Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Contractor: _____

Sample Date: 8/9/21

Concrete Grade: **P1M**

Dates Test Represents: 8/10/2021 through 8/16/2021

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	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"	96.0	100.0	100.0	98.8	1.2	1.2
1"	40.7	100.0	100.0	81.6	17.1	18.4
3/4"	12.8	98.4	100.0	72.6	9.1	27.4
1/2"	6.2	80.5	100.0	65.4	7.1	34.6
3/8"	4.7	56.8	100.0	58.3	7.2	41.7
#4	3.1	14.4	97.0	44.5	13.7	55.5
#8	2.7	5.1	85.2	37.0	7.6	63.0
#16	2.4	3.4	71.2	30.7	6.3	69.3
#30	2.3	2.9	50.5	22.1	8.6	77.9
#50	2.0	2.6	23.8	11.0	11.0	89.0
#100	1.7	2.3	6.9	4.0	7.1	96.0
LBW	1.0	1.6	0.9	1.1	2.9	98.9

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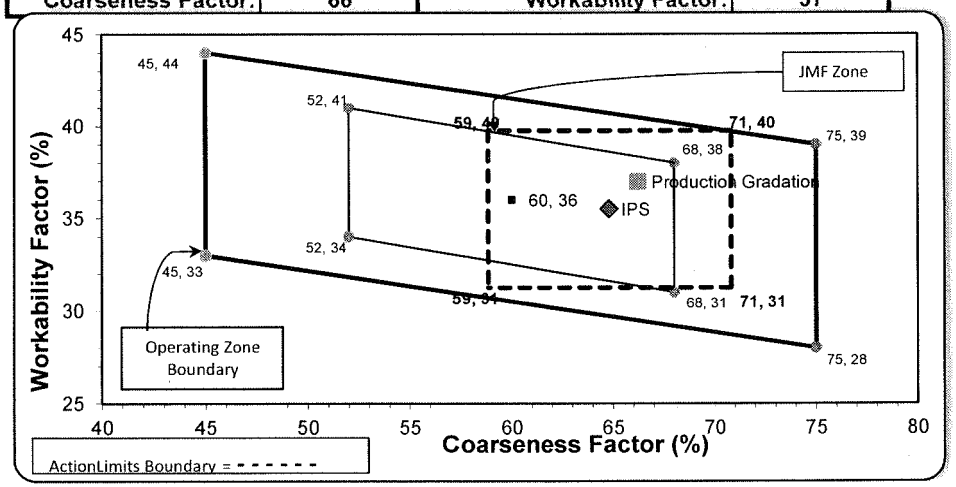
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	66	Workability Factor:	37



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: 08/08/2021 - 08/14/2021

Name/Title Doug Storey / QC Technician

Report Date 08/13/2021

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)	85.2	%	65-95
	#16 (1.18mm)	71.2	%	35-75
	#30 (.6mm)	50.5	%	20-55
	#50 (.3mm)	23.8	%	10-30
	#100 (.15mm)	6.9	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.65		2.6-3
	Wash Loss (#200/75um)	0.9	%	0-3
	Total Moisture	3.8	%	

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Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Period: 08/08/2021 - 08/14/2021

Name/Title Doug Storey / QC Technician

Report Date 08/13/2021

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)	80.5	%	
	3/8" (9.5mm)	56.8	%	
	#4 (4.75mm)	14.4	%	
	#8 (2.36mm)	5.1	%	
	#16 (1.18mm)	3.4	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.6	%	
	#100 (.15mm)	2.3	%	
	#200 (75µm)	1.9	%	
	Wash Loss (#200/75um)	1.6	%	0-3
	Total Moisture	0.0	%	

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Detroit, 48209
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Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Period: 08/08/2021 - 08/14/2021

Name/Title Doug Storey / QC Technician

Report Date 08/13/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.0	%	
	1" (25mm)	40.7	%	
	3/4" (19mm)	12.8	%	
	1/2" (12.5mm)	6.2	%	
	3/8" (9.5mm)	4.7	%	
	#4 (4.75mm)	3.1	%	
	#8 (2.36mm)	2.7	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.0	%	0-2
	Total Moisture	1.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-35 ORIGINAL PROPORTIONS Contractor: _____

Sample Date: 8/9/21 Concrete Grade: **P1M**

Dates Test Represents: 8/10/2021 through 8/16/2021 MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	Specific Gravity	% Contribution
CA	58-003	Stoneco	1470	8.76	2.69	47.1
IA	58-003	Stoneco	450	2.68	2.69	14.4
2NS	81-093	Burmeister	1200	7.26	2.65	38.5
		Total Wt	**3120**	**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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	58.8	100.0	100.0	80.6	19.4	19.4
3/4"	24.7	100.0	100.0	64.5	16.1	35.5
1/2"	8.8	91.0	100.0	55.7	8.8	44.3
3/8"	3.7	62.7	100.0	49.2	6.5	50.8
#4	1.4	16.1	99.2	41.1	8.1	58.9
#8	1.2	5.2	84.8	33.9	7.2	66.1
#16	1.0	3.0	67.1	26.7	7.2	73.3
#30	1.0	2.2	45.4	18.3	8.5	81.8
#50	0.9	1.9	17.8	7.5	10.7	92.5
#100	0.8	1.7	4.9	2.5	5.0	97.5
LBW	0.5	1.4	1.0	0.8	1.7	99.2

*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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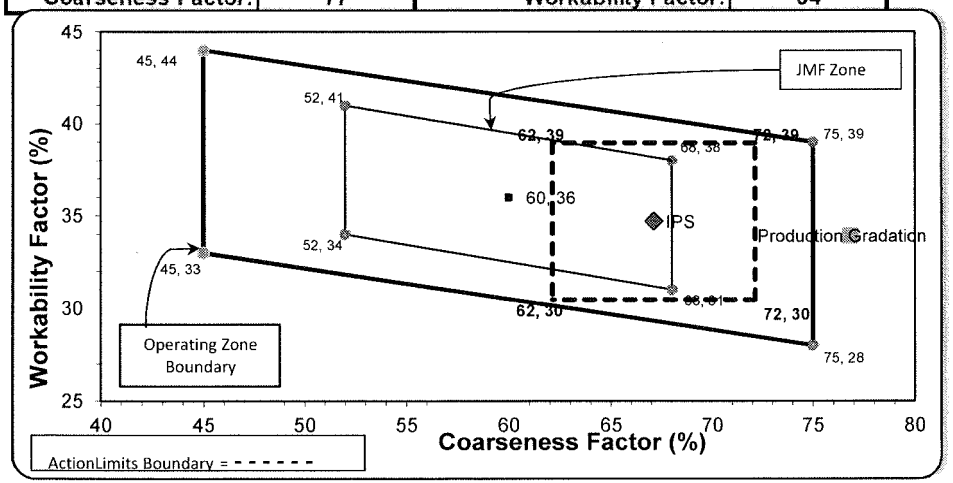
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	77	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"	86.9	13.1	13.1
3/4"	76.1	10.8	23.9
1/2"	63.7	12.4	36.3
3/8"	56.2	7.5	43.8
#4	43.2	13.0	56.8
#8	34.7	8.5	65.3
#16	27.5	7.2	72.5
#30	20.6	7.0	79.4
#50	9.0	11.6	91.0
#100	2.1	6.9	97.9
LBW	1.0	1.1	99.0

PREPARED BY:
SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-35 ADJUSTED PROPORTIONS

Contractor: _____

Sample Date: 8/9/21

Concrete Grade: P1M

Dates Test Represents: 8/10/2021 through 8/16/2021

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft³	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	81-093	Burmeister	1200	7.26	2.65	38.5
		Total Wt	3120	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"	100.0	100.0	100.0	100.0	0.0	0.0
1"	65.0	100.0	100.0	84.6	15.4	15.4
3/4"	44.2	100.0	100.0	75.5	9.1	24.5
1/2"	18.1	92.7	100.0	62.8	12.7	37.2
3/8"	7.7	83.0	100.0	56.5	6.3	43.5
#4	1.9	27.6	98.8	43.7	12.8	56.3
#8	1.3	6.5	86.3	34.9	8.8	65.1
#16	1.1	2.7	70.5	28.1	6.8	71.9
#30	1.0	1.9	51.6	20.6	7.5	79.4
#50	0.9	1.7	17.9	7.6	13.0	92.4
#100	0.8	1.6	3.1	1.8	5.8	98.2
LBW	0.8	1.2	1.0	0.9	0.9	99.1

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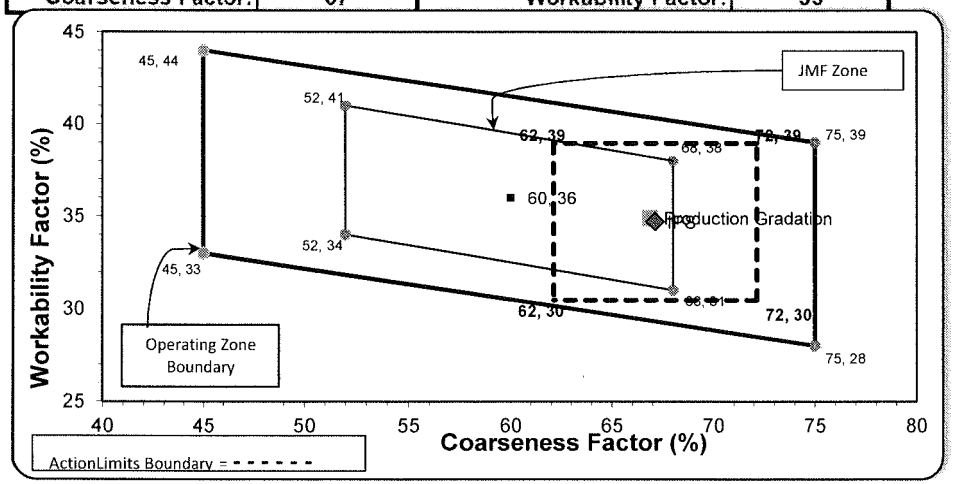
Farmington Hills, MI 48336

*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:	67	Workability Factor:	35



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"	86.9	13.1	13.1
3/4"	76.1	10.8	23.9
1/2"	63.7	12.4	36.3
3/8"	56.2	7.5	43.8
#4	43.2	13.0	56.8
#8	34.7	8.5	65.3
#16	27.5	7.2	72.5
#30	20.6	7.0	79.4
#50	9.0	11.6	91.0
#100	2.1	6.9	97.9
LBW	1.0	1.1	99.0

PREPARED BY:
SM, LLC Technical Service

Approved By:

SUPERIOR MATERIALS

Plant S35-Superior Romulus

Product 1022-2NS GR

Period: 08/08/2021 - 08/14/2021

Name/Title Doug Storey / QC Technician

Report Date 08/13/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.2	%	95-100
	#8 (2.36mm)	84.8	%	65-95
	#16 (1.18mm)	67.1	%	35-75
	#30 (.6mm)	45.4	%	20-55
	#50 (.3mm)	17.8	%	10-30
	#100 (.15mm)	4.9	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.81		2.6-3
AASHTO T11	-#200 (75um)	1.27	%	
	Wash Loss (#200/75um)	1.0	%	0-3
ASTM C566	Total Moisture	3.49	%	

Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Period: 08/08/2021 - 08/14/2021

Name/Title Doug Storey / QC Technician

Report Date 08/13/2021

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)	91.0	%	
	3/8" (9.5mm)	62.7	%	
	#4 (4.75mm)	16.1	%	
	#8 (2.36mm)	5.2	%	
	#16 (1.18mm)	3.0	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	1.9	%	
	#100 (.15mm)	1.7	%	
	#200 (75µm)	1.6	%	
	Wash Loss (#200/75um)	1.4	%	0-3
ASTM C566	Total Moisture	2.04	%	

Plant S35-Superior Romulus

Product 7919-COARSE AGG P1M LS

Period: 08/08/2021 - 08/14/2021

Name/Title Doug Storey / QC Technician

Report Date 08/13/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	58.8	%	
	3/4" (19mm)	24.7	%	
	1/2" (12.5mm)	8.8	%	
	3/8" (9.5mm)	3.7	%	
	#4 (4.75mm)	1.4	%	
	#8 (2.36mm)	1.2	%	
	#16 (1.18mm)	1.0	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	0.9	%	
	#100 (.15mm)	0.8	%	
	#200 (75µm)	0.6	%	
	Wash Loss (#200/75um)	0.5	%	0-2
ASTM C566	Total Moisture	0.94	%	