

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Contractor: _____

Sample Date: 5/17/21

Concrete Grade: **P1M**

Dates Test Represents: 5/18/2021 through 5/24/2021

MDOT No.: _____

Aggr. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt						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"	97.4	100.0	100.0	99.1	0.9	0.9
1"	44.0	100.0	100.0	81.4	17.7	18.6
3/4"	10.5	99.1	100.0	70.0	11.4	30.0
1/2"	3.5	86.1	100.0	64.3	5.7	35.7
3/8"	2.6	64.1	100.0	58.3	6.0	41.7
#4	2.2	18.5	95.7	44.5	13.8	55.5
#8	2.1	4.8	82.0	35.3	9.2	64.7
#16	2.0	3.0	68.5	29.3	6.0	70.7
#30	1.9	2.6	48.0	20.9	8.5	79.1
#50	1.9	2.4	22.2	10.3	10.6	89.7
#100	1.8	2.2	6.2	3.7	6.6	96.3
LBW	1.6	1.6	1.6	1.6	2.1	98.4

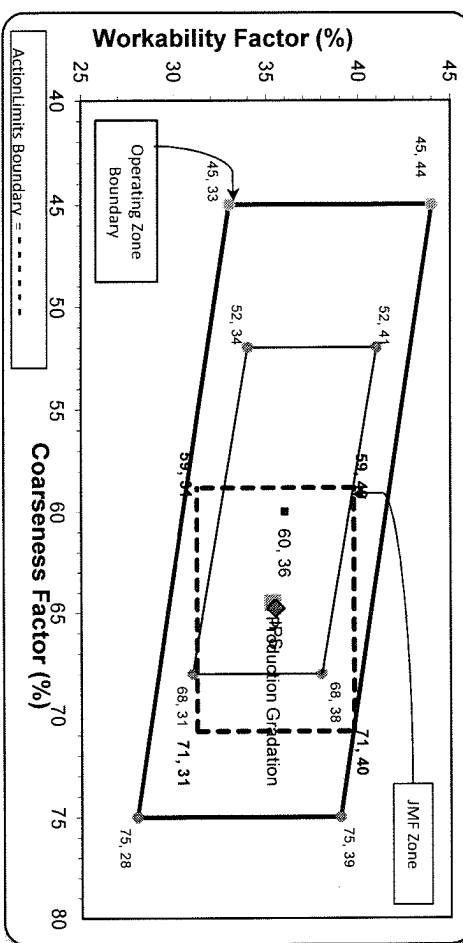
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

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

Initial Production Sample (IPS)
 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 1022-2NS GR - Smelter Bay
 Period: 05/16/2021 - 05/22/2021

Name/Title Doug Storey / QC Technician
 Report Date 05/21/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	82.0	%	65-95
	#16 (1.18mm)	68.5	%	35-75
	#30 (.6mm)	48.0	%	20-55
	#50 (.3mm)	22.2	%	10-30
	#100 (.15mm)	6.2	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	5.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/16/2021 - 05/22/2021

Report Date 05/21/2021

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)	99.1	%	
	1/2" (12.5mm)	86.1	%	
	3/8" (9.5mm)	64.1	%	
	#4 (4.75mm)	18.5	%	
	#8 (2.36mm)	4.8	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.4	%	

Edw. C. Levy Co.

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8911 W. Jefferson
Detroit, 48209
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Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/16/2021 - 05/22/2021

Report Date 05/19/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.4	%	
	1" (25mm)	44.0	%	
	3/4" (19mm)	10.5	%	
	1/2" (12.5mm)	3.5	%	
	3/8" (9.5mm)	2.6	%	
	#4 (4.75mm)	2.2	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.0	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

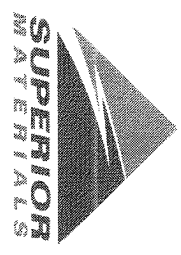
Contractor: _____

Sample Date: 5/17/21
Dates Test Represents: 5/18/2021 through 5/24/2021
Concrete Grade: P1M

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1050	6.42	2.62	34.2
IA	71-47	Presque Isle	820	5.02	2.62	26.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt			3070	18.70		100.0

Verify this number is 100%



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

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"	75.5	100.0	100.0	91.6	8.4	8.4
3/4"	24.0	95.2	100.0	72.7	18.9	27.3
1/2"	6.4	69.2	100.0	59.8	13.0	40.2
3/8"	4.3	46.0	100.0	52.8	6.9	47.2
#4	3.0	6.9	97.2	40.9	12.0	59.1
#8	2.9	3.3	83.9	34.7	6.2	65.3
#16	2.8	2.6	68.4	28.4	6.3	71.6
#30	2.8	2.4	49.9	21.1	7.3	78.9
#50	2.7	2.3	26.1	11.7	9.4	88.3
#100	2.5	2.1	4.8	3.3	8.4	96.7
LBW	1.9	1.6	0.6	1.3	2.0	98.7

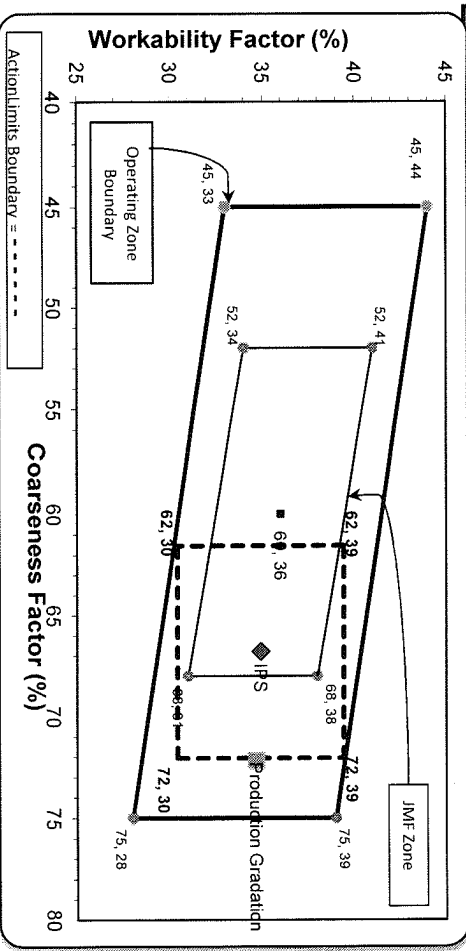
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 **Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 ***Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: 72 **Workability Factor:** 35

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: _____



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: 05/16/2021 - 05/22/2021

Report Date 05/19/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.2	%	95-100
	#8 (2.36mm)	83.9	%	65-95
	#16 (1.18mm)	68.4	%	35-75
	#30 (.6mm)	49.9	%	20-55
	#50 (.3mm)	26.1	%	10-30
	#100 (.15mm)	4.8	%	0-10
	#200 (75µm)	0.7	%	
	FM	2.70		2.6-3
	Wash Loss (#200/75um)	0.6	%	0-3
	Total Moisture	3.67	%	



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: 05/16/2021 - 05/22/2021

Report Date 05/19/2021

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)	95.2	%	
	1/2" (12.5mm)	69.2	%	
	3/8" (9.5mm)	46.0	%	
	#4 (4.75mm)	6.9	%	
	#8 (2.36mm)	3.3	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	2.37	%	



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: 05/16/2021 - 05/22/2021

Report Date 05/19/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	75.5	%	
	3/4" (19mm)	24.0	%	
	1/2" (12.5mm)	6.4	%	
	3/8" (9.5mm)	4.3	%	
	#4 (4.75mm)	3.0	%	
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	1.43	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

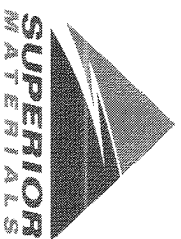
Sample Date: **5/17/21**

Dates Test Represents: **5/18/2021** through **5/24/2021**

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	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
NNS	44-051	Krake Willis Rd	1250	7.56	2.65	40.7
Total Wt			3070			100.0

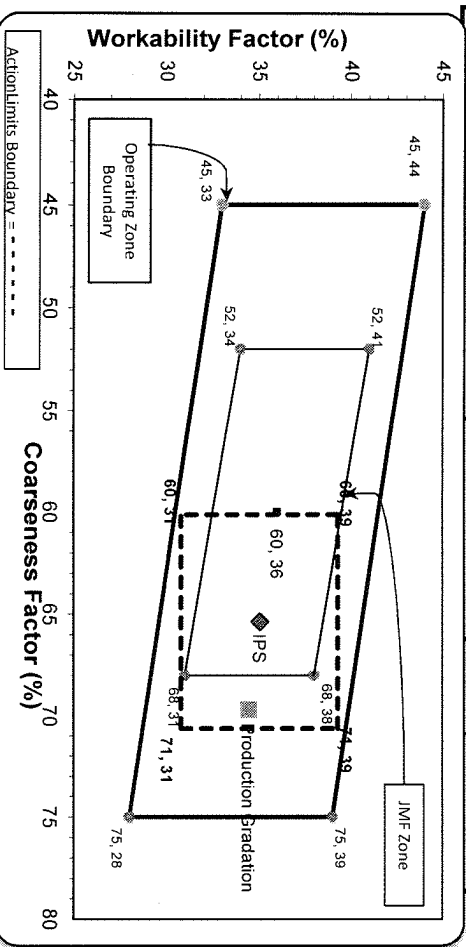
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.6	100.0	100.0	99.5	0.5	0.5
1"	54.9	100.0	100.0	84.3	15.2	15.7
3/4"	17.1	97.8	100.0	70.6	13.7	29.4
1/2"	3.6	76.2	100.0	60.6	10.0	39.4
3/8"	2.6	52.0	100.0	54.3	6.3	45.7
#4	2.0	9.9	96.9	42.6	11.8	57.4
#8	1.9	4.2	80.5	34.5	8.1	65.5
#16	1.9	2.9	65.3	28.0	6.5	72.0
#30	1.9	2.6	50.4	21.8	6.1	78.2
#50	1.8	2.5	27.6	12.5	9.3	87.5
#100	1.7	2.3	8.0	4.4	8.1	95.6
LBW	1.2	1.7	1.6	1.5	2.9	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. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **70** Workability Factor: **34**



Sieve	Coarseness Factor:	Workability Factor:
2"	65	35
1.5"	99.6	0.4
1"	83.9	15.7
3/4"	74.1	9.8
1/2"	64.3	9.7
3/8"	57.5	6.8
#4	44.5	13.1
#8	35.1	9.4
#16	27.9	7.2
#30	21.7	6.2
#50	12.6	9.1
#100	3.5	9.1
LBW	1.2	2.4

PREPARED BY:
SM, LLC Technical Service

Approved By:



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/16/2021 - 05/22/2021

Report Date 05/19/2021

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)	80.5	%	65-95
	#16 (1.18mm)	65.3	%	35-75
	#30 (.6mm)	50.4	%	20-55
	#50 (.3mm)	27.6	%	10-30
	#100 (.15mm)	8.0	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	4.18	%	



Plant S39-Superior Sterling Heights

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/16/2021 - 05/22/2021

Report Date 05/19/2021

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)	97.8	%	
	1/2" (12.5mm)	76.2	%	
	3/8" (9.5mm)	52.0	%	
	#4 (4.75mm)	9.9	%	
	#8 (2.36mm)	4.2	%	
	#16 (1.18mm)	2.9	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	1.93	%	



Plant S39-Superior Sterling Heights

Product 7919-COARSE AGG P1M LS

Period: 05/16/2021 - 05/22/2021

Name/Title Doug Storey / QC Technician

Report Date 05/19/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.6	%	
	1" (25mm)	54.9	%	
	3/4" (19mm)	17.1	%	
	1/2" (12.5mm)	3.6	%	
	3/8" (9.5mm)	2.6	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	0.22	%	