Sample Date:

Dates Test Represents:

9/21/20 P₁M Concrete Grade:

9/22/2020	through	9/28/2020		
Source	Weight (SSD)	ft ³	Specific	%
Source	weight (SSD)	11	Gravity	Contribution
Presque Isle	920	5.63	2.62	30.0
Dragaria Iala		F 04	2.02	20.0

Contractor:

MDOT No.:

S Agg. Class Pit# CA 71-47 Pres IΑ 71-47 Presque Isle 30.9 2NS 75-051 Mid-Michigan 1200 7.23 2.66 39.1

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

	Total Wt	3070	18.67		100.0	< Verify this n	umber is 100%
Sieve	CA	I.	A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	98.0	10	0.0	100.0	99.4	0.6	0.6
1"	42.8	10	0.0	100.0	82.9	16.5	17.1
3/4"	13.6	99	9.0	100.0	73.8	9.1	26.2
1/2"	4.2	80).3	100.0	65.2	8.6	34.8
3/8"	3.4	57	7.1	100.0	57.8	7.4	42.2
#4	2.7	12	2.0	98.6	43.1	14.7	56.9
#8	2.4	4	.0	83.2	34.5	8.6	65.5
#16	2.2	2	.6	66.5	27.5	7.0	72.5
#30	2.1	2	.3	50.5	21.1	6.4	78.9
#50	2.0	2	.2	26.7	11.7	9.4	88.3
#100	1.8	2	.1	6.5	3.7	8.0	96.3
LBW	1.5	1	.8	0.9	1.4	2.4	98.6

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

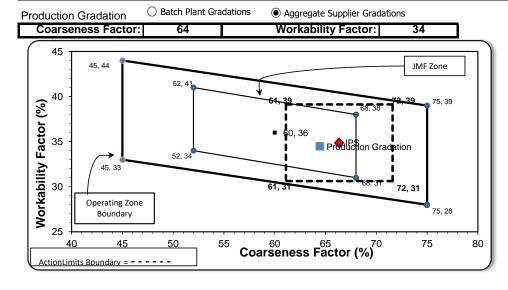
nom. max., #100 and #200 sieves.

*% 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.



Initial Production Sample (IPS)

Coars	Coarseness Factor:		
Work	Workability Factor:		
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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:

Sample Date:

9/21/20 P₁M Concrete Grade: 9/22/2020 9/28/2020

Contractor:

Dates Test F	Represents:	9/22/2020	through	9/28/2020		
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1420	8.46	2.69	45.5
IA	58-003	Stoneco	500	2.98	2.69	16.0
2NS	63-114	Highland	1200	7.26	2.65	38.5

MDOT No.:

SUPERIOR MATERIALS

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

Farmington Hills, MI 48336

	Total Wt	3120	18.70		100.0	< Verify this n	umber is 100%
Sieve	CA	L	A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	100.0	10	0.0	100.0	100.0	0.0	0.0
1"	64.6	10	0.0	100.0	83.9	16.1	16.1
3/4"	36.0	10	0.0	100.0	70.9	13.0	29.1
1/2"	14.8	93	3.8	100.0	60.2	10.6	39.8
3/8"	4.4	84	1.2	100.0	54.0	6.3	46.0
#4	1.6	17	7.6	99.2	41.7	12.3	58.3
#8	1.3	6	.1	85.2	34.3	7.4	65.7
#16	1.2	2	.7	67.3	26.9	7.5	73.1
#30	1.1	1	.8	46.7	18.8	8.1	81.2
#50	1.0	1	.7	16.2	7.0	11.8	93.0
#100	0.9	1	.6	2.8	1.7	5.2	98.3
LBW	0.8	1	.3	0.3	0.7	1.1	99.3

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

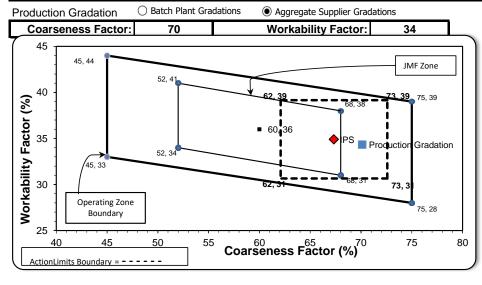
nom. max., #100 and #200 sieves.

*% 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.



Intial Production Sample (IPS)

Coars	Coarseness Factor:		
Work	Workability Factor:		
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

Cumulative

% Passing

20.5

10.4

2.9

Aggregate Optimization Chart

CA

2.1

2.0

1.8

PLANT #:

Sieve

#30

#50

#100

P-12 9/21/20 P1M Sample Date: Concrete Grade:

2NS

47.2

22.6

4.3

MDOT No	

% Retained

6.7

10.1

7.5

1.7

Contractor:



IΑ

2.3

2.2

2.1

---- Verify this number is 100%

Cumulative

% Retained

79.5

89.6

97.1

98.8

SUPERIOR MATERIALS

Production Gradation Report

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

Farmington Hills, MI 48336

2"	100.0	100.0	100.0	100.0	0.0	0.0	ı
1.5"	98.0	100.0	100.0	99.4	0.6	0.6	ı
1"	42.8	100.0	100.0	82.9	16.5	17.1	ı
3/4"	13.6	99.0	100.0	73.8	9.0	26.2	i
1/2"	4.2	80.3	100.0	65.5	8.3	34.5	i
3/8"	3.4	57.1	100.0	58.5	7.0	41.5	i
#4	2.7	12.0	98.0	44.2	14.2	55.8	ı
#8	2.4	4.0	80.5	34.7	9.6	65.3	n
#16	22	2.6	63.3	27.2	7.5	72.8	1

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

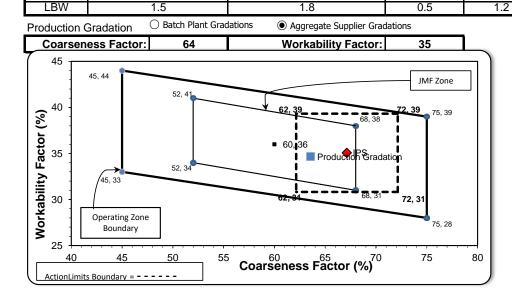
nom. max., #100 and #200 sieves.

*% 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.



Intial Production Sample (IPS)

Coars	Coarseness Factor:		
Work	ability Factor:	35	
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

PLANT #: P-20 Sample Date:

9/21/20 P1M Concrete Grade: 9/28/2020

Contractor:

MDOT No.:

Dates Test F	Represents:	9/22/2020	through	9/28/2020		
Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

Agg. Class	Pit #	Source	Weight (SSD) ft	ft ³	Specific	%
Agg. Olass		Godice		rreight (665)	1.	Gravity
CA	71-47	Presque Isle	870	5.32	2.62	28.3
IA	71-47	Presque Isle	1000	6.12	2.62	32.6
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

SUPERIOR MATERIALS	2

Superior Materials, LLC 30701 W. 10 Mile Rd.

Suite 500

Farmington Hills, MI 48336

	Total Wt	3070	18.70		100.0	< Verify this n	umber is 100%
Sieve	CA	IA		2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100	0.0	100.0	100.0	0.0	0.0
1.5"	98.0	100	0.0	100.0	99.4	0.6	0.6
1"	41.5	100	0.0	100.0	83.4	16.0	16.6
3/4"	11.3	98.3		100.0	74.3	9.1	25.7
1/2"	2.6	78	78.3		65.3	9.0	34.7
3/8"	1.8	52	.5	100.0	56.7	8.6	43.3
#4	1.4	7.	6	97.5	41.0	15.7	59.0
#8	1.3	3.	7	85.0	34.8	6.2	65.2 r
#16	1.2	2.	7	70.0	28.6	6.2	71.4
#30	1.2	2.4		49.7	20.5	8.0	79.5 r
#50	1.1	2.3		20.6	9.1	11.4	90.9
#100	1.0	2.2		2.8	2.1	7.0	97.9
LBW	0.9	2.	0	0.5	1.1	1.0	98.9

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

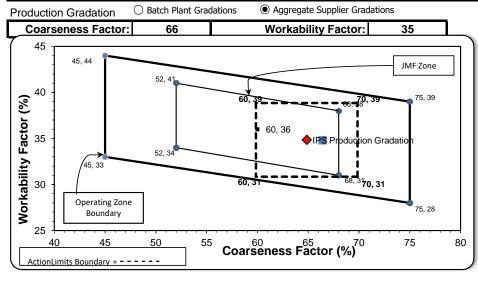
nom. max., #100 and #200 sieves.

*% 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.



Intial Production Sample (IPS)

Coars	eness Factor:	65	
Work	ability Factor:	35	
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

9/22/2020

PLANT #: P-32

Sample Date:

#100

Dates Test Represents:

9/21/20 Concrete Grade: P1M

9/28/2020

MDOT No.:

Contractor:

	Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
ľ	CA	71-47	Presque Isle	920	5.63	2.62	30.0
ľ	IA	71-47	Presque Isle	900	5.50	2.62	29.3
ľ	2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
I			Total Wt	3070	18.69		100.0

2.1

through

	C

Superior Materials, LLC

30701 W. 10 Mile Rd. Suite 500

Farmington Hills, MI 48336

	Total Wt	3070	18.69		100.0	< Verify this n	umber is 100%	
Sieve	CA	I.	4	2NS	Cumulative % Passing	% Retained	Cumulative % Retained	
2"	100.0	10	0.0	100.0	100.0	0.0	0.0	
1.5"	98.0	10	0.0	100.0	99.4	0.6	0.6	
1"	42.8	10	0.0	100.0	82.9	16.5	17.1	1
3/4"	13.6	99	0.0	100.0	73.8	9.0	26.2	
1/2"	4.2	80).3	100.0	65.5	8.3	34.5	
3/8"	3.4	57	' .1	100.0	58.5	7.0	41.5	*N
#4	2.7	12	2.0	96.4	43.6	14.9	56.4	*A
#8	2.4	4	.0	83.5	35.9	7.7	64.1	non
#16	2.2	2	.6	67.3	28.8	7.1	71.2	*%
#30	2.1	2	.3	45.4	19.8	9.0	80.2	non
#50	2.0	2	.2	22.0	10.2	9.6	89.8	*0/

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

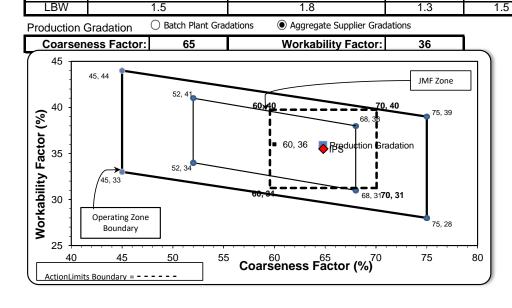
om. max., #100 and #200 sieves.

 $\ensuremath{^{*}\%}$ 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.



Intial Production Sample (IPS)

96.1

98.5

6.3

3.9

6.7

Coars	eness Factor:	65	
Work	ability Factor:	36	
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

1.8

Approved By:

Sample Date:

Dates Test Represents:

9/21/20 P1M Concrete Grade: 9/22/2020 9/28/2020

!!
MDO.

Contractor:

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
2NS	63-92	Grange Hall	1200	7.26	2.65	39.1
		Total Wt	3070	18.70		100.0

through

MDOT No.:

SUPERIOR MATERIALS	

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

	i otai wt	3070	18.70		100.0	< Verify this n	umber is 100%
Sieve	CA	I,	4	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	98.0	10	0.0	100.0	99.4	0.6	0.6
1"	42.8	10	0.0	100.0	83.2	16.2	16.8
3/4"	13.6	99	0.0	100.0	74.4	8.9	25.6
1/2"	4.2	80).3	100.0	65.7	8.7	34.3
3/8"	3.4	57	' .1	100.0	58.1	7.6	41.9
#4	2.7	12	2.0	97.5	42.7	15.4	57.3
#8	2.4	4.	.0	85.0	35.2	7.5	64.8
#16	2.2	2	.6	70.0	28.8	6.4	71.2
#30	2.1	2	.3	49.7	20.8	8.1	79.2
#50	2.0	2	.2	20.6	9.3	11.4	90.7
#100	1.8	2	.1	2.8	2.3	7.0	97.7
LBW	1.5	1.	.8	0.5	1.2	1.1	98.8

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

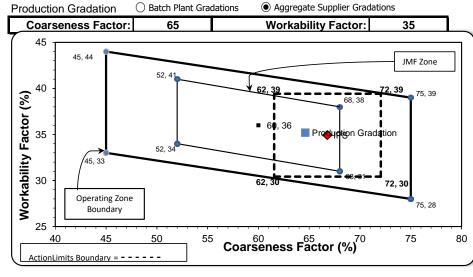
nom. max., #100 and #200 sieves.

*% 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.



Intial Production Sample (IPS)

Coars	Coarseness Factor:		
Work	Workability Factor:		
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

PLANT #: P-39 Sample Date:

9/21/20 Concrete Grade: 9/22/2020 9/28/2020 through

P1M

MDOT No.:

Contractor:

Dates Test F	Represents:	9/22/2020	through	9/28/2020		
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	950	5.81	2.62	30.9
2NS	44-051	Krake Willis Rd	1220	7.38	2.65	39.7
		Total Wt	3070	18 60		100.0

Gravity	Continuation	
2.62	29.3	
2.62	30.9	
2.65	39.7	
	100.0	<-

SUPE	RIOR

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

	Total Wt	3070	18.69		100.0	< Verify this n	umber is 100%
Sieve	CA	1/	4	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	10	0.0	100.0	100.0	0.0	0.0
1.5"	98.0	10	0.0	100.0	99.4	0.6	0.6
1"	42.8	10	0.0	100.0	83.2	16.2	16.8
3/4"	13.6	99	0.0	100.0	74.4	8.9	25.6
1/2"	4.2	80).3	100.0	65.8	8.5	34.2
3/8"	3.4	57	'.1	100.0	58.4	7.4	41.6
#4	2.7	12	2.0	95.3	42.4	16.0	57.6
#8	2.4	4	.0	81.7	34.4	8.0	65.6
#16	2.2	2	.6	66.6	27.9	6.5	72.1
#30	2.1	2	3	51.4	21.8	6.2	78.2
#50	2.0	2	2	24.4	11.0	10.8	89.0
#100	1.8	2	1	8.0	4.4	6.6	95.6
LBW	1.5	1.	.8	1.4	1.6	2.8	98.4

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

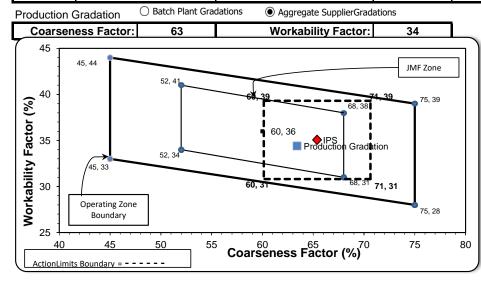
nom. max., #100 and #200 sieves.

*% 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.



Intial Production Sample (IPS)

Coars	Coarseness Factor:		
Work	Workability Factor:		
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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

Sample Date:

9/21/20 P1M Concrete Grade:

Contractor:

Dates Test Represents: 9/22/2020 9/28/2020 through

Agg. Class	Pit#	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
CA	71-47	Presque Isle	920	5.63	2.62	30.0
IA	71-47	Presque Isle	900	5.50	2.62	29.3
2NS	63-115	Ray Rd	1250	7.56	2.65	40.7
		Total Wt	3070	18.69		100.0

MDOT No.:

--- Verify this number is 100%

SUPERIOR MATERIALS	

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

	i Otai Wi	10.00		100.0	· voilly allow	umber 13 10070
Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	98.0	100.0	100.0	99.4	0.6	0.6
1"	42.8	100.0	100.0	82.9	16.5	17.1
3/4"	13.6	99.0	100.0	73.8	9.0	26.2
1/2"	4.2	80.3	100.0	65.5	8.3	34.5
3/8"	3.4	57.1	100.0	58.5	7.0	41.5
#4	2.7	12.0	98.0	44.2	14.2	55.8
#8	2.4	4.0	80.5	34.7	9.6	65.3
#16	2.2	2.6	63.3	27.2	7.5	72.8
#30	2.1	2.3	47.2	20.5	6.7	79.5
#50	2.0	2.2	22.6	10.4	10.1	89.6
#100	1.8	2.1	4.3	2.9	7.5	97.1
LBW	1.5	1.8	0.5	1.2	1.7	98.8

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

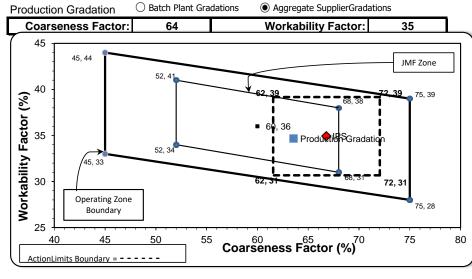
nom. max., #100 and #200 sieves.

*% 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.



Intial Production Sample (IPS)

Coars	Coarseness Factor:		
Work	Workability Factor:		
Sieve	Cumulative	%	Cumulative
Sieve	% Passing	Retained	% 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: