

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: 5/10/21

Dates Test Represents: 5/11/2021 through 5/17/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %	
CA	71-47	Presque Isle	800	4.89	2.62	26.1	
IA	71-47	Presque Isle	1020	6.24	2.62	33.7	
2NS	95-013	Smeller Bay	1250	7.56	2.65	40.7	
Total Wt						3070	100.0

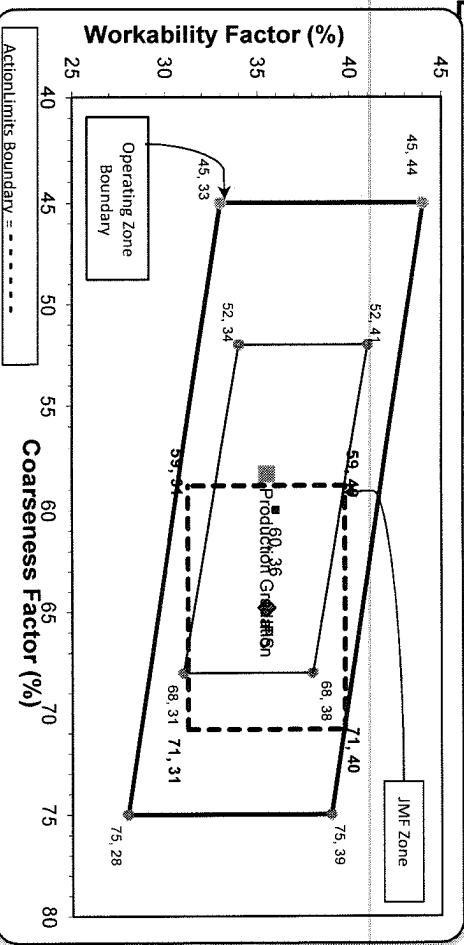
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Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.7	100.0	100.0	99.1	0.9	0.9
1"	43.1	100.0	100.0	85.2	14.8	14.8
3/4"	10.0	99.0	100.0	76.2	9.0	23.8
1/2"	2.9	85.6	100.0	69.9	6.3	30.1
3/8"	2.3	63.6	100.0	62.4	7.5	37.6
#4	1.9	17.3	95.8	45.2	17.2	54.8
#8	1.8	4.5	82.4	35.5	9.7	64.5
#16	1.8	2.6	65.6	28.0	7.5	72.0
#30	1.7	2.2	47.2	20.4	7.7	79.6
#50	1.7	2.1	21.4	9.9	10.5	90.1
#100	1.6	1.9	4.8	3.0	6.9	97.0
LBW	1.3	1.4	1.3	1.3	1.7	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.

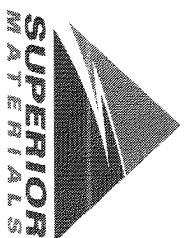
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **58** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	65	36	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

Name/Title Doug Storey / QC Technician

Period: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.8	%	95-100
	#8 (2.36mm)	82.4	%	65-95
	#16 (1.18mm)	65.6	%	35-75
	#30 (.6mm)	47.2	%	20-55
	#50 (.3mm)	21.4	%	10-30
	#100 (.15mm)	4.8	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.83		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	6.0	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

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)	99.0	%	
	1/2" (12.5mm)	85.6	%	
	3/8" (9.5mm)	63.6	%	
	#4 (4.75mm)	17.3	%	
	#8 (2.36mm)	4.5	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75µm)	1.4	%	0-3
	Total Moisture	3.7	%	

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.7	%	
	1" (25mm)	43.1	%	
	3/4" (19mm)	10.0	%	
	1/2" (12.5mm)	2.9	%	
	3/8" (9.5mm)	2.3	%	
	#4 (4.75mm)	1.9	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-2
	Total Moisture	1.7	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

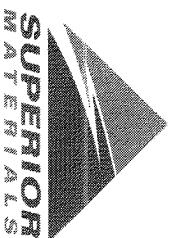
Sample Date: 5/10/21

Dates Test Represents: 5/11/2021 through 5/17/2021

Concrete Grade: P1M

Contractor: _____

MDOT No.: _____



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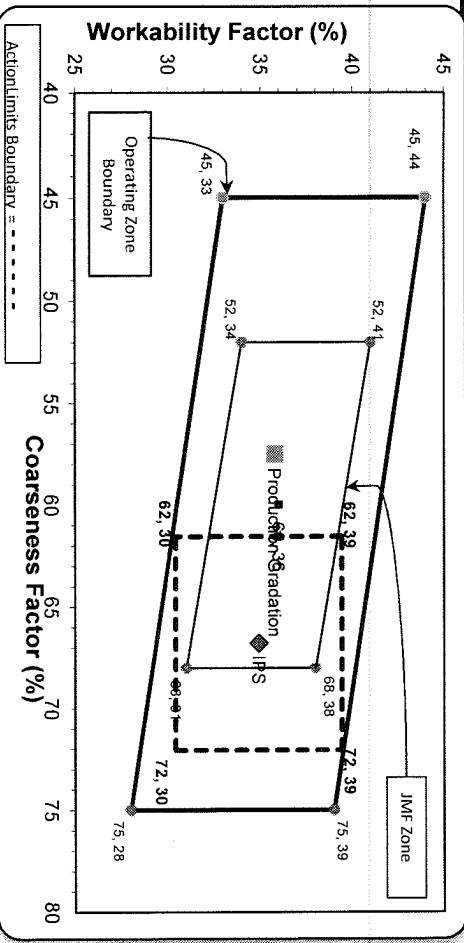
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	820	5.02	2.62	26.7
IA	71-47	Presque Isle	1050	6.42	2.62	34.2
ZNS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	88.0	100.0	100.0	96.8	3.2	3.2
3/4"	42.5	98.3	100.0	84.1	15.9	15.9
1/2"	12.2	82.8	100.0	70.7	29.3	29.3
3/8"	7.5	64.3	100.0	63.1	36.9	36.9
#4	4.1	17.8	97.5	45.3	54.7	54.7
#8	3.2	5.6	84.5	35.8	64.2	64.2
#16	2.7	3.2	69.5	29.0	71.0	71.0
#30	2.5	2.7	50.4	21.3	78.7	78.7
#50	2.3	2.5	22.5	10.3	89.7	89.7
#100	2.0	2.3	4.3	3.0	97.0	97.0
LBW	1.2	1.8	1.0	1.3	98.7	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

Coarseness Factor: 58 Workability Factor: 36



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	67	35	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: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.5	%	95-100
	#8 (2.36mm)	84.5	%	65-95
	#16 (1.18mm)	69.5	%	35-75
	#30 (.6mm)	50.4	%	20-55
	#50 (.3mm)	22.5	%	10-30
	#100 (.15mm)	4.3	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.03	%	



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Plant S36-Superior Auburn Hills
 Product 7920-INTERMED AGG P1M LS
 Period: 05/09/2021 - 05/15/2021

Name/Title Doug Storey / QC Technician
 Report Date 05/14/2021

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)	98.3	%	
	1/2" (12.5mm)	82.8	%	
	3/8" (9.5mm)	64.3	%	
	#4 (4.75mm)	17.8	%	
	#8 (2.36mm)	5.6	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.7	%	
	#50 (.3mm)	2.5	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	3.79	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
Product 7919-COARSE AGG P1M LS
Period: 05/09/2021 - 05/15/2021

Name/Title Doug Storey / QC Technician
Report Date 05/14/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	88.0	%	
	3/4" (19mm)	42.5	%	
	1/2" (12.5mm)	12.2	%	
	3/8" (9.5mm)	7.5	%	
	#4 (4.75mm)	4.1	%	
	#8 (2.36mm)	3.2	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	3.40	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

Sample Date: 5/10/21

Dates Test Represents: 5/11/2021 through 5/17/2021

Concrete Grade: **P1M**

Contractor: _____

MDOT No.: _____

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	18.69		100.0

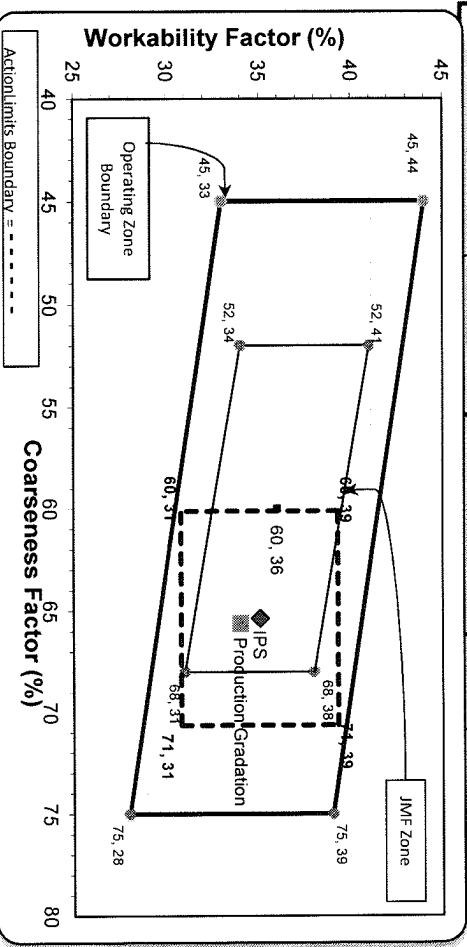
Verify this number is 100%

Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.7	100.0	100.0	99.5	0.5	0.5
1"	62.7	100.0	100.0	87.0	12.5	13.0
3/4"	19.2	100.0	100.0	71.8	15.2	28.2
1/2"	5.4	82.0	100.0	62.6	9.2	37.4
3/8"	3.9	59.8	100.0	56.7	5.9	43.3
#4	2.7	12.3	96.9	43.4	13.3	56.6
#8	2.5	4.8	78.5	34.0	9.4	66.0
#16	2.4	3.0	63.3	27.3	6.7	72.7
#30	2.3	2.6	47.9	20.9	6.4	79.1
#50	2.2	2.4	25.3	11.7	9.3	88.3
#100	2.0	2.2	6.9	4.0	7.6	96.0
LBW	1.6	1.8	1.3	1.5	2.5	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: **34**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	65	35	0.0	0.0
1.5"			0.4	0.4
1"			15.7	16.1
3/4"			9.8	25.9
1/2"			9.7	35.7
3/8"			6.8	42.5
#4			13.1	55.5
#8			9.4	64.9
#16			7.2	72.1
#30			6.2	78.3
#50			9.1	87.4
#100			9.1	96.5
LBW			2.4	98.8



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PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

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)	78.5	%	65-95
	#16 (1.18mm)	63.3	%	35-75
	#30 (.6mm)	47.9	%	20-55
	#50 (.3mm)	25.3	%	10-30
	#100 (.15mm)	6.9	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.81		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.80	%	



Plant S39-Superior Sterling Heights

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

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)	100.0	%	
	1/2" (12.5mm)	82.0	%	
	3/8" (9.5mm)	59.8	%	
	#4 (4.75mm)	12.3	%	
	#8 (2.36mm)	4.8	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	2.38	%	



Plant S39-Superior Sterling Heights

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 05/09/2021 - 05/15/2021

Report Date 05/14/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.7	%	
	1" (25mm)	62.7	%	
	3/4" (19mm)	19.2	%	
	1/2" (12.5mm)	5.4	%	
	3/8" (9.5mm)	3.9	%	
	#4 (4.75mm)	2.7	%	
	#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 (#200/75µm)	1.6	%	0-2
	Total Moisture	0.38	%	