

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Contractor: _____

Sample Date: **7/18/22**

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: **7/19/2022** through **7/25/2022**

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	900	5.50	2.62	29.3
IA	71-47	Presque Isle	920	5.63	2.62	30.0
ZNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt						18.69
						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"	98.3	100.0	100.0	99.5	0.5	0.5
1"	41.7	100.0	100.0	82.9	16.6	17.1
3/4"	11.6	97.0	100.0	73.2	9.7	26.8
1/2"	4.3	71.9	100.0	63.5	9.7	36.5
3/8"	3.0	44.7	100.0	55.0	8.5	45.0
#4	2.2	10.8	96.0	43.0	12.0	57.0
#8	2.1	5.2	82.3	35.7	7.3	64.3
#16	2.0	3.8	66.8	28.9	6.8	71.1
#30	1.9	3.3	47.7	21.0	8.0	79.0
#50	1.8	3.0	23.3	10.9	10.1	89.1
#100	1.6	2.7	7.2	4.2	6.7	95.8
LBW	1.2	2.0	1.3	1.5	2.7	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.

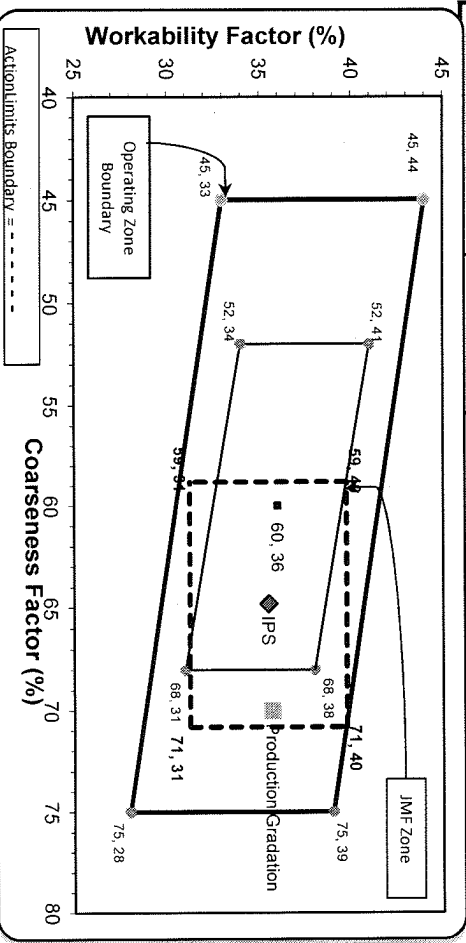


Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **70** Workability Factor: **36**

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: 07/17/2022 - 07/23/2022

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2022

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)	82.3	%	65-95
	#16 (1.18mm)	66.8	%	35-75
	#30 (.6mm)	47.7	%	20-55
	#50 (.3mm)	23.3	%	10-30
	#100 (.15mm)	7.2	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.77		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 07/17/2022 - 07/23/2022

Report Date 07/22/2022

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)	97.0	%	
	1/2" (12.5mm)	71.9	%	
	3/8" (9.5mm)	44.7	%	
	#4 (4.75mm)	10.8	%	
	#8 (2.36mm)	5.2	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.0	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	35.1	%	

Edw. C. Levy Co.

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Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 07/17/2022 - 07/23/2022

Report Date 07/22/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.3	%	
	1" (25mm)	41.7	%	
	3/4" (19mm)	11.6	%	
	1/2" (12.5mm)	4.3	%	
	3/8" (9.5mm)	3.0	%	
	#4 (4.75mm)	2.2	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.2	%	0-2
	Total Moisture	0.3	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

Sample Date: **7/18/22**

Dates Test Represents: **7/19/2022** through **7/25/2022**

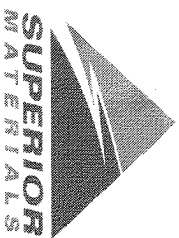
Concrete Grade: **P1M, 3500HP**

Contractor: _____

MIDOT No.: _____

Agg. 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	44-051	Krake Willis Rd	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"	98.1	100.0	100.0	99.4	0.6	0.6
1"	45.2	100.0	100.0	81.8	17.6	18.2
3/4"	15.4	98.3	100.0	71.4	10.3	28.6
1/2"	5.5	82.3	100.0	64.0	7.5	36.0
3/8"	2.9	64.0	100.0	58.4	5.6	41.6
#4	2.0	23.8	97.3	46.5	11.9	53.5
#8	1.9	8.3	81.1	35.8	10.7	64.2
#16	1.9	5.1	67.5	29.4	6.4	70.6
#30	1.8	4.3	51.4	22.6	6.8	77.4
#50	1.8	3.9	26.2	12.3	10.4	87.7
#100	1.7	3.5	7.7	4.6	7.7	95.4
LBW	1.4	2.9	1.5	1.8	2.8	98.2

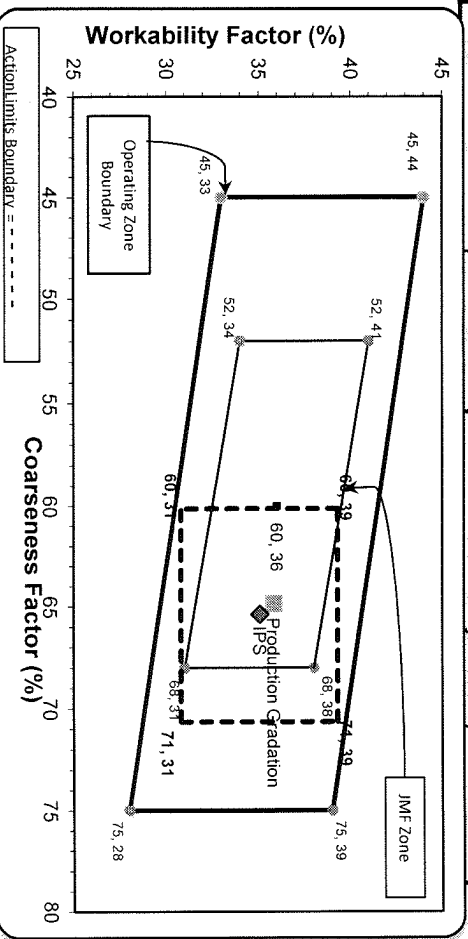


Superior Materials, LLC
 30701 W. 10 Mile Rd.
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 Farmington Hills, MI 48336

*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: **65** Workability Factor: **36**



Initial Production Sample (IPS)

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	0.4	0.4
1"	83.9	15.7	16.1
3/4"	74.1	9.8	25.9
1/2"	64.3	9.7	35.7
3/8"	57.5	6.8	42.5
#4	44.5	13.1	55.5
#8	35.1	9.4	64.9
#16	27.9	7.2	72.1
#30	21.7	6.2	78.3
#50	12.6	9.1	87.4
#100	3.5	9.1	96.5
LBW	1.2	2.4	98.8

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 07/17/2022 - 07/23/2022

Report Date 07/22/2022

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)	81.1	%	65-95
	#16 (1.18mm)	67.5	%	35-75
	#30 (.6mm)	51.4	%	20-55
	#50 (.3mm)	26.2	%	10-30
	#100 (.15mm)	7.7	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	5.62	%	



Plant S39-Superior Sterling Heights
 Product 7920-INTERMED AGG P1M LS
 Period: 07/17/2022 - 07/23/2022

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2022

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)	82.3	%	
	3/8" (9.5mm)	64.0	%	
	#4 (4.75mm)	23.8	%	
	#8 (2.36mm)	8.3	%	
	#16 (1.18mm)	5.1	%	
	#30 (.6mm)	4.3	%	
	#50 (.3mm)	3.9	%	
	#100 (.15mm)	3.5	%	
	#200 (75µm)	3.0	%	
	Wash Loss (#200/75um)	2.9	%	0-3
	Total Moisture	4.28	%	



Plant S39-Superior Sterling Heights

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 07/17/2022 - 07/23/2022

Report Date 07/22/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.1	%	
	1" (25mm)	45.2	%	
	3/4" (19mm)	15.4	%	
	1/2" (12.5mm)	5.5	%	
	3/8" (9.5mm)	2.9	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75µm)	1.4	%	0-2
	Total Moisture	1.99	%	