

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P11**

Sample Date: 6/19/23

Dates Test Represents: 6/20/2023 through 6/26/2023

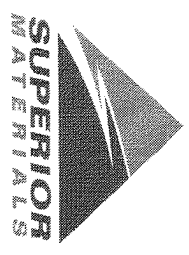
Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____

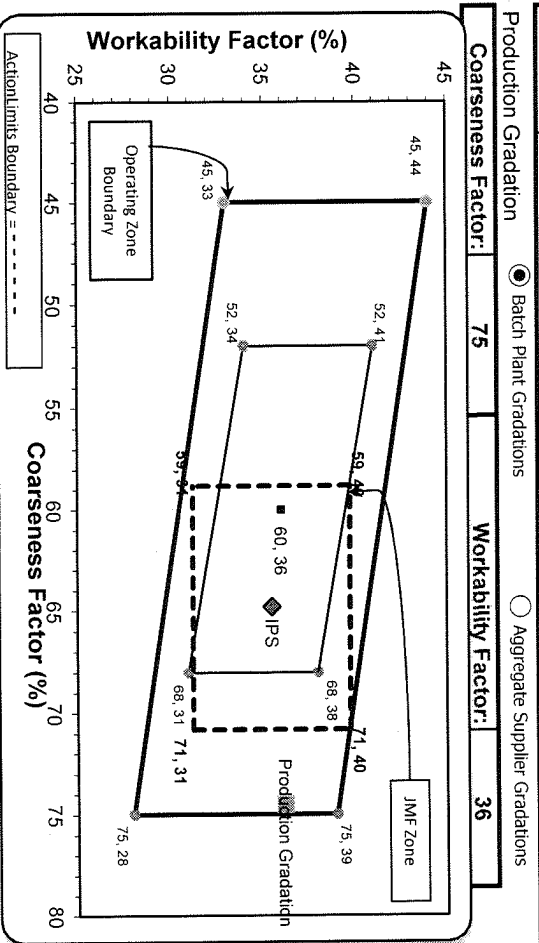
Agg. Class	Pit #	Source	Weight (ssn)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	93.7	100.0	100.0	97.8	2.2	2.2
1"	33.0	100.0	100.0	76.6	21.2	23.4
3/4"	7.5	97.3	100.0	67.1	9.5	32.9
1/2"	2.4	68.9	100.0	58.4	8.7	41.6
3/8"	2.0	45.1	100.0	52.4	6.0	47.6
#4	1.8	8.3	97.0	42.2	10.3	57.8
#8	1.8	3.8	85.0	36.2	6.0	63.8
#16	1.7	3.1	69.3	29.6	6.6	70.4
#30	1.6	2.9	49.2	21.3	8.3	78.7
#50	1.6	2.7	23.6	10.8	10.5	89.2
#100	1.4	2.5	6.8	3.9	7.0	96.1
LBW	1.0	2.1	1.7	1.6	2.3	98.4



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:	75	Workability Factor:	36
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 S11-Onsite Jefferson

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	93.7	%	
	1" (25mm)	33.0	%	
	3/4" (19mm)	7.5	%	
	1/2" (12.5mm)	2.4	%	
	3/8" (9.5mm)	2.0	%	
	#4 (4.75mm)	1.8	%	
	#8 (2.36mm)	1.8	%	
	#16 (1.18mm)	1.7	%	
	#30 (.6mm)	1.6	%	
	#50 (.3mm)	1.6	%	
	#100 (.15mm)	1.4	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	0.86	%	



Plant S11-Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

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)	68.9	%	
	3/8" (9.5mm)	45.1	%	
	#4 (4.75mm)	8.3	%	
	#8 (2.36mm)	3.8	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	3.09	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

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)	85.0	%	65-95
	#16 (1.18mm)	69.3	%	35-75
	#30 (.6mm)	49.2	%	20-55
	#50 (.3mm)	23.6	%	10-30
	#100 (.15mm)	6.8	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	3.64	%	

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: **6/19/23**

Dates Test Represents: **6/20/2023** through **6/26/2023**

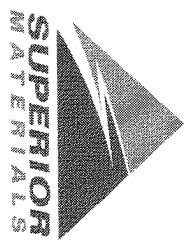
Concrete Grade: **P1M, 3500HP**

Contractor: _____

MIDOT No.: _____

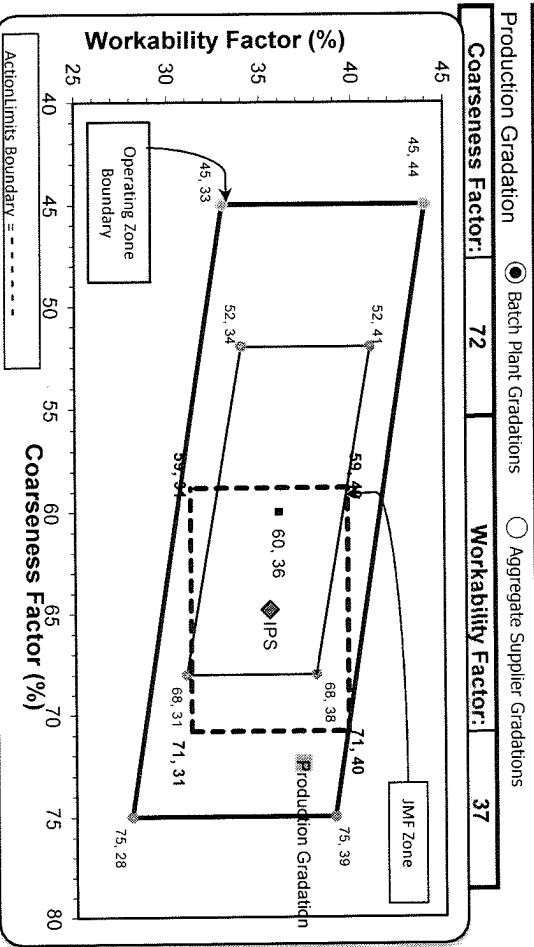
Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	750	4.59	2.62	24.4
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
Total Wt			3070	18.69		100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.9	100.0	100.0	98.2	1.8	1.8
1"	58.4	100.0	100.0	85.5	12.7	14.5
3/4"	20.8	98.4	100.0	72.0	13.5	28.0
1/2"	8.1	74.2	100.0	61.7	10.3	38.3
3/8"	6.5	47.4	100.0	54.6	7.1	45.4
#4	4.1	11.4	96.4	43.5	11.1	56.5
#8	3.2	5.2	85.6	37.2	6.2	62.8
#16	3.0	3.9	71.2	31.0	6.3	69.0
#30	2.8	3.5	51.0	22.6	8.4	77.4
#50	2.7	3.2	25.4	12.1	10.5	87.9
#100	2.5	2.9	7.6	4.7	14.8	95.3
LBW	2.0	2.4	1.4	1.9	2.8	98.1



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.
norm. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max.
norm. 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.



Initial Production Sample (IPS)

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 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.9	%	
	1" (25mm)	58.4	%	
	3/4" (19mm)	20.8	%	
	1/2" (12.5mm)	8.1	%	
	3/8" (9.5mm)	6.5	%	
	#4 (4.75mm)	4.1	%	
	#8 (2.36mm)	3.2	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-2
	Total Moisture	0.8	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

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)	98.4	%	
	1/2" (12.5mm)	74.2	%	
	3/8" (9.5mm)	47.4	%	
	#4 (4.75mm)	11.4	%	
	#8 (2.36mm)	5.2	%	
	#16 (1.18mm)	3.9	%	
	#30 (.6mm)	3.5	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.6	%	
	Wash Loss (#200/75um)	2.4	%	0-3
	Total Moisture	1.5	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/24/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	85.6	%	65-95
	#16 (1.18mm)	71.2	%	35-75
	#30 (.6mm)	51.0	%	20-55
	#50 (.3mm)	25.4	%	10-30
	#100 (.15mm)	7.6	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.63		2.6-3
	Wash Loss (#200/75um)	1.4	%	0-3
	Total Moisture	6.3	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-36**

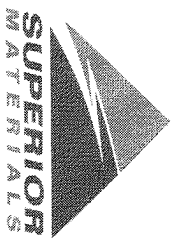
Sample Date: **6/19/23**

Dates Test Represents: **6/20/2023** through **6/26/2023**

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



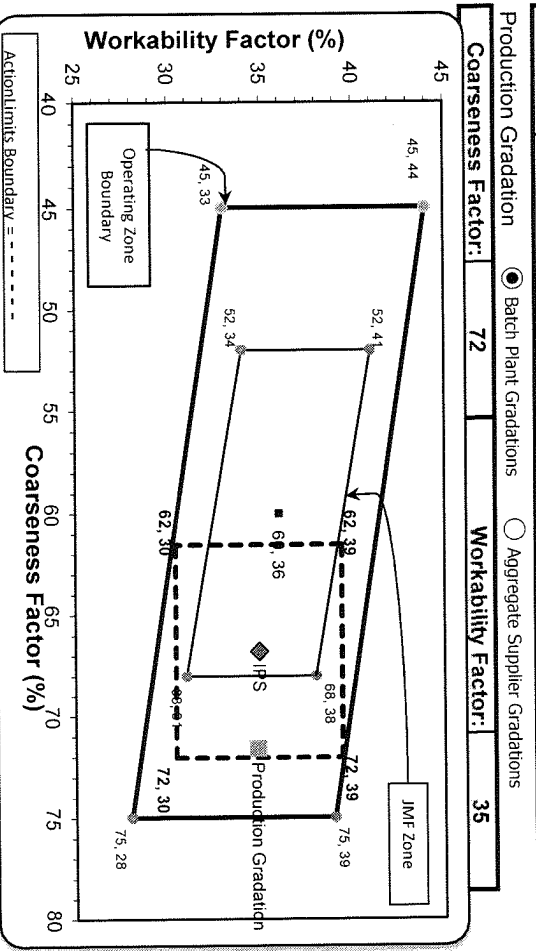
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Aggr. 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	800	4.89	2.62	26.1
2NS	63-92	Grange Hall	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"	94.5	100.0	100.0	98.1	1.9	1.9
1"	50.4	100.0	100.0	82.7	15.4	17.3
3/4"	12.8	100.0	100.0	69.6	13.1	30.4
1/2"	3.7	77.3	100.0	60.5	9.1	39.5
3/8"	2.7	51.1	100.0	53.3	7.2	46.7
#4	2.0	12.3	97.2	41.9	11.4	58.1
#8	2.0	5.1	83.9	34.8	7.1	65.2
#16	1.9	3.8	68.9	28.6	6.2	71.4
#30	1.9	3.4	50.1	21.1	7.5	78.9
#50	1.8	3.1	18.8	8.8	12.3	91.2
#100	1.6	2.8	3.1	2.5	6.3	97.5
LBW	1.1	2.2	0.4	1.1	1.4	98.9

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.



Initial Production Sample (IPS)

Coarseness Factor:	Workability Factor:
67	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: _____



Plant S36-Superior Auburn Hills

Product 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.5	%	
	1" (25mm)	50.4	%	
	3/4" (19mm)	12.8	%	
	1/2" (12.5mm)	3.7	%	
	3/8" (9.5mm)	2.7	%	
	#4 (4.75mm)	2.0	%	
	#8 (2.36mm)	2.0	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.3	%	
	Wash Loss (#200/75um)	1.1	%	0-2
	Total Moisture	1.33	%	



Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

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)	77.3	%	
	3/8" (9.5mm)	51.1	%	
	#4 (4.75mm)	12.3	%	
	#8 (2.36mm)	5.1	%	
	#16 (1.18mm)	3.8	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.8	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	2.84	%	



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: 06/18/2023 - 06/24/2023

Report Date 06/23/2023

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)	68.9	%	35-75
	#30 (.6mm)	50.1	%	20-55
	#50 (.3mm)	18.8	%	10-30
	#100 (.15mm)	3.1	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.78		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3
	Total Moisture	2.83	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-101**

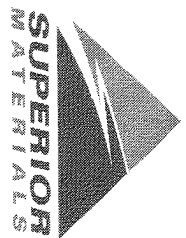
Sample Date: 6/19/23

Dates Test Represents: 6/20/2023 through 6/26/2023

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 (ssu)	ft ³	Specific Gravity	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
2NS	75-051	Mid Michigan	1200	7.23	2.66	39.1
Total Wt			3070	18.67		100.0

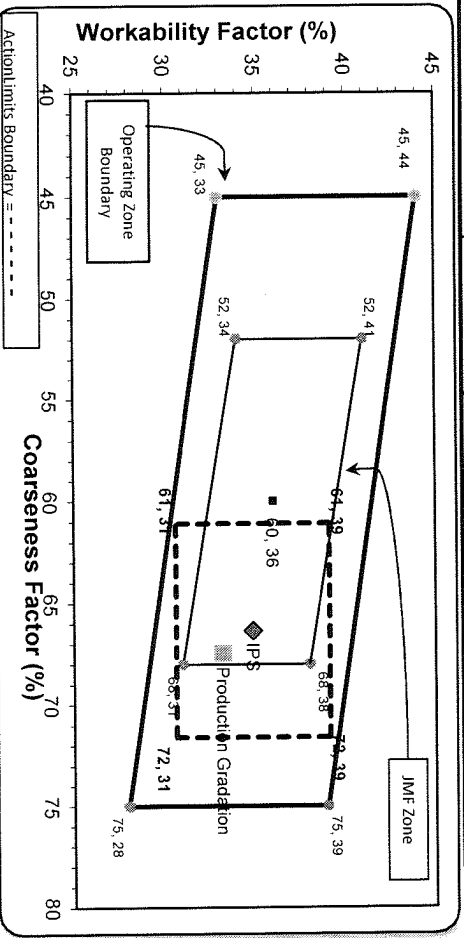
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	93.8	100.0	100.0	97.8	2.2	2.2
1"	43.3	100.0	100.0	80.2	17.6	19.8
3/4"	15.8	98.9	100.0	70.4	9.9	29.6
1/2"	4.1	80.8	100.0	61.6	8.8	38.4
3/8"	3.1	56.7	100.0	54.9	6.6	45.1
#4	2.5	13.9	96.6	42.3	12.7	57.7
#8	2.4	4.5	79.8	33.2	9.1	66.8
#16	2.3	3.2	65.4	27.2	6.0	72.8
#30	2.2	2.9	51.0	21.5	5.7	78.5
#50	2.1	2.7	28.2	12.5	9.0	87.5
#100	1.9	2.4	8.2	4.5	8.0	95.5
LBW	1.4	2.0	0.8	1.3	3.2	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. 1.5") aggregate is used.

Production Gradation

Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **67** Workability Factor: **33**



Initial Production Sample (IPS)

Coarseness Factor:	66	67	68
Workability Factor:	35	33	33
Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	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 7919-COARSE AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/24/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	93.8	%	
	1" (25mm)	43.3	%	
	3/4" (19mm)	15.8	%	
	1/2" (12.5mm)	4.1	%	
	3/8" (9.5mm)	3.1	%	
	#4 (4.75mm)	2.5	%	
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	2.3	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.1	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	2.73	%	



Plant S101-Superior Mount Clemens

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/24/2023

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)	98.9	%	
	1/2" (12.5mm)	80.8	%	
	3/8" (9.5mm)	56.7	%	
	#4 (4.75mm)	13.9	%	
	#8 (2.36mm)	4.5	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.2	%	
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	4.44	%	



Plant S101-Superior Mount Clemens

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/18/2023 - 06/24/2023

Report Date 06/24/2023

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)	79.8	%	65-95
	#16 (1.18mm)	65.4	%	35-75
	#30 (.6mm)	51.0	%	20-55
	#50 (.3mm)	28.2	%	10-30
	#100 (.15mm)	8.2	%	0-10
	#200 (75µm)	1.1	%	
	FM	2.71		2.6-3
	Wash Loss (#200/75um)	0.8	%	0-3
	Total Moisture	5.90	%	