

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **20**

Sample Date: **7/17/23**

Dates Test Represents: **7/18/2023**

through **7/24/2023**

Concrete Grade: **P1M 3500HP**

Contractor: _____

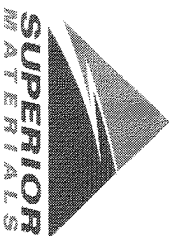
MDOT No.: _____

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	850	5.20	2.62	27.7
NNS	63-92	Grange Hall	1200	7.26	2.65	39.1
Total Wt						3070
						18.70
						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"	97.7	100.0	100.0	99.2	0.8	0.8
1"	47.5	100.0	100.0	82.6	16.7	17.4
3/4"	15.8	98.6	100.0	71.6	10.9	28.4
1/2"	7.8	76.1	100.0	62.7	8.9	37.3
3/8"	6.0	52.7	100.0	55.7	7.1	44.3
#4	4.1	10.7	96.6	42.1	13.6	57.9
#8	3.4	3.4	82.2	34.2	7.9	65.8
#16	3.1	2.4	65.7	27.4	6.8	72.6
#30	2.9	2.1	45.2	19.2	8.2	80.8
#50	2.6	2.0	18.6	8.7	10.5	91.3
#100	2.4	1.9	3.6	2.7	6.0	97.3
LBW	1.8	1.6	0.3	1.2	1.6	98.8

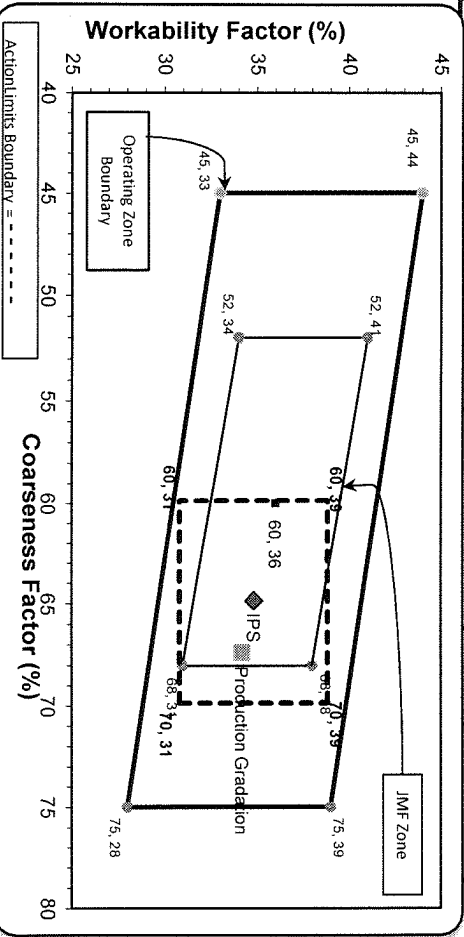
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size (nom.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



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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **67** Workability Factor: **34**



Initial Production Sample (IPS)

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

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.1	0.9	0.9
1"	80.8	18.2	19.2
3/4"	71.3	9.6	28.7
1/2"	64.0	7.3	36.0
3/8"	57.7	6.2	42.3
#4	42.8	15.0	57.2
#8	34.8	7.9	65.2
#16	28.4	6.4	71.6
#30	20.2	8.2	79.8
#50	7.6	12.6	92.4
#100	1.6	6.0	98.4
LBW	1.0	0.6	99.0

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S20-Superior Flint
 Product 7919-COARSE AGG P1M LS
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.7	%	
	1" (25mm)	47.5	%	
	3/4" (19mm)	15.8	%	
	1/2" (12.5mm)	7.8	%	
	3/8" (9.5mm)	6.0	%	
	#4 (4.75mm)	4.1	%	
	#8 (2.36mm)	3.4	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.4	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	0.78	%	



Plant S20-Superior Flint
 Product 7920-INTERMED AGG P1M LS
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

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)	98.6	%	
	1/2" (12.5mm)	76.1	%	
	3/8" (9.5mm)	52.7	%	
	#4 (4.75mm)	10.7	%	
	#8 (2.36mm)	3.4	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	1.63	%	



Plant S20-Superior Flint
 Product 1022-2NS GR
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

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)	82.2	%	65-95
	#16 (1.18mm)	65.7	%	35-75
	#30 (.6mm)	45.2	%	20-55
	#50 (.3mm)	18.6	%	10-30
	#100 (.15mm)	3.6	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.88		2.6-3
	Wash Loss (#200/75um)	0.3	%	0-3
	Total Moisture	2.71	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Sample Date: 7/17/23

Dates Test Represents: 7/18/2023 through 7/24/2023

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 (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1020	6.24	2.62	33.2
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
			Total Wt	18.70		100.0

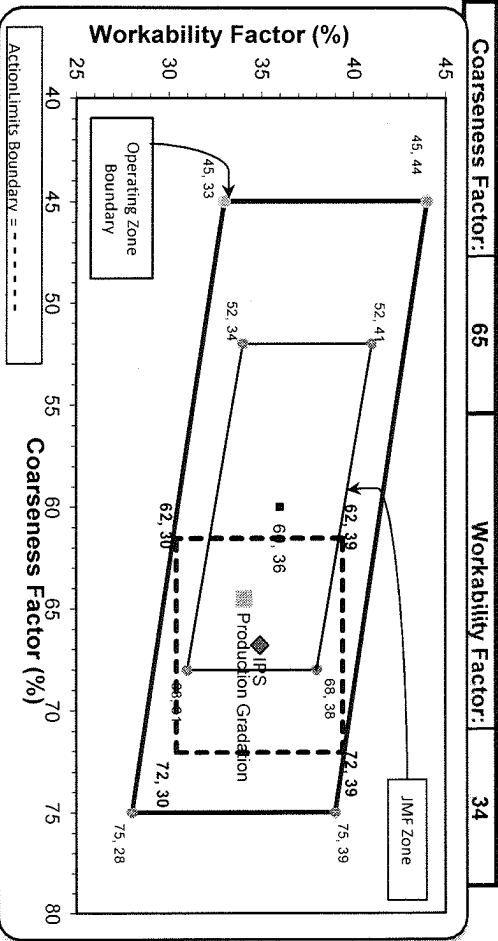
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	93.1	100.0	100.0	97.7	2.3	2.3
1"	29.5	100.0	100.0	76.6	21.1	23.4
3/4"	8.9	99.5	100.0	69.6	7.0	30.4
1/2"	4.9	83.0	100.0	63.7	5.9	36.3
3/8"	4.3	61.2	100.0	57.5	6.2	42.5
#4	2.7	14.0	97.4	42.8	14.6	57.2
#8	2.4	4.5	81.9	34.1	8.8	65.9
#16	2.2	3.3	64.9	27.0	7.0	73.0
#30	2.1	3.0	44.5	18.9	8.1	81.1
#50	2.0	2.9	18.7	8.8	10.1	91.2
#100	1.8	2.7	3.3	2.6	6.1	97.4
LBW	1.4	2.3	0.4	1.3	1.4	98.7

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. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)



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 7919-COARSE AGG P1M LS
Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	93.1	%	
	1" (25mm)	29.5	%	
	3/4" (19mm)	8.9	%	
	1/2" (12.5mm)	4.9	%	
	3/8" (9.5mm)	4.3	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.4	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	1.81	%	



Plant S36-Superior Auburn Hills
 Product 7920-INTERMED AGG P1M LS
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

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)	99.5	%	
	1/2" (12.5mm)	83.0	%	
	3/8" (9.5mm)	61.2	%	
	#4 (4.75mm)	14.0	%	
	#8 (2.36mm)	4.5	%	
	#16 (1.18mm)	3.3	%	
	#30 (.6mm)	3.0	%	
	#50 (.3mm)	2.9	%	
	#100 (.15mm)	2.7	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.3	%	0-3
	Total Moisture	2.45	%	



Plant S36-Superior Auburn Hills

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 07/16/2023 - 07/22/2023

Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.4	%	95-100
	#8 (2.36mm)	81.9	%	65-95
	#16 (1.18mm)	64.9	%	35-75
	#30 (.6mm)	44.5	%	20-55
	#50 (.3mm)	18.7	%	10-30
	#100 (.15mm)	3.3	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.89		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3
	Total Moisture	3.51	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-39

Sample Date: 7/17/23

Dates Test Represents: 7/18/2023 through 7/24/2023

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
N2S	44-051	Krake Willis Rd	1250	7.56	2.65	40.7
Total Wt						18.69
						100.0

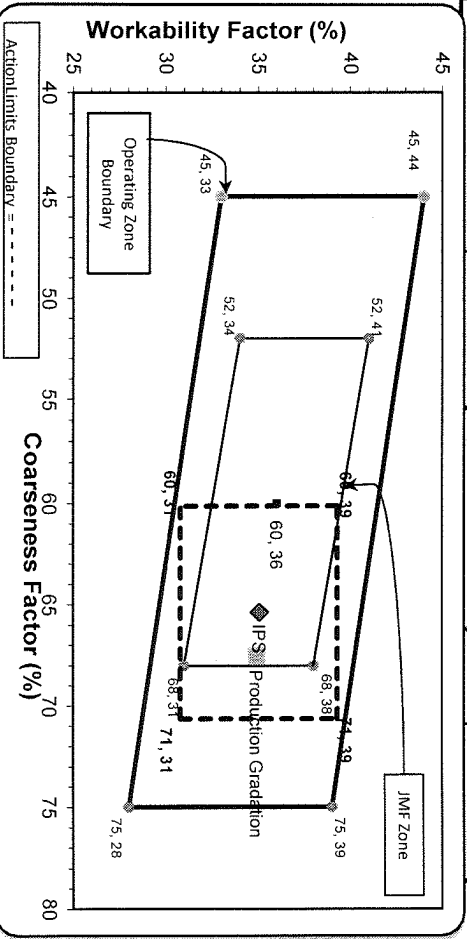
Verify this number is 100%

Sieve	CA	IA	N2S	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	92.5	100.0	100.0	97.5	2.5	2.5
1"	37.8	100.0	100.0	79.3	18.2	20.7
3/4"	12.4	99.1	100.0	70.7	8.7	29.3
1/2"	5.7	78.6	100.0	63.1	7.6	36.9
3/8"	4.4	53.2	100.0	56.0	7.1	44.0
#4	3.3	9.9	95.9	42.7	13.3	57.3
#8	2.8	2.9	81.6	34.9	7.8	65.1
#16	2.7	2.2	68.1	29.2	5.7	70.8
#30	2.6	2.1	52.3	22.7	6.5	77.3
#50	2.4	2.0	26.1	11.9	10.8	88.1
#100	2.2	1.9	7.3	4.2	7.7	95.8
LBW	1.7	1.5	1.1	1.4	2.8	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.

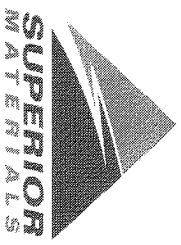
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 68 Workability Factor: 35



Initial Production Sample (IPS)

Sieve	% 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



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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S39-Superior Sterling Heights

Product 7919-COARSE AGG P1M LS

Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician

Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	92.5	%	
	1" (25mm)	37.8	%	
	3/4" (19mm)	12.4	%	
	1/2" (12.5mm)	5.7	%	
	3/8" (9.5mm)	4.4	%	
	#4 (4.75mm)	3.3	%	
	#8 (2.36mm)	2.8	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	0.74	%	



Plant S39-Superior Sterling Heights
 Product 7920-INTERMED AGG P1M LS
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

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)	99.1	%	
	1/2" (12.5mm)	78.6	%	
	3/8" (9.5mm)	53.2	%	
	#4 (4.75mm)	9.9	%	
	#8 (2.36mm)	2.9	%	
	#16 (1.18mm)	2.2	%	
	#30 (.6mm)	2.1	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	3.33	%	



Plant S39-Superior Sterling Heights
 Product 1022-2NS GR
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.9	%	95-100
	#8 (2.36mm)	81.6	%	65-95
	#16 (1.18mm)	68.1	%	35-75
	#30 (.6mm)	52.3	%	20-55
	#50 (.3mm)	26.1	%	10-30
	#100 (.15mm)	7.3	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75µm)	1.1	%	0-3
	Total Moisture	2.81	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

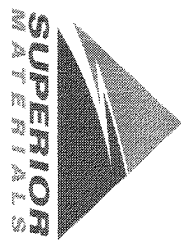
Sample Date: **7/17/23**

Dates Test Represents: **7/18/2023** through **7/24/2023**

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	58-003	Stoneco	1370	8.16	2.69	43.9	
IA	58-003	Stoneco	550	3.28	2.69	17.6	
2NS	81-019	Pleasant Lake	1200	7.26	2.65	38.5	
Total Wt						3120	100.0

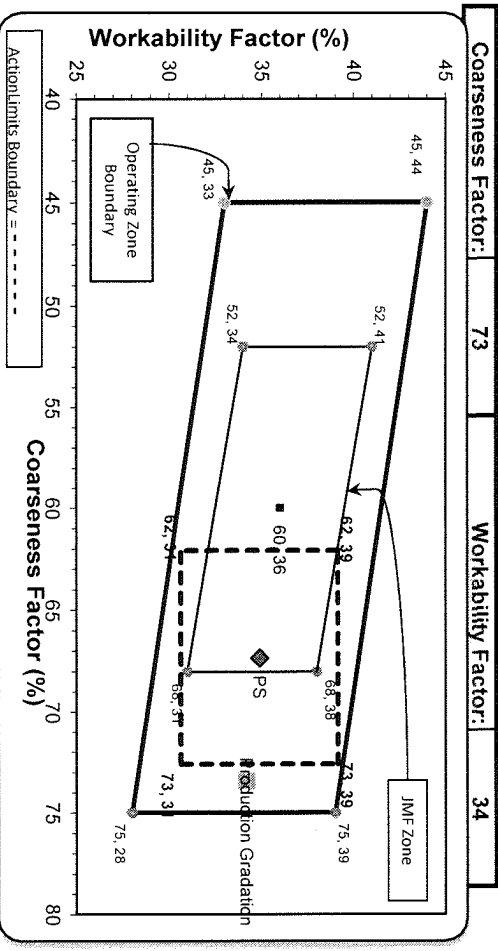
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	40.6	100.0	100.0	73.9	26.1	26.1
3/4"	15.5	100.0	100.0	62.9	37.1	37.1
1/2"	9.6	88.4	100.0	58.3	41.7	41.7
3/8"	7.4	56.6	100.0	51.7	48.3	48.3
#4	2.6	10.4	99.1	41.1	58.9	58.9
#8	1.5	3.9	85.4	34.2	65.8	65.8
#16	1.2	2.6	67.5	26.9	73.1	73.1
#30	1.2	2.2	48.9	19.7	80.3	80.3
#50	1.1	2.0	23.4	9.8	90.2	90.2
#100	1.0	1.9	6.5	3.3	96.7	96.7
LBW	0.8	1.7	0.9	1.0	99.0	99.0

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

Initial Production Sample (IPS)



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	85.5	14.5	14.5
3/4"	73.4	12.1	26.6
1/2"	61.0	12.4	39.0
3/8"	56.2	4.8	43.8
#4	43.1	13.1	56.9
#8	34.9	8.2	65.1
#16	29.4	5.5	70.6
#30	21.6	7.8	78.4
#50	8.1	13.4	91.9
#100	2.2	5.9	97.8
LBW	1.4	0.8	98.6

PREPARED BY: SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi
 Product 7919-COARSE AGG P1M LS
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	40.6	%	
	3/4" (19mm)	15.5	%	
	1/2" (12.5mm)	9.6	%	
	3/8" (9.5mm)	7.4	%	
	#4 (4.75mm)	2.6	%	
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.2	%	
	#30 (.6mm)	1.2	%	
	#50 (.3mm)	1.1	%	
	#100 (.15mm)	1.0	%	
	#200 (75µm)	0.9	%	
	Wash Loss (#200/75um)	0.8	%	0-2
	Total Moisture	1.99	%	



Plant S102-Superior Novi
 Product 7920-INTERMED AGG P1M LS
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

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)	88.4	%	
	3/8" (9.5mm)	56.6	%	
	#4 (4.75mm)	10.4	%	
	#8 (2.36mm)	3.9	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.9	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75µm)	1.7	%	0-3
	Total Moisture	3.49	%	



Plant S102-Superior Novi
 Product 1022-2NS GR
 Period: 07/16/2023 - 07/22/2023

Name/Title Doug Storey / QC Technician
 Report Date 07/22/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.1	%	95-100
	#8 (2.36mm)	85.4	%	65-95
	#16 (1.18mm)	67.5	%	35-75
	#30 (.6mm)	48.9	%	20-55
	#50 (.3mm)	23.4	%	10-30
	#100 (.15mm)	6.5	%	0-10
	#200 (75µm)	1.6	%	
	FM	2.69		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	4.39	%	