Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 7/25/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/26/2022 through 8/1/2022

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		Total Wt	**3070**	**18.69**		100.0

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

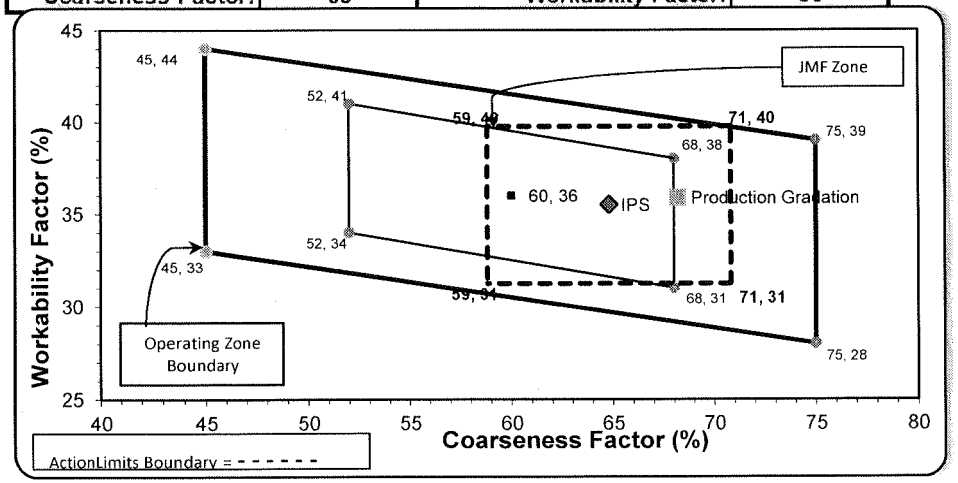
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.3	100.0	100.0	99.5	0.5	0.5
1"	47.6	100.0	100.0	84.6	14.9	15.4
3/4"	13.4	98.2	100.0	74.1	10.6	25.9
1/2"	3.6	76.0	100.0	64.5	9.5	35.5
3/8"	2.8	49.2	100.0	56.3	8.3	43.7
#4	2.3	10.6	96.6	43.2	13.1	56.8
#8	2.1	4.1	83.6	35.9	7.3	64.1
#16	2.0	3.1	68.5	29.4	6.5	70.6
#30	1.9	2.8	48.8	21.3	8.1	78.7
#50	1.9	2.7	23.3	10.9	10.4	89.1
#100	1.7	2.6	6.6	4.0	6.9	96.0
LBW	1.4	2.1	1.1	1.5	2.5	98.5

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:	68	Workability Factor:	36



Intial 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:

Edw. C. Levy Co.

JMT
8911 W. Jefferson
Detroit, 48209
(313) 429-2429

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

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)	83.6	%	65-95
	#16 (1.18mm)	68.5	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	23.3	%	10-30
	#100 (.15mm)	6.6	%	0-10
	#200 (75µm)	1.4	%	
	FM	2.73		2.6-3
	Wash Loss (#200/75um)	1.1	%	0-3
	Total Moisture	3.7	%	

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(313) 429-2429

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

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)	98.2	%	
	1/2" (12.5mm)	76.0	%	
	3/8" (9.5mm)	49.2	%	
	#4 (4.75mm)	10.6	%	
	#8 (2.36mm)	4.1	%	
	#16 (1.18mm)	3.1	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	3.2	%	

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JMT
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Detroit, 48209
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Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.3	%	
	1" (25mm)	47.6	%	
	3/4" (19mm)	13.4	%	
	1/2" (12.5mm)	3.6	%	
	3/8" (9.5mm)	2.8	%	
	#4 (4.75mm)	2.3	%	
	#8 (2.36mm)	2.1	%	
	#16 (1.18mm)	2.0	%	
	#30 (.6mm)	1.9	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.5	%	
	Wash Loss (#200/75um)	1.4	%	0-2
	Total Moisture	1.7	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-36

Contractor: _____

Sample Date: 7/25/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/26/2022 through 8/1/2022

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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
2NS	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	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	94.7	100.0	100.0	98.4	1.6	1.6
1"	23.8	100.0	100.0	77.7	20.8	22.3
3/4"	3.6	97.9	100.0	71.1	6.6	28.9
1/2"	1.1	69.0	100.0	61.2	9.9	38.8
3/8"	1.0	43.0	100.0	53.0	8.2	47.0
#4	1.0	9.1	98.0	41.5	11.5	58.5
#8	1.0	4.4	82.3	33.9	7.6	66.1
#16	1.0	3.6	66.8	27.5	6.3	72.5
#30	1.0	3.3	47.4	19.9	7.7	80.1
#50	0.9	3.0	17.3	8.0	11.9	92.0
#100	0.8	2.6	3.2	2.3	5.7	97.7
LBW	0.6	2.2	0.5	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.

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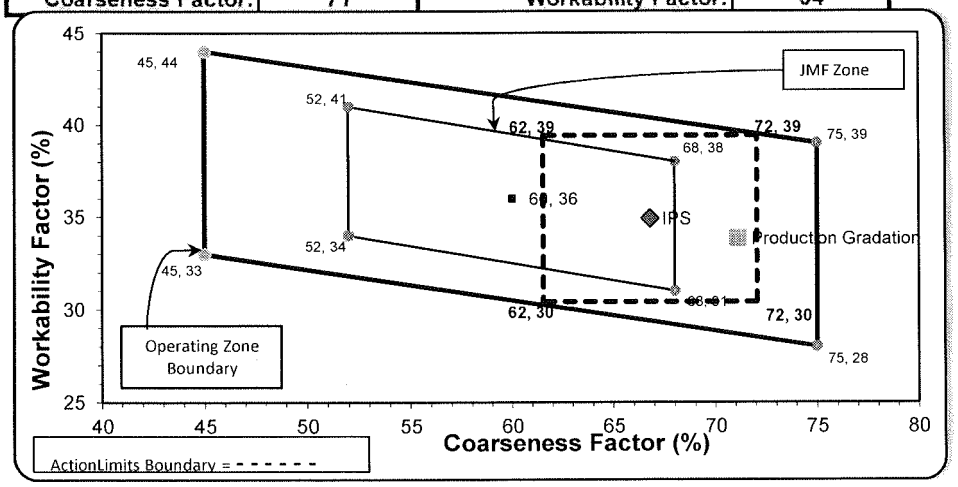
Farmington Hills, MI 48336

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	71	Workability Factor:	34



Intial Production Sample (IPS)

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 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.0	%	95-100
	#8 (2.36mm)	82.3	%	65-95
	#16 (1.18mm)	66.8	%	35-75
	#30 (.6mm)	47.4	%	20-55
	#50 (.3mm)	17.3	%	10-30
	#100 (.15mm)	3.2	%	0-10
	#200 (75µm)	0.6	%	
	FM	2.85		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	2.78	%	

Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7920-INTERMED AGG P1M LS

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

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)	97.9	%	
	1/2" (12.5mm)	69.0	%	
	3/8" (9.5mm)	43.0	%	
	#4 (4.75mm)	9.1	%	
	#8 (2.36mm)	4.4	%	
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	3.3	%	
	#50 (.3mm)	3.0	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	0.11	%	

Superior Auburn Hills
2470 Auburn Road
Auburn Hills, MI 48432

Plant S36-Superior Auburn Hills

Product 7919-COARSE AGG P1M LS

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	94.7	%	
	1" (25mm)	23.8	%	
	3/4" (19mm)	3.6	%	
	1/2" (12.5mm)	1.1	%	
	3/8" (9.5mm)	1.0	%	
	#4 (4.75mm)	1.0	%	
	#8 (2.36mm)	1.0	%	
	#16 (1.18mm)	1.0	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	0.9	%	
	#100 (.15mm)	0.8	%	
	#200 (75µm)	0.7	%	
	Wash Loss (#200/75um)	0.6	%	0-2
	Total Moisture	0.66	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-39

Sample Date: 7/25/22

Concrete Grade: **P1M, 3500HP**

Contractor: _____

Dates Test Represents: 7/26/2022 through 8/1/2022

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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

<----- 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"	98.1	100.0	100.0	99.4	0.6	0.6
1"	56.5	100.0	100.0	85.5	13.8	14.5
3/4"	20.8	99.2	100.0	73.5	12.1	26.5
1/2"	8.8	76.9	100.0	63.7	9.8	36.3
3/8"	6.4	51.7	100.0	56.3	7.4	43.7
#4	4.4	11.6	97.0	44.0	12.3	56.0
#8	3.8	4.1	80.5	35.1	8.9	64.9
#16	3.6	3.0	66.5	29.1	6.1	70.9
#30	3.4	2.8	50.0	22.2	6.8	77.8
#50	3.1	2.7	26.0	12.3	9.9	87.7
#100	2.5	2.5	8.2	4.8	7.5	95.2
LBW	1.9	2.1	1.3	1.7	3.1	98.3

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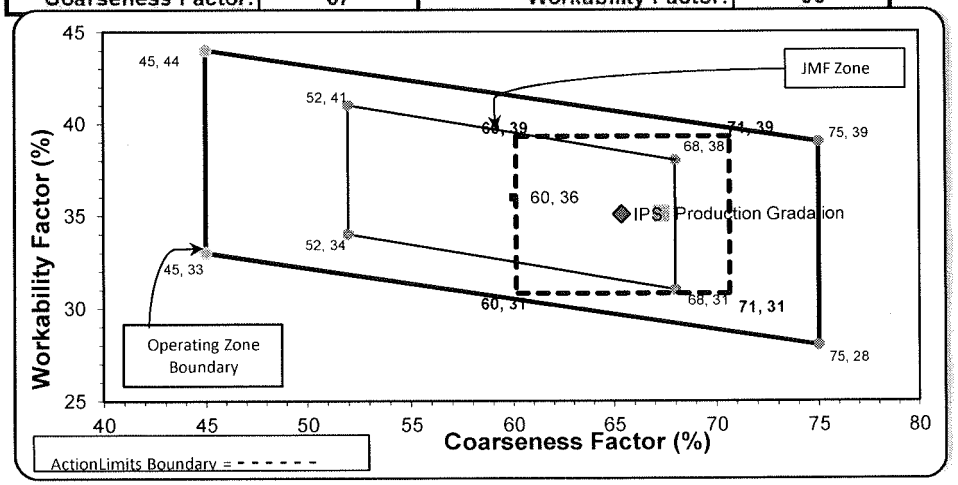
Suite 500
Farmington Hills, MI 48336

*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 SupplierGradations

Coarseness Factor:	67	Workability Factor:	35



Intial Production Sample (IPS)

Coarseness Factor:	65
Workability Factor:	35

Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	99.6	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: 07/24/2022 - 07/30/2022

Report Date 07/29/2022

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)	80.5	%	65-95
	#16 (1.18mm)	66.5	%	35-75
	#30 (.6mm)	50.0	%	20-55
	#50 (.3mm)	26.0	%	10-30
	#100 (.15mm)	8.2	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.3	%	0-3
	Total Moisture	3.00	%	

Plant S39-Superior Sterling Heights

Product 7920-INTERMED AGG P1M LS

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

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)	99.2	%	
	1/2" (12.5mm)	76.9	%	
	3/8" (9.5mm)	51.7	%	
	#4 (4.75mm)	11.6	%	
	#8 (2.36mm)	4.1	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.8	%	
	#50 (.3mm)	2.7	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	2.15	%	

Plant S39-Superior Sterling Heights

Product 7919-COARSE AGG P1M LS

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	98.1	%	
	1" (25mm)	56.5	%	
	3/4" (19mm)	20.8	%	
	1/2" (12.5mm)	8.8	%	
	3/8" (9.5mm)	6.4	%	
	#4 (4.75mm)	4.4	%	
	#8 (2.36mm)	3.8	%	
	#16 (1.18mm)	3.6	%	
	#30 (.6mm)	3.4	%	
	#50 (.3mm)	3.1	%	
	#100 (.15mm)	2.5	%	
	#200 (75µm)	2.1	%	
	Wash Loss (#200/75um)	1.9	%	0-2
	Total Moisture	1.62	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-O2

Sample Date: 7/25/22

Dates Test Represents: 7/26/2022 through 8/1/2022

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	950	5.81	2.62	30.9
IA	71-47	Presque Isle	870	5.32	2.62	28.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
		Total Wt	**3070**	**18.69**		100.0

<----- 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"	96.7	100.0	100.0	99.0	1.0	1.0
1"	34.8	100.0	100.0	79.8	19.2	20.2
3/4"	6.6	98.4	100.0	70.6	9.2	29.4
1/2"	1.7	83.9	100.0	65.0	5.6	35.0
3/8"	1.7	63.8	100.0	59.3	5.7	40.7
#4	1.7	17.6	95.7	44.5	14.8	55.5
#8	1.6	6.3	74.9	32.8	11.7	67.2
#16	1.5	4.2	57.5	25.1	7.7	74.9
#30	1.5	3.6	42.1	18.6	6.4	81.4
#50	1.4	3.3	23.4	10.9	7.7	89.1
#100	1.3	3.0	7.7	4.4	6.5	95.6
LBW	1.0	2.7	1.5	1.7	2.7	98.3

*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.

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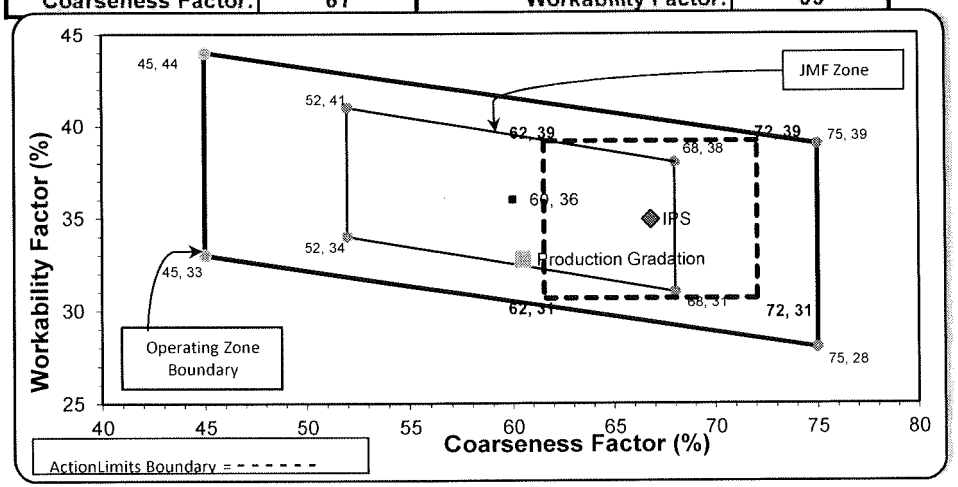
Production Gradation ◉ Batch Plant Gradations ○ Aggregate SupplierGradations

Coarseness Factor:	61	Workability Factor:	33



Intial Production Sample (IPS)

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"	72.3	12.7	27.7
1/2"	64.5	7.8	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 S02-Superior Hoover

Product 1022-2NS GR

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

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)	74.9	%	65-95
	#16 (1.18mm)	57.5	%	35-75
	#30 (.6mm)	42.1	%	20-55
	#50 (.3mm)	23.4	%	10-30
	#100 (.15mm)	7.7	%	0-10
	#200 (75µm)	1.9	%	
	FM	2.99		2.6-3
	Wash Loss (#200/75um)	1.5	%	0-3
	Total Moisture	5.43	%	

Plant S02-Superior Hoover

Product 7920-INTERMED AGG P1M LS

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

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)	98.4	%	
	1/2" (12.5mm)	83.9	%	
	3/8" (9.5mm)	63.8	%	
	#4 (4.75mm)	17.6	%	
	#8 (2.36mm)	6.3	%	
	#16 (1.18mm)	4.2	%	
	#30 (.6mm)	3.6	%	
	#50 (.3mm)	3.3	%	
	#100 (.15mm)	3.0	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.7	%	0-3
	Total Moisture	3.44	%	

Plant S02-Superior Hoover

Product 7919-COARSE AGG P1M LS

Period: 07/24/2022 - 07/30/2022

Name/Title Doug Storey / QC Technician

Report Date 07/29/2022

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.7	%	
	1" (25mm)	34.8	%	
	3/4" (19mm)	6.6	%	
	1/2" (12.5mm)	1.7	%	
	3/8" (9.5mm)	1.7	%	
	#4 (4.75mm)	1.7	%	
	#8 (2.36mm)	1.6	%	
	#16 (1.18mm)	1.5	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.1	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	1.74	%	