

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-20

Sample Date: 10/19/20

Dates Test Represents: 10/20/2020 through 10/26/2020

Concrete Grade: P-1M

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			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"	99.6	100.0	100.0	99.9	0.1	0.1
1"	41.0	100.0	100.0	81.7	18.1	18.3
3/4"	7.5	99.0	100.0	71.1	10.7	28.9
1/2"	3.3	88.6	100.0	66.7	4.4	33.3
3/8"	2.7	68.4	100.0	60.4	6.2	39.6
#4	2.5	17.7	95.9	43.6	16.9	56.4
#8	2.4	6.1	84.4	35.6	8.0	64.4
#16	2.4	3.8	70.4	29.4	6.2	70.6
#30	2.3	3.4	48.9	20.8	8.6	79.2
#50	2.3	2.9	24.1	11.0	9.8	89.0
#100	2.1	2.7	4.8	3.3	7.7	96.7
LBW	2.0	2.2	1.3	1.8	1.5	98.2

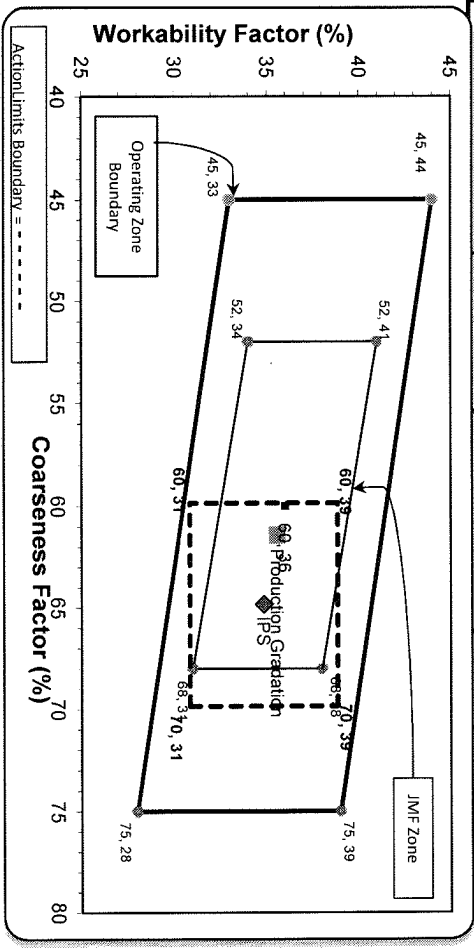
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size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



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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 61 Workability Factor: 36



Initial Production Sample (IPS)

Coarseness Factor: 65 Workability Factor: 35

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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S20-Superior Flint
 Product 7919-COARSE AGG P1M LS
 Period: 10/18/2020 - 10/24/2020

Name/Title Doug Storey / QC Technician
 Report Date 10/26/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	99.6	%	
	1" (25mm)	41.0	%	
	3/4" (19mm)	7.5	%	
	1/2" (12.5mm)	3.3	%	
	3/8" (9.5mm)	2.7	%	
	#4 (4.75mm)	2.5	%	
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	2.0	%	0-2
	Total Moisture	2.32	%	



Plant S20-Superior Flint
 Product 7920-INTERMED AGG P1M LS
 Period: 10/18/2020 - 10/24/2020

Name/Title Doug Storey / QC Technician
 Report Date 10/26/2020

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)	99.0	%	
	1/2" (12.5mm)	88.6	%	
	3/8" (9.5mm)	68.4	%	
	#4 (4.75mm)	17.7	%	
	#8 (2.36mm)	6.1	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	3.43	%	



Plant S20-Superior Flint
Product 1022-2NS GR
Period: 10/18/2020 - 10/24/2020

Name/Title Doug Storey / QC Technician
Report Date 10/26/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.9	%	95-100
	#8 (2.36mm)	84.4	%	65-95
	#16 (1.18mm)	70.4	%	35-75
	#30 (.6mm)	48.9	%	20-55
	#50 (.3mm)	24.1	%	10-30
	#100 (.15mm)	4.8	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	4.82	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

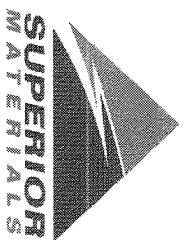
Sample Date: 10/19/20

Dates Test Represents: 10/20/2020 through 10/26/2020

Concrete Grade: **P1M**

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	790	4.83	2.62	25.7
IA	71-47	Presque Isle	1030	6.30	2.62	33.6
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		Total Wt	3070	18.69		100.0

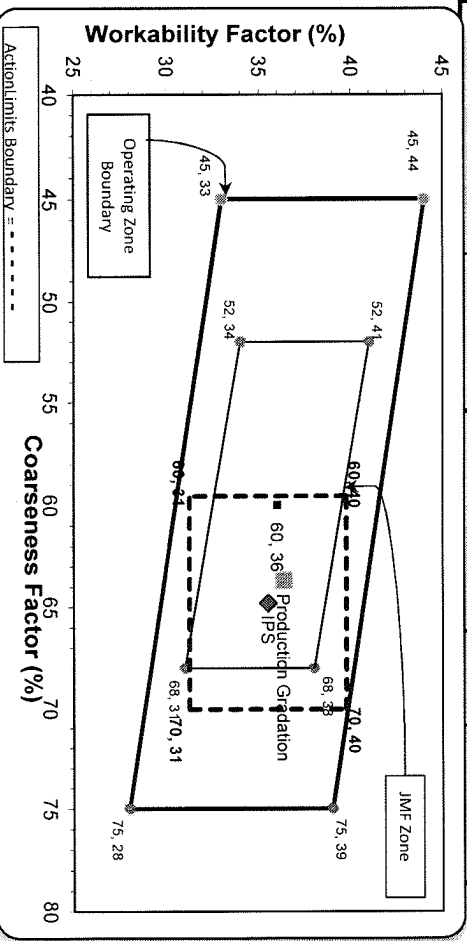
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.2	100.0	100.0	99.5	0.5	0.5
1"	47.1	100.0	100.0	86.4	13.1	13.6
3/4"	10.4	98.2	100.0	76.3	10.0	23.7
1/2"	4.9	80.7	100.0	69.1	7.3	30.9
3/8"	3.9	52.9	100.0	59.5	9.6	40.5
#4	3.0	11.0	96.0	43.6	15.9	56.4
#8	2.9	5.0	83.3	36.3	7.2	63.7
#16	2.7	3.7	67.1	29.3	7.1	70.7
#30	2.6	3.3	46.7	20.8	8.5	79.2
#50	2.5	3.2	22.1	10.7	10.1	89.3
#100	2.3	3.0	6.1	4.1	6.6	95.9
LBW	1.8	2.0	1.0	1.5	2.5	98.5

Verify this number is 100%

*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: **64** 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 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/18/2020 - 10/24/2020

Report Date 10/26/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.2	%	
	1" (25mm)	47.1	%	
	3/4" (19mm)	10.4	%	
	1/2" (12.5mm)	4.9	%	
	3/8" (9.5mm)	3.9	%	
	#4 (4.75mm)	3.0	%	
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	4.2	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/18/2020 - 10/24/2020

Report Date 10/26/2020

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)	98.2	%	
	1/2" (12.5mm)	80.7	%	
	3/8" (9.5mm)	52.9	%	
	#4 (4.75mm)	11.0	%	
	#8 (2.36mm)	5.0	%	
	#16 (1.18mm)	3.7	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.7	%	

Edw. C. Levy Co.

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Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 10/18/2020 - 10/24/2020

Report Date 10/26/2020

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)	83.3	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	46.7	%	20-55
	#50 (.3mm)	22.1	%	10-30
	#100 (.15mm)	6.1	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.3	%	