

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

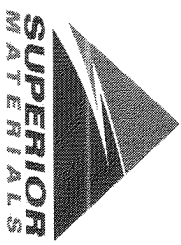
Sample Date: **3/8/21**

Dates Test Represents: **3/9/2021** through **3/15/2021**

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____



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

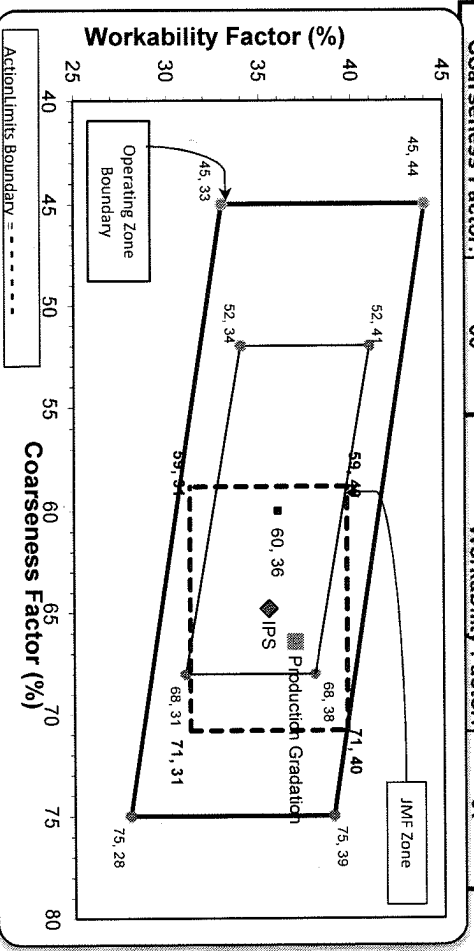
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	87.9	100.0	100.0	96.4	3.6	3.6
1"	25.8	100.0	100.0	77.8	18.6	22.2
3/4"	7.2	98.6	100.0	71.8	6.0	28.2
1/2"	3.8	78.6	100.0	64.9	6.9	35.1
3/8"	3.3	55.9	100.0	58.1	6.8	41.9
#4	2.7	13.8	97.0	44.3	13.7	55.7
#8	2.5	5.6	84.8	36.9	7.4	63.1
#16	2.3	4.2	68.9	30.0	6.9	70.0
#30	2.2	3.8	43.7	19.6	10.4	80.4
#50	2.0	3.2	18.7	9.2	10.4	90.8
#100	1.8	3.0	3.6	2.9	6.3	97.1
LBW	1.5	2.7	0.7	1.5	1.4	98.5

*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: **66** Workability Factor: **37**



Initial Production Sample (IPS)

Coarseness Factor:	36		
Workability Factor:	65		
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 S32-Superior JMT Product

7919-COARSE AGG P1M LS

Period: 03/07/2021 - 03/13/2021

Name/Title Doug Storey / QC Technician

Report Date 03/13/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	87.9	%	
	1" (25mm)	25.8	%	
	3/4" (19mm)	7.2	%	
	1/2" (12.5mm)	3.8	%	
	3/8" (9.5mm)	3.3	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	1.94	%	



Plant S32-Superior JMT Product

7920-INTERMED AGG P1M LS Period:

03/07/2021 - 03/13/2021

Name/Title Doug Storey / QC Technician

Report Date 03/13/2021

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)	78.6	%	
	3/8" (9.5mm)	55.9	%	
	#4 (4.75mm)	13.8	%	
	#8 (2.36mm)	5.6	%	
	#16 (1.18mm)	4.2	%	
	#30 (.6mm)	3.8	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75µm)	2.7	%	0-3
	Total Moisture	3.15	%	



Plant S32-Superior JMT

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	84.2	%	65-95
	#16 (1.18mm)	69.3	%	35-75
	#30 (.6mm)	48.0	%	20-55
	#50 (.3mm)	19.1	%	10-30
	#100 (.15mm)	3.3	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.34	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

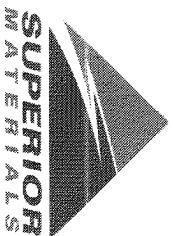
Contractor: _____

Sample Date: **3/8/21**

Concrete Grade: **P1M**

Dates Test Represents: **3/9/2021** through **3/15/2021**

MDOT No.: _____



Superior Materials, LLC
30701 W. 10 Mile Rd.
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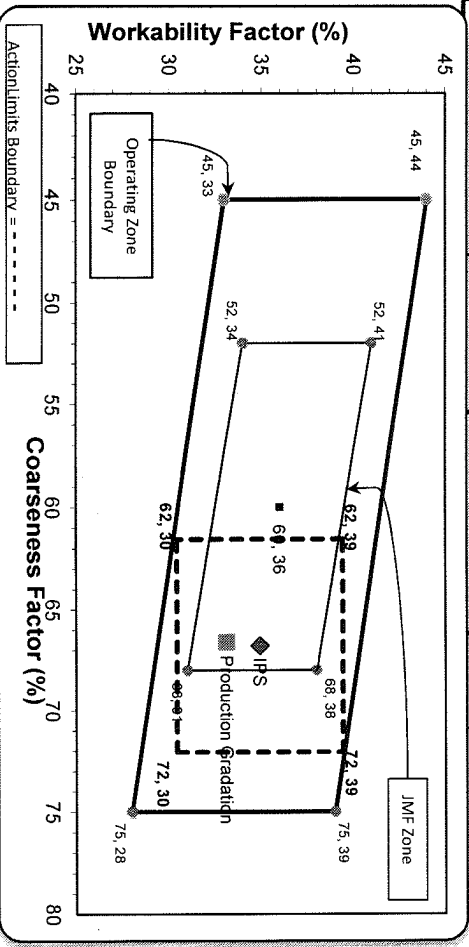
Agg. Class	Pit #	Source	Weight (SSD)	f ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	950	5.81	2.62	30.9
2NS	63-92	Grange Hill	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	58.2	100.0	100.0	87.5	12.5	12.5
3/4"	17.6	96.8	100.0	74.3	25.7	38.2
1/2"	4.2	73.4	100.0	63.1	36.9	75.1
3/8"	2.4	50.6	100.0	55.5	44.5	119.6
#4	2.3	11.8	97.3	42.4	57.6	177.2
#8	2.0	4.7	79.5	33.1	66.9	244.1
#16	1.8	3.5	62.4	26.0	74.0	318.1
#30	1.6	3.1	45.5	19.2	80.8	398.9
#50	1.4	2.8	21.7	9.8	90.2	509.1
#100	1.2	2.6	4.2	2.8	97.2	606.3
LBW	0.9	2.3	0.7	1.3	98.7	607.6

*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) Batch Plant Gradations Aggregate Supplier Gradations



Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	67	35	0.0	0.0
1.5"	67	35	0.0	0.0
1"	67	35	15.0	15.0
3/4"	67	35	27.9	42.9
1/2"	67	35	35.5	78.4
3/8"	67	35	43.5	121.9
#4	67	35	57.3	179.2
#8	67	35	65.1	244.3
#16	67	35	71.0	315.3
#30	67	35	79.0	394.3
#50	67	35	91.8	486.1
#100	67	35	98.4	584.5
LBW	67	35	99.3	683.8

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Superior Auburn Hills
 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: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	58.2	%	
	3/4" (19mm)	17.6	%	
	1/2" (12.5mm)	4.2	%	
	3/8" (9.5mm)	2.4	%	
	#4 (4.75mm)	2.3	%	
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75µm)	0.9	%	0-2
	Total Moisture	2.51	%	



Superior Auburn Hills
 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: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

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)	96.8	%	
	1/2" (12.5mm)	73.4	%	
	3/8" (9.5mm)	50.6	%	
	#4 (4.75mm)	11.8	%	
	#8 (2.36mm)	4.7	%	
	#16 (1.18mm)	3.5	%	
	#30 (.6mm)	3.1	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75µm)	2.3	%	0-3
	Total Moisture	5.28	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.3	%	95-100
	#8 (2.36mm)	79.5	%	65-95
	#16 (1.18mm)	62.4	%	35-75
	#30 (.6mm)	45.5	%	20-55
	#50 (.3mm)	21.7	%	10-30
	#100 (.15mm)	4.2	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.89		2.6-3
	Wash Loss (#200/75um)	0.7	%	0-3
	Total Moisture	3.29	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-02

Sample Date: 3/8/21

Dates Test Represents: 3/9/2021 through 3/15/2021

Concrete Grade: P1M

Contractor: _____

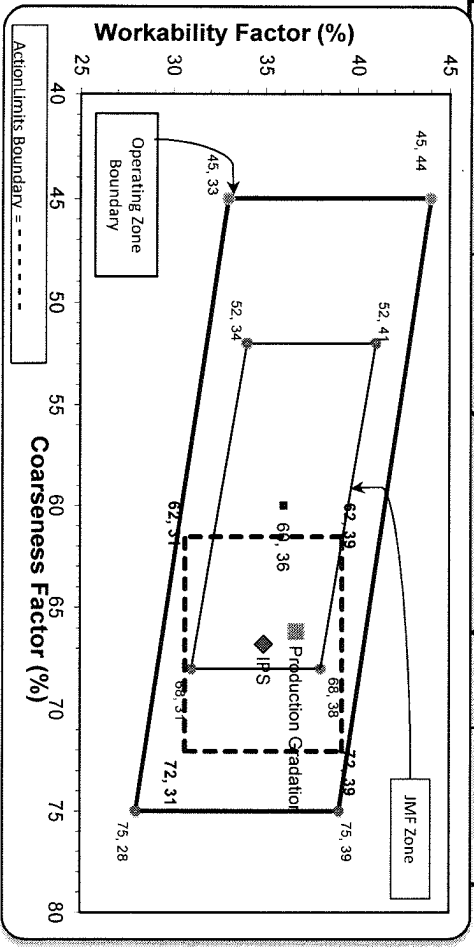
MDOT No.: _____

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	63-115	Ray Rd	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"	87.9	100.0	100.0	96.4	3.6	3.6
1"	25.8	100.0	100.0	77.8	18.6	22.2
3/4"	7.2	100.0	100.0	71.8	6.0	28.2
1/2"	3.8	78.6	100.0	64.9	6.9	35.1
3/8"	3.3	55.9	100.0	58.1	6.8	41.9
#4	2.7	13.8	97.0	44.3	13.7	55.7
#8	2.5	5.6	84.2	36.7	7.7	63.3
#16	2.3	4.2	69.3	30.1	6.5	69.9
#30	2.2	3.8	48.0	21.3	8.8	78.7
#50	2.0	3.2	19.1	9.3	12.0	90.7
#100	1.8	3.0	3.3	2.8	6.6	97.2
LBW	1.5	2.7	1.1	1.7	1.1	98.3

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 66 Workability Factor: 37



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"	72.3	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



*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 S02-Superior Hoover Product

7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	87.9	%	
	1" (25mm)	25.8	%	
	3/4" (19mm)	7.2	%	
	1/2" (12.5mm)	3.8	%	
	3/8" (9.5mm)	3.3	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	1.94	%	



Plant S02-Superior Hoover

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

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)	78.6	%	
	3/8" (9.5mm)	55.9	%	
	#4 (4.75mm)	13.8	%	
	#8 (2.36mm)	5.6	%	
	#16 (1.18mm)	4.2	%	
	#30 (.6mm)	3.8	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.7	%	0-3
	Total Moisture	3.15	%	



Plant S02-Superior Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 03/07/2021 - 03/13/2021

Report Date 03/13/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.0	%	95-100
	#8 (2.36mm)	84.2	%	65-95
	#16 (1.18mm)	69.3	%	35-75
	#30 (.6mm)	48.0	%	20-55
	#50 (.3mm)	19.1	%	10-30
	#100 (.15mm)	3.3	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.34	%	