

Aggregate Optimization Chart

PLANT #: **P-20**

Contractor: _____

Sample Date: 10/12/20

Concrete Grade: **P-1M**

Dates Test Represents: 10/13/2020 through 10/19/2020

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

Verify this number is 100%

% Retained	Cumulative % Retained
0.0	0.0
0.5	0.5
19.5	20.0
8.7	28.7
6.2	34.9
6.6	41.5
15.5	57.0
8.2	65.2
6.5	71.7
7.3	79.1
10.9	90.0
7.2	97.2
1.3	98.5

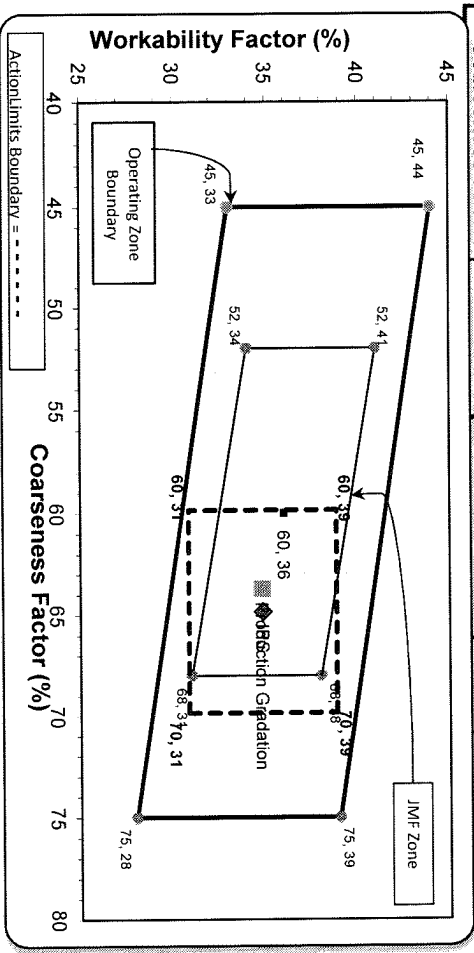
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.4	100.0	100.0	99.5	0.5	0.5
1"	35.4	100.0	100.0	80.0	19.5	20.0
3/4"	8.8	98.3	100.0	71.3	8.7	28.7
1/2"	2.8	83.9	100.0	65.1	6.2	34.9
3/8"	2.3	62.3	100.0	58.5	6.6	41.5
#4	2.0	15.4	96.5	43.0	15.5	57.0
#8	1.9	5.9	83.0	34.8	8.2	65.2
#16	1.9	3.7	68.0	28.3	6.5	71.7
#30	1.8	3.2	49.7	20.9	7.3	79.1
#50	1.7	2.8	22.1	10.0	10.9	90.0
#100	1.6	2.5	3.9	2.8	7.2	97.2
LBW	1.4	1.9	1.2	1.5	1.3	98.5

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **64** Workability Factor: **35**

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 1022-2NS GR

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.5	%	95-100
	#8 (2.36mm)	83.0	%	65-95
	#16 (1.18mm)	68.0	%	35-75
	#30 (.6mm)	49.7	%	20-55
	#50 (.3mm)	22.1	%	10-30
	#100 (.15mm)	3.9	%	0-10
	#200 (75µm)	1.5	%	
	FM	2.77		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	3.34	%	



Plant S20-Superior Flint

Product 7920-INTERMED AGG P1M LS

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

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)	98.3	%	
	1/2" (12.5mm)	83.9	%	
	3/8" (9.5mm)	62.3	%	
	#4 (4.75mm)	15.4	%	
	#8 (2.36mm)	5.9	%	
	#16 (1.18mm)	3.7	%	
	#30 (.6mm)	3.2	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	3.44	%	



Plant S20-Superior Flint

Product 7919-COARSE AGG P1M LS

Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician

Report Date 10/16/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.4	%	
	1" (25mm)	35.4	%	
	3/4" (19mm)	8.8	%	
	1/2" (12.5mm)	2.8	%	
	3/8" (9.5mm)	2.3	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	1.26	%	

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 10/12/20

Dates Test Represents: 10/13/2020 through 10/19/2020

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	95-013	Smelter Bay	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

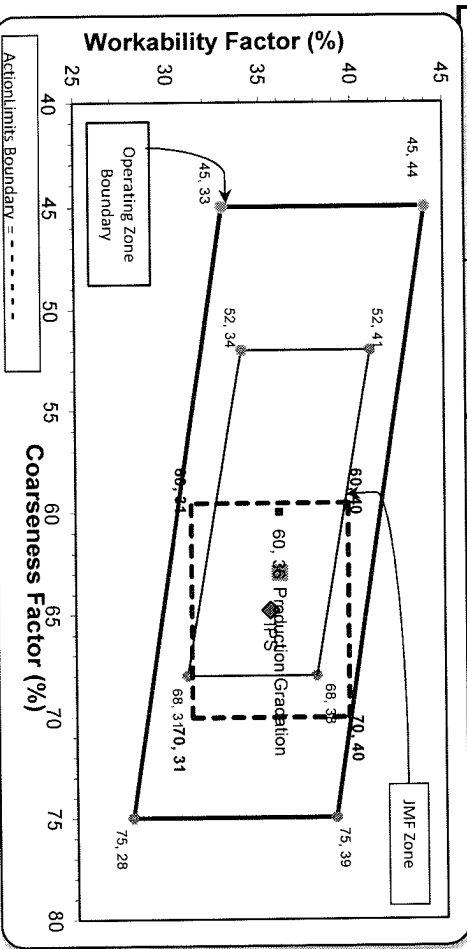
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.1	100.0	100.0	98.8	1.2	1.2
1"	34.1	100.0	100.0	79.6	19.2	20.4
3/4"	9.3	99.6	100.0	71.8	7.8	28.2
1/2"	4.4	85.1	100.0	66.0	5.9	34.0
3/8"	3.8	64.9	100.0	59.7	6.2	40.3
#4	2.8	20.3	96.9	44.8	14.9	55.2
#8	2.5	7.3	84.6	36.0	8.8	64.0
#16	2.4	4.3	68.7	28.9	7.1	71.1
#30	2.3	3.7	48.7	20.9	8.0	79.1
#50	2.2	3.3	23.5	10.9	10.0	89.1
#100	2.0	3.0	6.1	3.9	7.0	96.1
LBW	1.6	2.5	0.9	1.6	2.3	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: **63** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	% 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



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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____

Plant 958-JMT
Product 1022-2NS GR - Smelter Bay
Period: 10/11/2020 - 10/17/2020

Name/Title Doug Storey / QC Technician
Report Date 10/16/2020

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)	84.6	%	65-95
	#16 (1.18mm)	68.7	%	35-75
	#30 (.6mm)	48.7	%	20-55
	#50 (.3mm)	23.5	%	10-30
	#100 (.15mm)	6.1	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/11/2020 - 10/17/2020

Report Date 10/16/2020

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)	99.6	%	
	1/2" (12.5mm)	85.1	%	
	3/8" (9.5mm)	64.9	%	
	#4 (4.75mm)	20.3	%	
	#8 (2.36mm)	7.3	%	
	#16 (1.18mm)	4.3	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.3	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.5	%	0-3
	Total Moisture	3.7	%	

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 10/11/2020 - 10/17/2020

Report Date 10/16/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.1	%	
	1" (25mm)	34.1	%	
	3/4" (19mm)	9.3	%	
	1/2" (12.5mm)	4.4	%	
	3/8" (9.5mm)	3.8	%	
	#4 (4.75mm)	2.8	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	1.8	%	

Aggregate Optimization Chart

PLANT #: P-36

Contractor: _____

Sample Date: 10/12/20

Concrete Grade: P1M

Dates Test Represents: 10/13/2020 through 10/19/2020

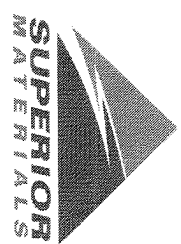
MDOT No.: _____

Aggr. Class	Pit #	Source	Weight (ss)	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	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"	98.5	100.0	100.0	99.5	0.5	0.5
1"	54.7	100.0	100.0	85.7	13.8	14.3
3/4"	20.7	99.1	100.0	74.7	11.0	25.3
1/2"	7.3	86.7	100.0	66.8	7.9	33.2
3/8"	5.3	68.8	100.0	60.9	5.9	39.1
#4	3.2	17.6	96.6	43.9	17.0	56.1
#8	2.7	6.0	84.6	35.7	8.2	64.3
#16	2.6	3.4	69.9	29.1	6.5	70.9
#30	2.5	2.9	49.3	20.9	8.2	79.1
#50	2.4	2.7	29.3	13.0	7.9	87.0
#100	2.2	2.5	8.7	4.8	8.2	95.2
LBW	1.8	2.0	1.1	1.6	3.2	98.4

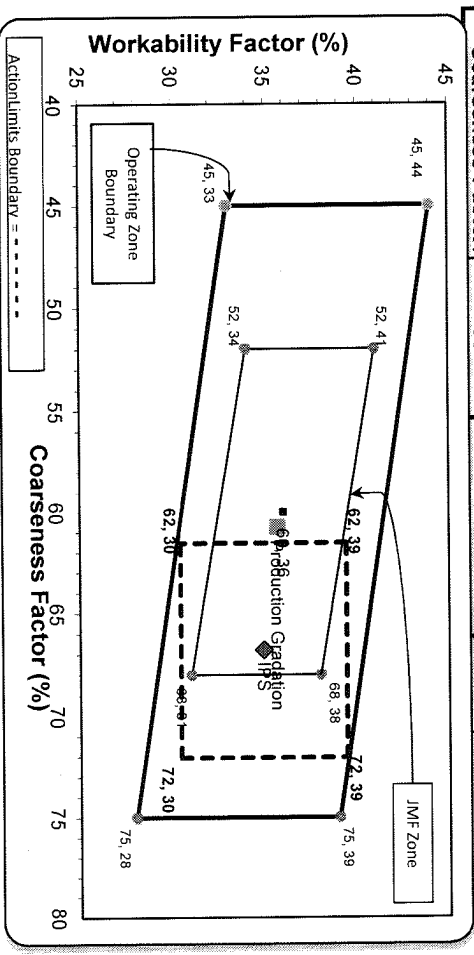
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max., #100 and #200 sieves.
 **% Retained must be at least 4% for each sieve except max.
 nom. max., #100 and #200 sieves.
 ***% Retained must be at least 8% for the 1" sieve when a 2" max. size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



Superior Materials, LLC
 30701 W. 10 Mile Rd.
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Production Gradation Batch Plant Gradations Aggregate Supplier Gradations
Coarseness Factor: 61 **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



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Period: 10/04/2020 - 10/10/2020

Name/Title Doug Storey / QC Technician

Report Date 10/09/2020

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.4	%	95-100
	#8 (2.36mm)	83.9	%	65-95
	#16 (1.18mm)	68.4	%	35-75
	#30 (.6mm)	47.9	%	20-55
	#50 (.3mm)	18.5	%	10-30
	#100 (.15mm)	6.3	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.70	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Period: 10/04/2020 - 10/10/2020

Name/Title Doug Storey / QC Technician

Report Date 10/09/2020

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)	98.7	%	
	1/2" (12.5mm)	84.5	%	
	3/8" (9.5mm)	64.8	%	
	#4 (4.75mm)	18.4	%	
	#8 (2.36mm)	6.3	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.0	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	3.26	%	



2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
Product 7919-COARSE AGG P1M LS
Period: 10/04/2020 - 10/10/2020

Name/Title Doug Storey / QC Technician
Report Date 10/09/2020

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.5	%	
	1" (25mm)	42.6	%	
	3/4" (19mm)	12.0	%	
	1/2" (12.5mm)	5.3	%	
	3/8" (9.5mm)	4.0	%	
	#4 (4.75mm)	2.6	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75µm)	1.2	%	0-2
	Total Moisture	2.25	%	