

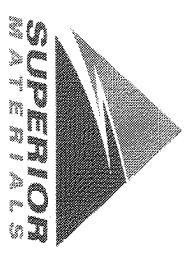
Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **8/1/22**
 Dates Test Represents: **8/2/2022** through **8/8/2022**
 Concrete Grade: **P1M, 3500HP**

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	900	5.50	2.62	29.3
IA	71-47	Presque Isle	920	5.63	2.62	30.0
NNS	95-013	Smelter Bay	1250	7.56	2.65	40.7
			Total Wt.	3070	18.69	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"	97.0	100.0	100.0	99.1	0.9	0.9
1"	44.2	100.0	100.0	83.6	15.5	16.4
3/4"	10.6	97.8	100.0	73.1	10.5	26.9
1/2"	3.4	73.0	100.0	63.6	9.5	36.4
3/8"	2.6	47.3	100.0	55.7	7.9	44.3
#4	2.0	9.4	96.8	42.8	12.8	57.2
#8	1.9	3.3	84.7	36.0	6.8	64.0
#16	1.8	2.4	69.2	29.4	6.6	70.6
#30	1.7	2.2	49.9	21.5	7.9	78.5
#50	1.7	2.0	24.5	11.1	10.4	88.9
#100	1.5	1.9	7.4	4.0	7.1	96.0
LBW	1.3	1.7	1.6	1.5	2.5	98.5

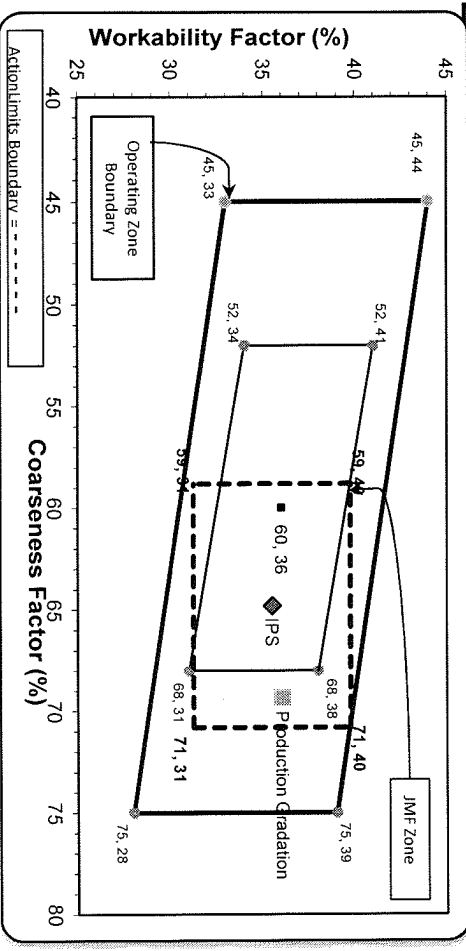
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **69** 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: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.8	%	95-100
	#8 (2.36mm)	84.7	%	65-95
	#16 (1.18mm)	69.2	%	35-75
	#30 (.6mm)	49.9	%	20-55
	#50 (.3mm)	24.5	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.4	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 07/31/2022 - 08/06/2022

Report Date 08/05/2022

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)	97.8	%	
	1/2" (12.5mm)	73.0	%	
	3/8" (9.5mm)	47.3	%	
	#4 (4.75mm)	9.4	%	
	#8 (2.36mm)	3.3	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.5	%	

Plant 958-JMT
 Product 7919-COARSE AGG P1M LS PI
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.0	%	
	1" (25mm)	44.2	%	
	3/4" (19mm)	10.6	%	
	1/2" (12.5mm)	3.4	%	
	3/8" (9.5mm)	2.6	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	1.9	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.7	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.5	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.3	%	0-2

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 8/1/22

Dates Test Represents: 8/2/2022 through 8/8/2022

Concrete Grade: P1M, 3500HP

Contractor: _____

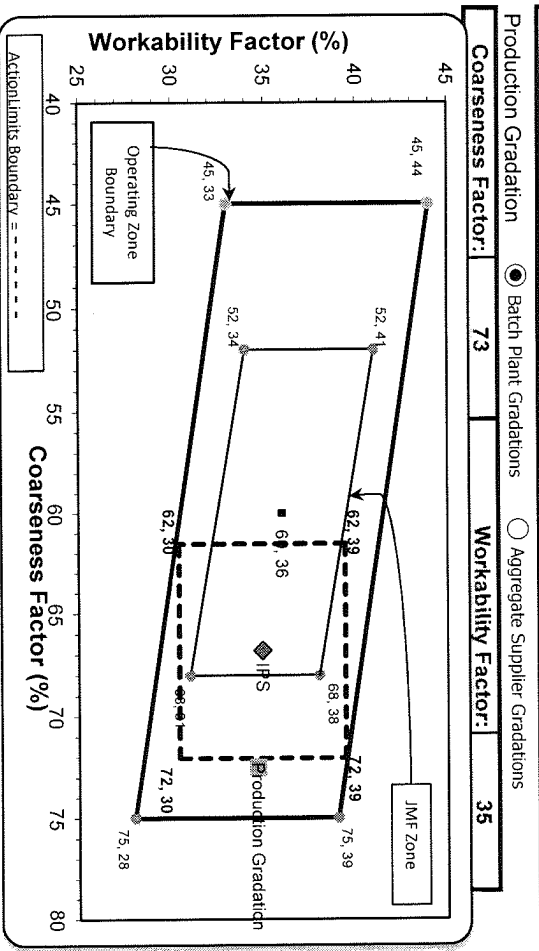
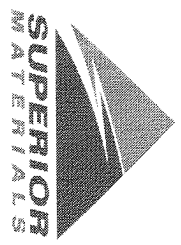
MDOT No.: _____

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	970	5.93	2.62	31.6
ZNS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt:						100.0
						18.70

Sieve	CA	IA	ZNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.1	100.0	100.0	98.3	1.7	1.7
1"	33.8	100.0	100.0	80.6	17.7	19.4
3/4"	7.3	96.5	100.0	71.7	8.9	28.3
1/2"	2.8	66.8	100.0	61.0	10.7	39.0
3/8"	2.2	40.8	100.0	52.6	8.4	47.4
#4	1.9	8.6	97.6	41.4	11.2	58.6
#8	1.8	3.6	84.4	34.7	6.8	65.3
#16	1.8	2.7	70.2	28.8	5.8	71.2
#30	1.8	2.4	53.4	22.2	6.7	77.8
#50	1.7	2.3	24.6	10.8	11.3	89.2
#100	1.6	2.2	5.1	3.2	7.7	96.8
LBW	1.3	1.9	1.0	1.4	1.8	98.6

*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.

Superior Materials, LLC
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 Suite 500
 Farmington Hills, MI 48336



Production Gradation: Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 73 Workability Factor: 35

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

Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician

Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.6	%	95-100
	#8 (2.36mm)	84.4	%	65-95
	#16 (1.18mm)	70.2	%	35-75
	#30 (.6mm)	53.4	%	20-55
	#50 (.3mm)	24.6	%	10-30
	#100 (.15mm)	5.1	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	3.43	%	



Superior Auburn Hills
 2470 Auburn Road
 Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
 Product 7920-INTERMED AGG P1M LS
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

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)	96.5	%	
	1/2" (12.5mm)	66.8	%	
	3/8" (9.5mm)	40.8	%	
	#4 (4.75mm)	8.6	%	
	#8 (2.36mm)	3.6	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	2.48	%	



Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills
Product 7919-COARSE AGG P1M LS
Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.1	%	
	1" (25mm)	33.8	%	
	3/4" (19mm)	7.3	%	
	1/2" (12.5mm)	2.8	%	
	3/8" (9.5mm)	2.2	%	
	#4 (4.75mm)	1.9	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.8	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.4	%	
	Wash Loss (#200/75um)	1.3	%	0-2

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-39**

Sample Date: **8/1/22**

Dates Test Represents: **8/2/2022** through **8/8/2022**

Concrete Grade: **P1M, 3500HP**

Contractor: _____

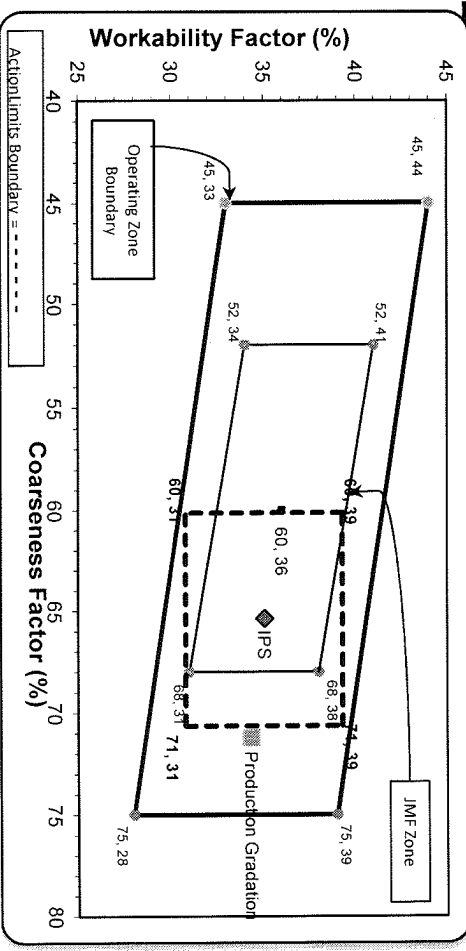
MDOT No.: _____

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						100.0
Total Wt						3070
Total Wt						18.69

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.8	100.0	100.0	99.6	0.4	0.4
1"	57.5	100.0	100.0	85.9	13.7	14.1
3/4"	22.5	99.4	100.0	74.1	11.8	25.9
1/2"	3.9	73.7	100.0	61.2	12.9	38.8
3/8"	2.4	45.0	100.0	53.2	8.0	46.8
#4	2.2	9.1	96.6	42.4	10.8	57.6
#8	2.2	3.8	80.1	34.3	8.1	65.7
#16	2.1	2.8	65.5	28.1	6.2	71.9
#30	2.1	2.5	49.5	21.5	6.6	78.5
#50	2.0	2.3	25.1	11.5	10.0	88.5
#100	1.9	2.2	7.4	4.2	7.3	95.8
LBW	1.5	1.8	1.6	1.6	2.6	98.4

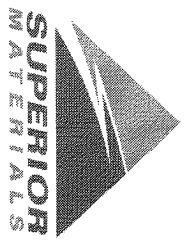
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **71** Workability Factor: **34**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	Cumulative % Passing	% Retained	Cumulative % Retained
2"	65	35	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



Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
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.

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights
 Product 1022-2NS GR
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.6	%	95-100
	#8 (2.36mm)	80.1	%	65-95
	#16 (1.18mm)	65.5	%	35-75
	#30 (.6mm)	49.5	%	20-55
	#50 (.3mm)	25.1	%	10-30
	#100 (.15mm)	7.4	%	0-10
	#200 (75µm)	2.0	%	
	FM	2.76		2.6-3
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	3.69	%	



Plant S39-Superior Sterling Heights
 Product 7920-INTERMED AGG P1M LS
 Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
 Report Date 08/05/2022

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)	99.4	%	
	1/2" (12.5mm)	73.7	%	
	3/8" (9.5mm)	45.0	%	
	#4 (4.75mm)	9.1	%	
	#8 (2.36mm)	3.8	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-3
	Total Moisture	1.04	%	



Plant S39-Superior Sterling Heights
Product 7919-COARSE AGG P1M LS
Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician
Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.8	%	
	1" (25mm)	57.5	%	
	3/4" (19mm)	22.5	%	
	1/2" (12.5mm)	3.9	%	
	3/8" (9.5mm)	2.4	%	
	#4 (4.75mm)	2.2	%	
	#8 (2.36mm)	2.2	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	1.33	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-101**

Sample Date: **8/1/22**

Dates Test Represents: **8/2/2022** through **8/8/2022**

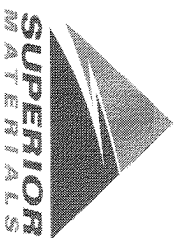
Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Cumulative Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
NNS	75-051	Mid Michigan	1200	7.23	2.66	39.1
Total Wt						18.67
						100.0

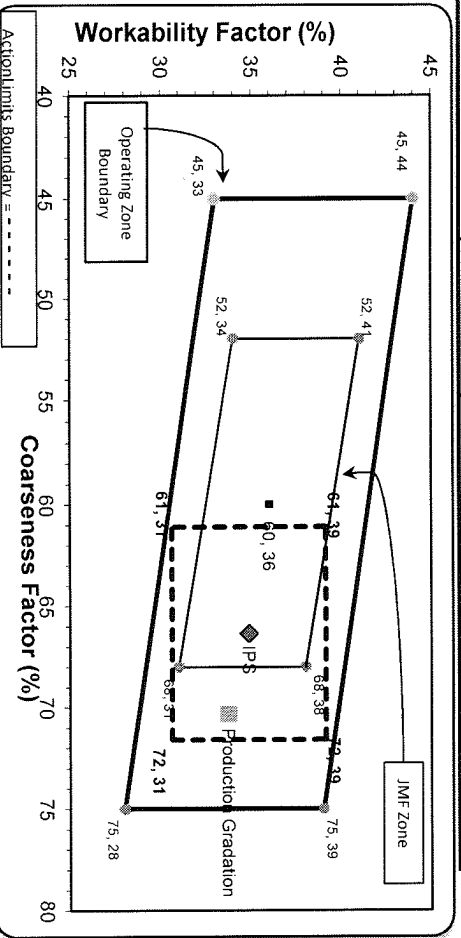
Sieve	CA	IA	NNS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	91.7	100.0	100.0	97.1	2.9	2.9
1"	23.7	100.0	100.0	73.4	23.7	26.6
3/4"	3.8	97.3	100.0	65.8	7.6	34.2
1/2"	1.6	79.0	100.0	60.2	5.5	39.8
3/8"	1.6	52.7	100.0	53.4	6.9	46.6
#4	1.6	10.3	98.4	41.7	11.7	58.3
#8	1.5	4.6	81.9	33.7	8.0	66.3
#16	1.5	3.8	65.0	26.9	6.8	73.1
#30	1.5	3.6	47.4	20.0	6.9	80.0
#50	1.4	3.2	22.4	10.1	9.9	89.9
#100	1.2	2.5	5.8	3.3	6.7	96.7
LBW	1.0	1.9	1.1	1.3	2.1	98.7



Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 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: **70** Workability Factor: **34**



Sieve	Coarseness Factor	Workability Factor	% Cumulative Passing	% Retained	% Cumulative Retained
2"	66	35	100.0	0.0	0.0
1.5"			99.6	0.4	0.4
1"			84.3	15.3	15.7
3/4"			74.8	9.6	25.2
1/2"			64.3	10.4	35.7
3/8"			56.8	7.5	43.2
#4			43.0	13.8	57.0
#8			34.9	8.1	65.1
#16			26.4	8.5	73.6
#30			19.9	6.5	80.1
#50			10.4	9.5	89.6
#100			3.4	7.0	96.6
LBW			1.2	2.2	98.8

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S101-Superior Mount Clemens

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 07/31/2022 - 08/06/2022

Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.4	%	95-100
	#8 (2.36mm)	81.9	%	65-95
	#16 (1.18mm)	65.0	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	22.4	%	10-30
	#100 (.15mm)	5.8	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.79		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	2.40	%	



Plant S101-Superior Mount Clemens

Product 7920-INTERMED AGG P1M LS

Period: 07/31/2022 - 08/06/2022

Name/Title Doug Storey / QC Technician

Report Date 08/05/2022

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)	97.3	%	
	1/2" (12.5mm)	79.0	%	
	3/8" (9.5mm)	52.7	%	
	#4 (4.75mm)	10.3	%	
	#8 (2.36mm)	4.6	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.6	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.9	%	0-3
	Total Moisture	0.44	%	



Plant S101-Superior Mount Clemens

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 07/31/2022 - 08/06/2022

Report Date 08/05/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	91.7	%	
	1" (25mm)	23.7	%	
	3/4" (19mm)	3.8	%	
	1/2" (12.5mm)	1.6	%	
	3/8" (9.5mm)	1.6	%	
	#4 (4.75mm)	1.6	%	
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.2	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75µm)	1.0	%	0-2
	Total Moisture	0.07	%	