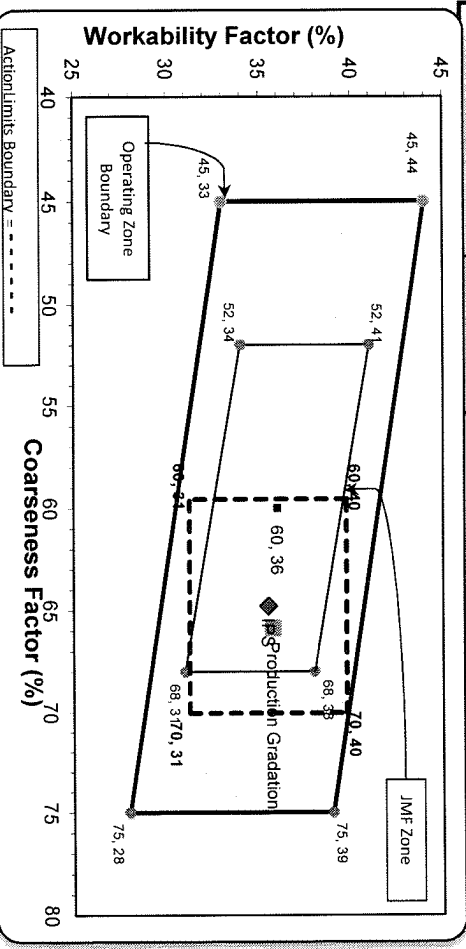
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	900	5.50	2.62	29.3
ZNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		Total Wt	3070			100.0

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	95.9	100.0	100.0	98.8	1.2	1.2
1"	39.2	100.0	100.0	81.8	17.0	18.2
3/4"	9.8	96.0	100.0	71.8	10.0	28.2
1/2"	3.4	79.5	100.0	65.0	6.8	35.0
3/8"	2.8	55.0	100.0	57.7	7.4	42.3
#4	2.6	12.0	95.1	43.0	14.7	57.0
#8	2.5	4.4	82.8	35.8	7.3	64.2
#16	2.5	3.1	67.3	29.1	6.7	70.9
#30	2.4	2.8	46.5	20.5	8.6	79.5
#50	2.4	2.8	24.4	11.5	9.0	88.5
#100	2.2	2.8	8.6	5.0	6.5	95.0
LBW	1.8	1.9	1.1	1.5	3.4	98.5

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **66** Workability Factor: **36**



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

*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.

PREPARED BY:
SM, LLC Technical Service

Approved By:

Plant 958-JMT
 Product 7919-COARSE AGG P1M LS PI
 Period: 11/01/2020 - 11/07/2020

Name/Title Doug Storey / QC Technician
 Report Date 11/06/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	95.9	%	
	1" (25mm)	39.2	%	
	3/4" (19mm)	9.8	%	
	1/2" (12.5mm)	3.4	%	
	3/8" (9.5mm)	2.8	%	
	#4 (4.75mm)	2.6	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.5	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	2.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 11/01/2020 - 11/07/2020

Report Date 11/06/2020

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)	96.0	%	
	1/2" (12.5mm)	79.5	%	
	3/8" (9.5mm)	55.0	%	
	#4 (4.75mm)	12.0	%	
	#8 (2.36mm)	4.4	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	3.8	%	

Plant 958-JMT
Product 1022-2NS GR - Smelter Bay
Period: 11/01/2020 - 11/07/2020

Name/Title Doug Storey / QC Technician
Report Date 11/06/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.1	%	95-100
	#8 (2.36mm)	82.8	%	65-95
	#16 (1.18mm)	67.3	%	35-75
	#30 (.6mm)	46.5	%	20-55
	#50 (.3mm)	24.4	%	10-30
	#100 (.15mm)	8.6	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	5.1	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

Sample Date: **11/21/20**

Dates Test Represents: **11/3/2020** through **11/9/2020**

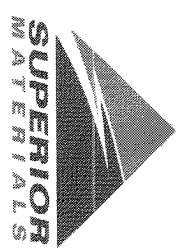
Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	960	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
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"	97.1	100.0	100.0	99.1	0.9	0.9
1"	30.5	100.0	100.0	78.5	20.6	21.5
3/4"	11.6	98.5	100.0	72.2	6.3	27.8
1/2"	5.9	81.4	100.0	65.3	6.9	34.7
3/8"	4.7	57.2	100.0	57.7	7.6	42.3
#4	2.8	11.0	98.2	42.5	15.1	57.5
#8	2.5	3.9	88.3	36.5	6.1	63.5
#16	2.4	2.9	67.8	28.1	8.3	71.9
#30	2.3	2.7	48.6	20.5	7.6	79.5
#50	2.3	2.6	26.4	11.8	8.7	88.2
#100	2.2	2.4	9.5	5.1	6.7	94.9
LBW	1.7	2.0	1.0	1.5	3.6	98.5

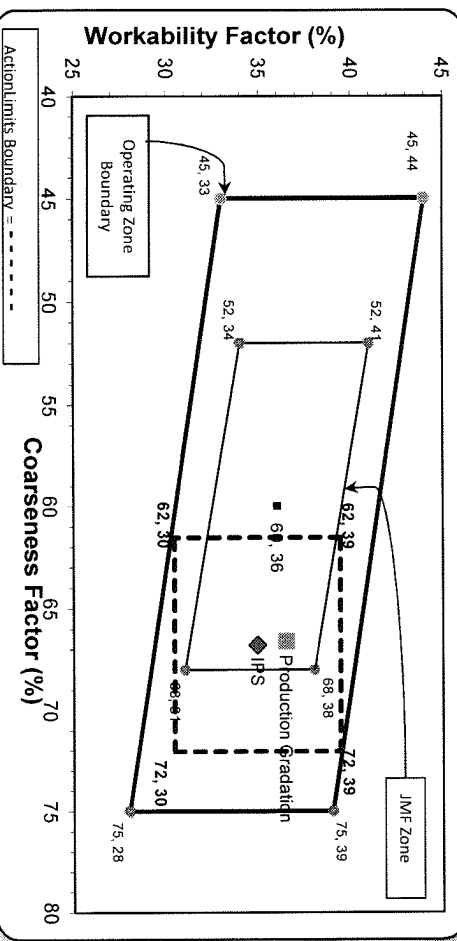


Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

*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 Supplier Gradations

Coarseness Factor: **67** Workability Factor: **36**



Initial Production Sample (IPS)

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: _____



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
Product 7919-COARSE AGG P1M LS
Period: 11/01/2020 - 11/07/2020

Name/Title Doug Storey / QC Technician
Report Date 11/06/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.1	%	
	1" (25mm)	30.5	%	
	3/4" (19mm)	11.6	%	
	1/2" (12.5mm)	5.9	%	
	3/8" (9.5mm)	4.7	%	
	#4 (4.75mm)	2.8	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	1.36	%	



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: 11/01/2020 - 11/07/2020

Report Date 11/06/2020

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)	98.5	%	
	1/2" (12.5mm)	81.4	%	
	3/8" (9.5mm)	57.2	%	
	#4 (4.75mm)	11.0	%	
	#8 (2.36mm)	3.9	%	
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.59	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 11/01/2020 - 11/07/2020

Report Date 11/06/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.2	%	95-100
	#8 (2.36mm)	88.3	%	65-95
	#16 (1.18mm)	67.8	%	35-75
	#30 (.6mm)	48.6	%	20-55
	#50 (.3mm)	26.4	%	10-30
	#100 (.15mm)	9.5	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.61		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.76	%	