

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P11**

Contractor: \_\_\_\_\_

Sample Date: **4/29/24**

MIDOT No.: \_\_\_\_\_

Dates Test Represents: **4/30/2024** through **5/6/2024**

Concrete Grade: **P1M, 3500HP**

Agg. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	920	5.63	2.62	30.0
2NS	95-013	Smelter Bay	1200	7.26	2.65	39.1
<b>Total Wt:</b>			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

<--- Verify this number is 100%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	93.2	100.0	100.0	97.9	2.1	2.1
1"	30.4	100.0	100.0	78.5	19.4	21.5
3/4"	7.4	100.0	100.0	70.9	7.6	29.1
1/2"	1.5	100.0	100.0	63.0	7.9	37.0
3/8"	1.5	51.3	100.0	54.9	8.0	45.1
#4	1.5	7.7	95.7	40.2	14.7	59.8
#8	1.5	2.7	84.9	34.5	5.7	65.5
#16	1.4	2.1	70.6	28.7	5.8	71.3
#30	1.4	1.9	50.7	20.8	7.8	79.2
#50	1.4	1.8	23.7	10.2	10.6	89.8
#100	1.3	1.8	7.2	3.8	6.5	96.2
LBW	1.0	1.7	1.1	1.2	2.5	98.8

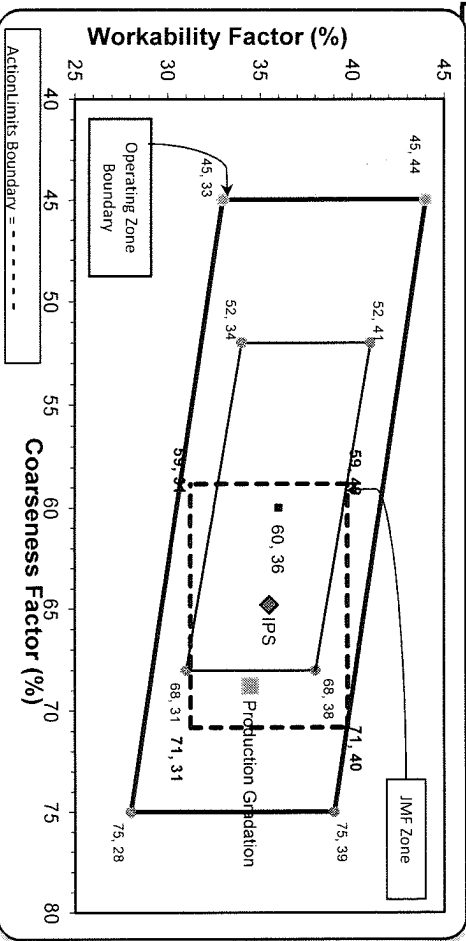
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 nom. max. #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max.  
 nom. max. #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when  
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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

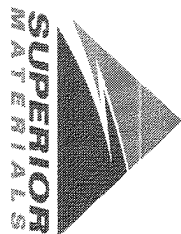
Initial Production Sample (IPS)

Coarseness Factor: **69** Workability Factor: **34**

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



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

PREPARED BY:  
 SM, LLC Technical Service

Approved By: \_\_\_\_\_



**Plant** S11-Onsite Jefferson

**Product** 7919-COARSE AGG P1M LS

**Period:** 04/28/2024 - 05/04/2024

**Name/Title** Doug Storey / QC Technician

**Report Date** 05/04/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	93.2	%	
	1" (25mm)	30.4	%	
	3/4" (19mm)	7.4	%	
	1/2" (12.5mm)	1.5	%	
	3/8" (9.5mm)	1.5	%	
	#4 (4.75mm)	1.5	%	
	#8 (2.36mm)	1.5	%	
	#16 (1.18mm)	1.4	%	
	#30 (.6mm)	1.4	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	0.43	%	



Plant S11-Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

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)	98.5	%	
	1/2" (12.5mm)	78.1	%	
	3/8" (9.5mm)	51.3	%	
	#4 (4.75mm)	7.7	%	
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.15	%	



Plant S11-Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.7	%	95-100
	#8 (2.36mm)	84.9	%	65-95
	#16 (1.18mm)	70.6	%	35-75
	#30 (.6mm)	50.7	%	20-55
	#50 (.3mm)	23.7	%	10-30
	#100 (.15mm)	7.2	%	0-10
	#200 (75µm)	1.7	%	
	FM	2.67		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	4.71	%	

# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **12**

Sample Date: **4/29/24**

Dates Test Represents: **4/30/2024** through **5/6/2024**

Concrete Grade: **P1M, 3500HP**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

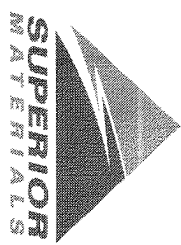
Aggr. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	Specific Gravity	Contribution %
CA	71-47	Presque Isle	1070	6.54	2.62	34.9
IA	71-47	Presque Isle	800	4.89	2.62	26.1
2NS	63-115	Ray Rd	1200	7.26	2.65	39.1
Total Wt			<b>3070</b>	<b>18.70</b>		<b>100.0</b>

<----- Verify this number is 100%

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.3	100.0	100.0	98.0	2.0	2.0
1"	39.0	100.0	100.0	78.7	19.3	21.3
3/4"	12.4	97.2	100.0	68.7	10.0	31.3
1/2"	4.0	73.8	100.0	59.7	9.0	40.3
3/8"	3.0	49.0	100.0	52.9	6.8	47.1
#4	2.8	8.1	95.0	40.2	12.7	59.8
#8	2.7	2.7	79.5	32.7	7.5	67.3
#16	2.6	2.1	64.6	26.7	6.0	73.3
#30	2.4	1.9	48.5	20.3	6.4	79.7
#50	2.3	1.8	22.0	9.9	10.4	90.1
#100	2.1	1.7	3.5	2.5	7.3	97.5
LBW	1.6	1.6	0.5	1.2	1.4	98.8

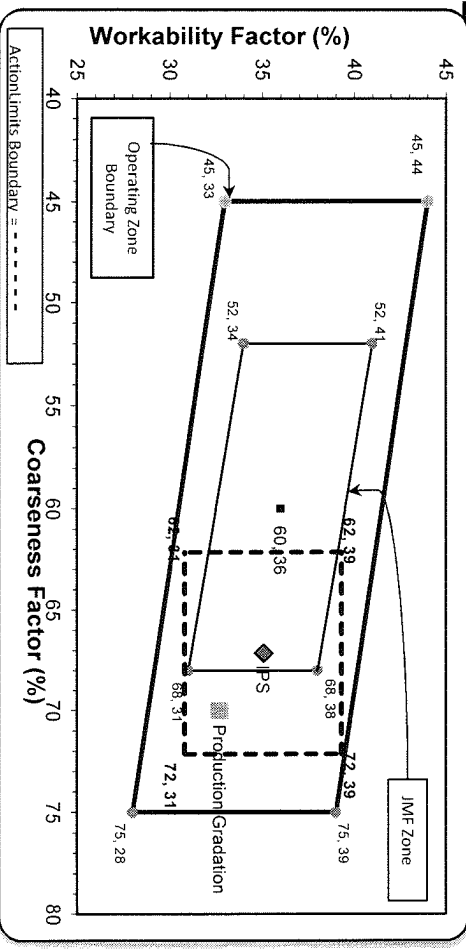
\*Maximum % Retained must be above the 3/8" sieve.  
 \*Any two adjacent sieves must equal 10% except max.  
 nom. max. #100 and #200 sieves.  
 \*% Retained must be at least 4% for each sieve except max.  
 nom. max. #100 and #200 sieves.  
 \*% Retained must be at least 8% for the 1" sieve when a 2" 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: **70** Workability Factor: **33**



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"	74.0	9.8	26.0
1/2"	63.7	10.3	36.3
3/8"	56.4	7.3	43.6
#4	43.0	13.4	57.0
#8	35.1	7.9	64.9
#16	29.0	6.1	71.0
#30	20.9	8.0	79.1
#50	8.1	12.8	91.9
#100	1.6	6.5	98.4
LBW	0.9	0.8	99.1

PREPARED BY:  
 SM, LLC Technical Service

Approved By:



**Plant** S12-Onsite Southfield

**Product** 7919-COARSE AGG P1M LS

**Name/Title** Doug Storey / QC Technician

**Period:** 04/28/2024 - 05/04/2024

**Report Date** 05/04/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.3	%	
	1" (25mm)	39.0	%	
	3/4" (19mm)	12.4	%	
	1/2" (12.5mm)	4.0	%	
	3/8" (9.5mm)	3.0	%	
	#4 (4.75mm)	2.8	%	
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.4	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	1.20	%	



Plant S12-Onsite Southfield

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

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)	97.2	%	
	1/2" (12.5mm)	73.8	%	
	3/8" (9.5mm)	49.0	%	
	#4 (4.75mm)	8.1	%	
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.1	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.8	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	1.20	%	



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 04/28/2024 - 05/04/2024

Name/Title Doug Storey / QC Technician

Report Date 05/04/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	95.0	%	95-100
	#8 (2.36mm)	79.5	%	65-95
	#16 (1.18mm)	64.6	%	35-75
	#30 (.6mm)	48.5	%	20-55
	#50 (.3mm)	22.0	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.87		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	4.97	%	



# Aggregate Optimization Chart

# Production Gradation Report

PLANT #: **P-36**

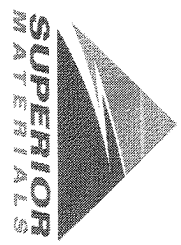
Sample Date: **4/29/24**

Dates Test Represents: **4/30/2024** through **5/6/2024**

Concrete Grade: **P1M, 3500HP**

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_



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

Verify this number is 100%

Aggr. Class	Pit #	Source	Weight (SSD)	ft <sup>3</sup>	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	
<b>Total Wt</b>						<b>3070</b>	<b>100.0</b>

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	97.1	100.0	100.0	99.0	1.0	1.0
1"	53.9	100.0	100.0	83.9	15.1	16.1
3/4"	24.0	97.7	100.0	72.9	11.0	27.1
1/2"	7.0	82.4	100.0	63.0	9.9	37.0
3/8"	5.0	56.3	100.0	55.5	7.5	44.5
#4	3.7	10.5	98.2	42.4	13.1	57.6
#8	3.1	2.7	83.9	34.6	7.8	65.4
#16	2.8	1.9	68.9	28.4	6.2	71.6
#30	2.6	1.8	50.6	21.2	7.2	78.8
#50	2.4	1.7	20.7	9.4	11.8	90.6
#100	2.2	1.6	2.9	2.3	7.1	97.7
LBW	1.8	1.5	0.2	1.1	1.2	98.9

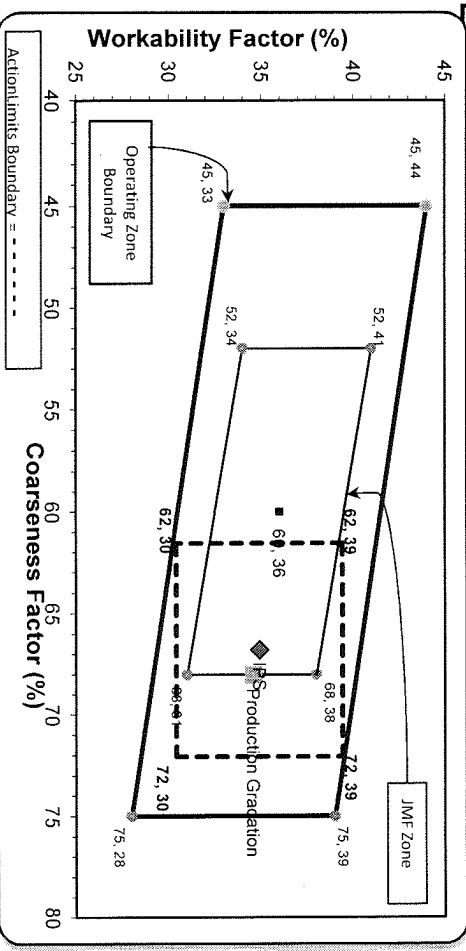
\*Maximum % Retained must be above the 3/8" sieve.  
\*Any two adjacent sieves must equal 10% except max.  
nom. max., #100 and #200 sieves.  
\*% Retained must be at least 4% for each sieve except max.  
nom. max., #100 and #200 sieves.  
\*% Retained must be at least 8% for the 1" sieve when a 2" max.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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **68** Workability Factor: **35**

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



Superior Auburn Hills  
2470 Auburn Road  
Auburn Hills, MI 48432

**Plant** S36-Superior Auburn Hills

**Product** 7919-COARSE AGG P1M LS

**Name/Title** Doug Storey / QC Technician

**Period:** 04/28/2024 - 05/04/2024

**Report Date** 05/04/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	97.1	%	
	1" (25mm)	53.9	%	
	3/4" (19mm)	24.0	%	
	1/2" (12.5mm)	7.0	%	
	3/8" (9.5mm)	5.0	%	
	#4 (4.75mm)	3.7	%	
	#8 (2.36mm)	3.1	%	
	#16 (1.18mm)	2.8	%	
	#30 (.6mm)	2.6	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	1.8	%	0-2
	Total Moisture	1.71	%	



Superior Auburn Hills  
2470 Auburn Road  
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

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)	97.7	%	
	1/2" (12.5mm)	82.4	%	
	3/8" (9.5mm)	56.3	%	
	#4 (4.75mm)	10.5	%	
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	1.9	%	
	#30 (.6mm)	1.8	%	
	#50 (.3mm)	1.7	%	
	#100 (.15mm)	1.6	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	3.04	%	



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: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.2	%	95-100
	#8 (2.36mm)	83.9	%	65-95
	#16 (1.18mm)	68.9	%	35-75
	#30 (.6mm)	50.6	%	20-55
	#50 (.3mm)	20.7	%	10-30
	#100 (.15mm)	2.9	%	0-10
	#200 (75µm)	0.2	%	
	FM	2.75		2.6-3
	Wash Loss (#200/75um)	0.2	%	0-3
	Total Moisture	2.85	%	

# Aggregate Optimization Chart

## Production Gradation Report

PLANT #: **P-02**

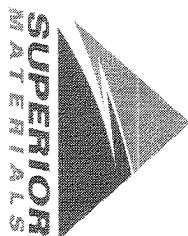
Sample Date: **4/29/24**

Dates Test Represents: **4/30/2024** through **5/6/2024**

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 <sup>3</sup>	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	63-115	Ray Rd	1200	7.26	2.65	39.1
		<b>Total Wt.</b>	<b>3070</b>	<b>18.70</b>		<b>100.0</b>

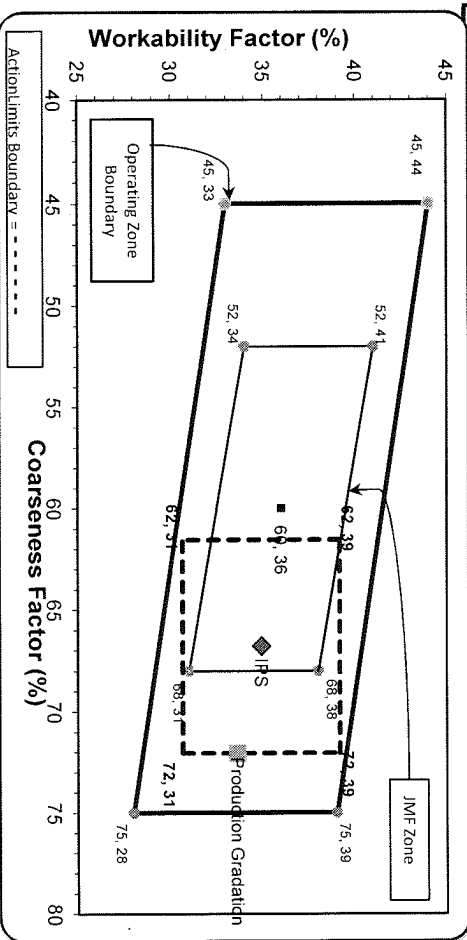
  

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.4	100.0	100.0	98.7	1.3	1.3
1"	40.3	100.0	100.0	79.2	19.6	20.8
3/4"	10.2	96.4	100.0	67.8	11.4	32.2
1/2"	3.6	71.2	100.0	58.9	8.9	41.1
3/8"	3.2	45.9	100.0	52.2	6.7	47.8
#4	2.7	8.5	96.1	40.7	11.4	59.3
#8	2.6	4.2	80.9	33.6	7.1	66.4
#16	2.6	3.7	65.8	27.6	6.0	72.4
#30	2.5	3.6	49.6	21.2	6.4	78.8
#50	2.3	3.4	22.7	10.6	10.6	89.4
#100	2.0	3.1	3.5	2.9	7.7	97.1
LBW	1.5	2.8	0.4	1.4	1.5	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: **72** Workability Factor: **34**



Initial Production Sample (IPS)

Sieve	Coarseness Factor:	Workability Factor:	% Retained	Cumulative % Retained
2"	67	35	0.0	0.0
1.5"			0.0	0.0
1"			15.0	15.0
3/4"			12.7	27.7
1/2"			7.8	35.5
3/8"			8.0	43.5
#4			13.8	57.3
#8			7.8	65.1
#16			5.9	71.0
#30			8.0	79.0
#50			12.8	91.8
#100			6.5	98.4
LBW			0.9	99.3

PREPARED BY:  
SM, LLC Technical Service

Approved By: \_\_\_\_\_



**Plant** S02-Hoover

**Product** 7919-COARSE AGG P1M LS

**Name/Title** Doug Storey / QC Technician

**Period:** 04/28/2024 - 05/04/2024

**Report Date** 05/04/2024

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.4	%	
	1" (25mm)	40.3	%	
	3/4" (19mm)	10.2	%	
	1/2" (12.5mm)	3.6	%	
	3/8" (9.5mm)	3.2	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.3	%	
	#100 (.15mm)	2.0	%	
	#200 (75µm)	1.7	%	
	Wash Loss (#200/75um)	1.5	%	0-2
	Total Moisture	1.17	%	



Plant S02-Hoover

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

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)	96.4	%	
	1/2" (12.5mm)	71.2	%	
	3/8" (9.5mm)	45.9	%	
	#4 (4.75mm)	8.5	%	
	#8 (2.36mm)	4.2	%	
	#16 (1.18mm)	3.7	%	
	#30 (.6mm)	3.6	%	
	#50 (.3mm)	3.4	%	
	#100 (.15mm)	3.1	%	
	#200 (75µm)	3.0	%	
	Wash Loss (#200/75um)	2.8	%	0-3
	Total Moisture	2.32	%	



Plant S02-Hoover

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 04/28/2024 - 05/04/2024

Report Date 05/04/2024

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.1	%	95-100
	#8 (2.36mm)	80.9	%	65-95
	#16 (1.18mm)	65.8	%	35-75
	#30 (.6mm)	49.6	%	20-55
	#50 (.3mm)	22.7	%	10-30
	#100 (.15mm)	3.5	%	0-10
	#200 (75µm)	0.5	%	
	FM	2.81		2.6-3
	Wash Loss (#200/75um)	0.4	%	0-3
	Total Moisture	3.55	%	