

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-20**

Sample Date: **9/28/20**

Dates Test Represents: **9/29/2020** through **10/5/2020**

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

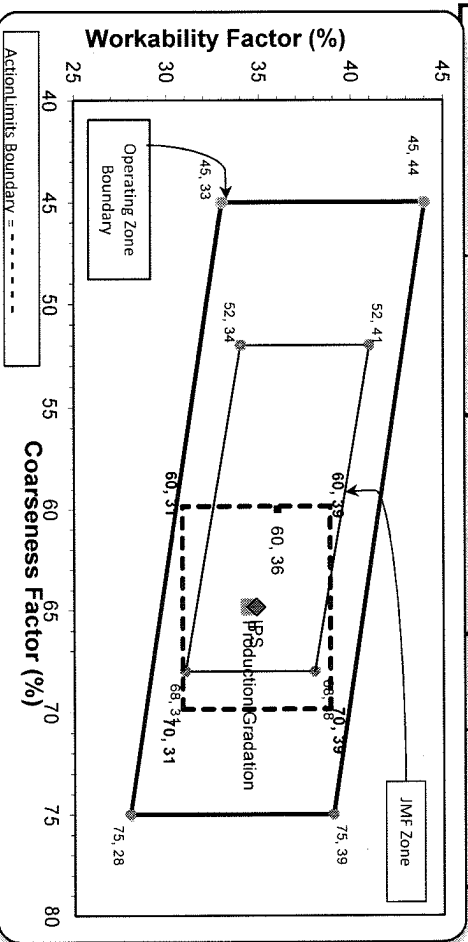
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

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

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.8	100.0	100.0	99.0	1.0	1.0
1"	42.9	100.0	100.0	82.3	16.7	17.7
3/4"	9.5	100.0	100.0	72.0	10.3	28.0
1/2"	2.5	88.8	100.0	66.5	5.5	33.5
3/8"	1.9	59.5	100.0	57.5	9.0	42.5
#4	1.5	17.6	96.9	43.6	13.9	56.4
#8	1.5	4.5	83.5	34.5	9.2	65.5
#16	1.5	2.4	67.2	27.5	7.0	72.5
#30	1.4	2.0	45.6	18.9	8.6	81.1
#50	1.4	1.8	18.2	8.1	10.8	91.9
#100	1.4	1.7	3.2	2.2	5.9	97.8
LBW	1.0	1.3	0.8	1.0	1.2	99.0

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

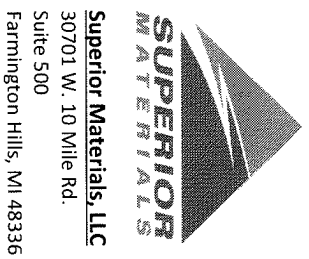
Coarseness Factor: **65** Workability Factor: **34**



Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.1	0.9	0.9
1"	80.8	18.2	19.2
3/4"	71.3	9.6	28.7
1/2"	64.0	7.3	36.0
3/8"	57.7	6.2	42.3
#4	42.8	15.0	57.2
#8	34.8	7.9	65.2
#16	28.4	6.4	71.6
#30	20.2	8.2	79.8
#50	7.6	12.6	92.4
#100	1.6	6.0	98.4
LBW	1.0	0.6	99.0

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



*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 S20-Superior Flint

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.8	%	
	1" (25mm)	42.9	%	
	3/4" (19mm)	9.5	%	
	1/2" (12.5mm)	2.5	%	
	3/8" (9.5mm)	1.9	%	
	#4 (4.75mm)	1.5	%	
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	0.78	%	



Plant S20-Superior Flint
 Product 7920-INTERMED AGG P1M LS
 Period: 09/27/2020 - 10/03/2020

Name/Title Doug Storey / QC Technician
 Report Date 10/05/2020

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)	100.0	%	
	1/2" (12.5mm)	88.8	%	
	3/8" (9.5mm)	59.5	%	
	#4 (4.75mm)	17.6	%	
	#8 (2.36mm)	4.5	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.0	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.96	%	



Plant S20-Superior Flint

Product 1022-2NS GR

Period: 09/27/2020 - 10/03/2020

Name/Title Doug Storey / QC Technician

Report Date 10/03/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.9	%	95-100
	#8 (2.36mm)	83.5	%	65-95
	#16 (1.18mm)	67.2	%	35-75
	#30 (.6mm)	45.6	%	20-55
	#50 (.3mm)	18.2	%	10-30
	#100 (.15mm)	3.2	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.85		2.6-3
	Wash Loss (#200/75µm)	0.8	%	0-3
	Total Moisture	3.11	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **9/28/20**

Dates Test Represents: **9/29/2020** through **10/5/2020**

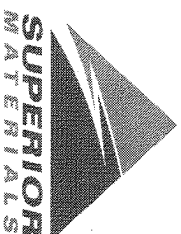
Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
ZNS	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		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"	94.8	100.0	100.0	98.4	1.6	1.6
1"	35.5	100.0	100.0	80.0	18.4	20.0
3/4"	8.7	97.7	100.0	71.1	9.0	28.9
1/2"	4.0	77.9	100.0	63.7	7.4	36.3
3/8"	3.0	54.1	100.0	56.2	7.4	43.8
#4	2.0	12.3	96.7	42.1	14.1	57.9
#8	1.8	5.4	83.5	34.8	7.3	65.2
#16	1.7	4.2	67.4	28.1	6.7	71.9
#30	1.7	3.9	47.1	20.1	8.0	79.9
#50	1.6	3.7	22.6	10.4	9.7	89.6
#100	1.5	3.4	6.2	3.9	6.5	96.1
LBW	1.1	2.7	1.0	1.5	2.4	98.5



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

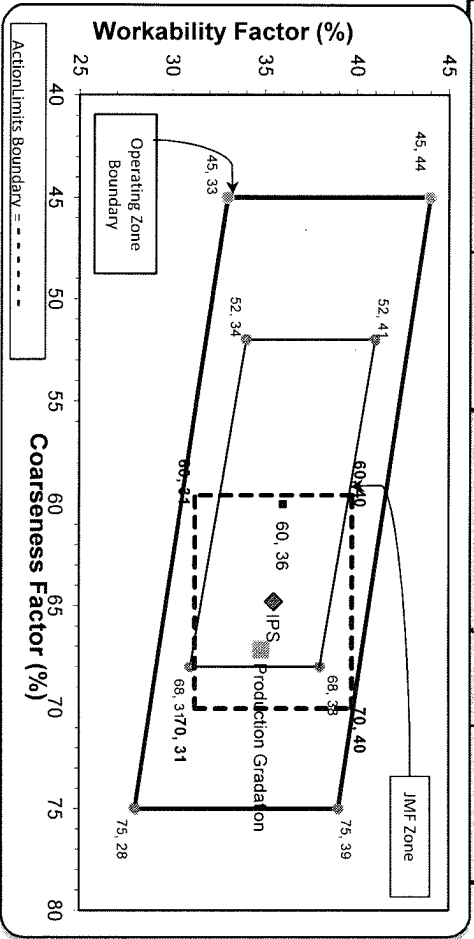
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **67** Workability Factor: **35**

Coarseness Factor: **65** Workability Factor: **36**



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 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.8	%	
	1" (25mm)	35.5	%	
	3/4" (19mm)	8.7	%	
	1/2" (12.5mm)	4.0	%	
	3/8" (9.5mm)	3.0	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	3.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

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)	97.7	%	
	1/2" (12.5mm)	77.9	%	
	3/8" (9.5mm)	54.1	%	
	#4 (4.75mm)	12.3	%	
	#8 (2.36mm)	5.4	%	
	#16 (1.18mm)	4.2	%	
	#30 (.6mm)	3.9	%	
	#50 (.3mm)	3.7	%	
	#100 (.15mm)	3.4	%	
	#200 (75µm)	3.0	%	
	Wash Loss (#200/75um)	2.7	%	0-3
	Total Moisture	3.0	%	

Edw. C. Levy Co.

8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.7	%	95-100
	#8 (2.36mm)	83.5	%	65-95
	#16 (1.18mm)	67.4	%	35-75
	#30 (.6mm)	47.1	%	20-55
	#50 (.3mm)	22.6	%	10-30
	#100 (.15mm)	6.2	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	5.0	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

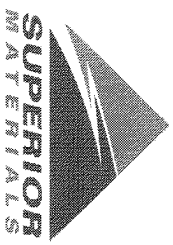
Sample Date: **9/28/20**

Dates Test Represents: **9/29/2020** through **10/5/2020**

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



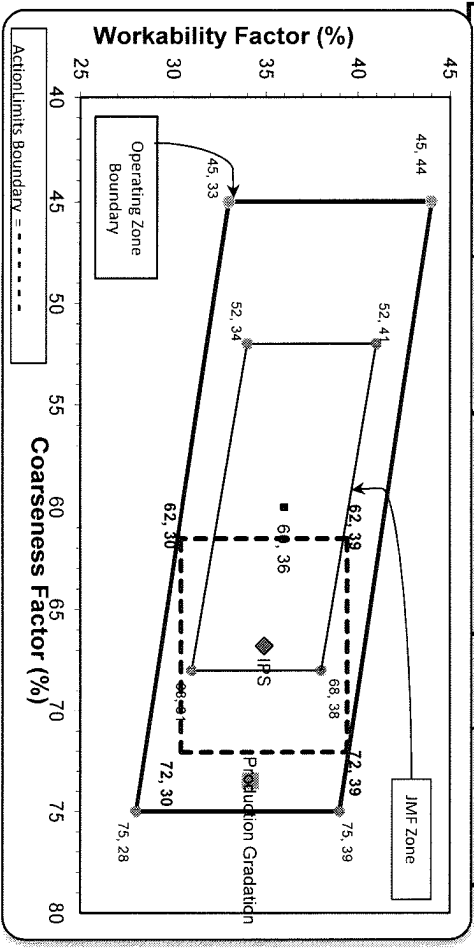
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
		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"	96.4	100.0	100.0	98.9	1.1	1.1
1"	39.5	100.0	100.0	80.9	18.0	19.1
3/4"	13.6	98.6	100.0	72.3	8.6	27.7
1/2"	5.2	70.4	100.0	61.4	10.9	38.6
3/8"	3.6	38.9	100.0	51.6	9.7	48.4
#4	2.3	4.2	97.7	40.1	11.5	59.9
#8	2.1	1.9	84.3	34.2	6.0	65.8
#16	2.0	1.4	69.0	28.0	6.2	72.0
#30	1.9	1.3	47.6	19.6	8.4	80.4
#50	1.8	1.2	19.3	8.5	11.1	91.5
#100	1.7	1.1	3.5	2.2	6.2	97.8
LBW	1.4	0.7	1.1	1.1	1.2	98.9

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **73** Workability Factor: **34**



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

*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: _____



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.4	%	
	1" (25mm)	39.5	%	
	3/4" (19mm)	13.6	%	
	1/2" (12.5mm)	5.2	%	
	3/8" (9.5mm)	3.6	%	
	#4 (4.75mm)	2.3	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	2.32	%	



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: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

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)	98.6	%	
	1/2" (12.5mm)	70.4	%	
	3/8" (9.5mm)	38.9	%	
	#4 (4.75mm)	4.2	%	
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.4	%	
	#30 (.6mm)	1.3	%	
	#50 (.3mm)	1.2	%	
	#100 (.15mm)	1.1	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75um)	0.7	%	0-3
	Total Moisture	3.58	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/27/2020 - 10/03/2020

Report Date 10/03/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.7	%	95-100
	#8 (2.36mm)	84.3	%	65-95
	#16 (1.18mm)	69.0	%	35-75
	#30 (.6mm)	47.6	%	20-55
	#50 (.3mm)	19.3	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	1.2	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.54	%	