Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-32

Sample Date: 9/27/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 9/28/2021 through 10/4/2021

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"	93.8	100.0	100.0	98.1	1.9	1.9
1"	27.4	100.0	100.0	77.5	20.5	22.5
3/4"	7.8	100.0	100.0	71.5	6.1	28.5
1/2"	3.0	76.2	100.0	63.2	8.2	36.8
3/8"	2.8	53.6	100.0	56.8	6.5	43.2
#4	2.7	15.0	96.2	44.3	12.5	55.7
#8	2.6	7.2	85.2	37.5	6.7	62.5
#16	2.6	4.6	71.2	31.1	6.4	68.9
#30	2.5	3.7	53.6	23.6	7.5	76.4
#50	2.4	3.2	26.0	12.2	11.4	87.8
#100	2.2	2.9	6.8	4.3	8.0	95.7
LBW	1.6	2.1	1.2	1.6	2.7	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.

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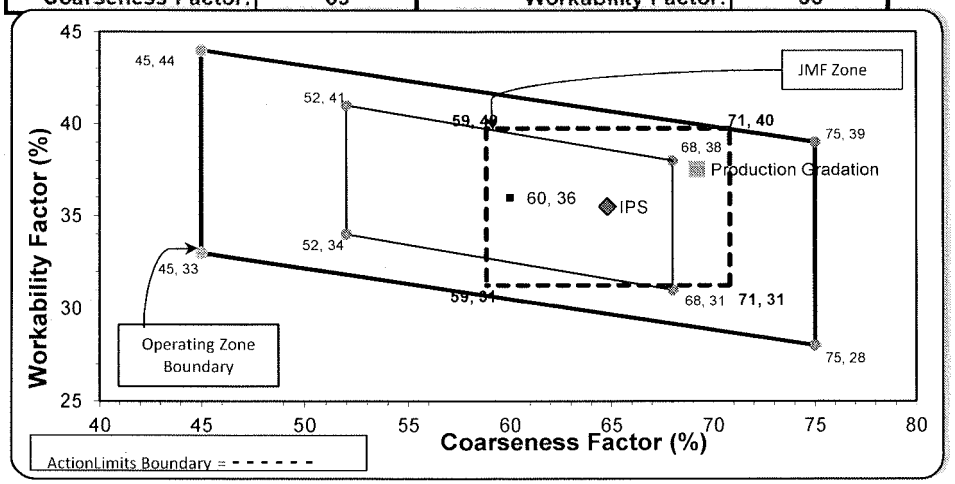
Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	69	Workability Factor:	38



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.

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Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Period: 09/26/2021 - 10/02/2021

Name/Title Doug Storey / QC Technician

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.2	%	95-100
	#8 (2.36mm)	85.2	%	65-95
	#16 (1.18mm)	71.2	%	35-75
	#30 (.6mm)	53.6	%	20-55
	#50 (.3mm)	26.0	%	10-30
	#100 (.15mm)	6.8	%	0-10
	#200 (75µm)	1.8	%	
	FM	2.61		2.6-3
	Wash Loss (#200/75um)	1.2	%	0-3
	Total Moisture	3.6	%	

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Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 09/26/2021 - 10/02/2021

Report Date 10/01/2021

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)	100.0	%	
	1/2" (12.5mm)	76.2	%	
	3/8" (9.5mm)	53.6	%	
	#4 (4.75mm)	15.0	%	
	#8 (2.36mm)	7.2	%	
	#16 (1.18mm)	4.6	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.2	%	
	#100 (.15mm)	2.9	%	
	#200 (75µm)	2.4	%	
	Wash Loss (#200/75um)	2.1	%	0-3
	Total Moisture	2.0	%	

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Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Period: 09/26/2021 - 10/02/2021

Name/Title Doug Storey / QC Technician

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	93.8	%	
	1" (25mm)	27.4	%	
	3/4" (19mm)	7.8	%	
	1/2" (12.5mm)	3.0	%	
	3/8" (9.5mm)	2.8	%	
	#4 (4.75mm)	2.7	%	
	#8 (2.36mm)	2.6	%	
	#16 (1.18mm)	2.6	%	
	#30 (.6mm)	2.5	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.6	%	0-2
	Total Moisture	2.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-35

Sample Date: 9/27/21

Concrete Grade: **P1M**

Contractor: _____

Dates Test Represents: 9/28/2021 through 10/4/2021

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"	63.5	100.0	100.0	84.0	16.0	16.0
3/4"	29.2	100.0	100.0	68.9	15.1	31.1
1/2"	12.5	90.7	100.0	59.9	9.0	40.1
3/8"	7.5	70.2	100.0	54.1	5.8	45.9
#4	2.4	23.4	98.9	43.2	10.9	56.8
#8	1.7	7.7	87.8	35.9	7.3	64.1
#16	1.6	4.1	73.2	29.6	6.3	70.4
#30	1.5	2.9	52.6	21.4	8.2	78.6
#50	1.4	2.4	18.0	8.0	13.4	92.0
#100	1.3	2.2	3.4	2.3	5.7	97.7
LBW	1.1	2.0	0.8	1.1	1.1	98.9

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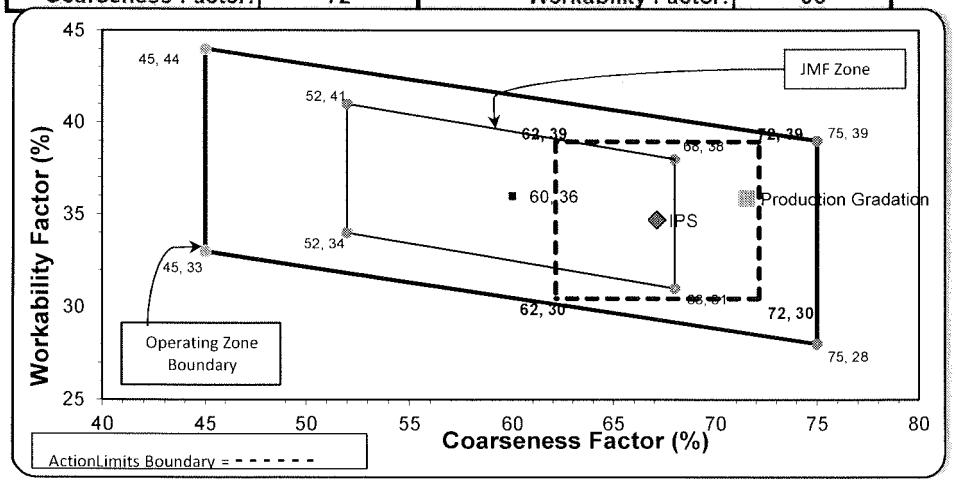
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation ◉ Batch Plant Gradations ○ Aggregate Supplier Gradations

Coarseness Factor:	72	Workability Factor:	36



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:

Plant S35-Superior Romulus

Product 1022-2NS GR

Period: 09/26/2021 - 10/02/2021

Name/Title Doug Storey / QC Technician

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	98.9	%	95-100
	#8 (2.36mm)	87.8	%	65-95
	#16 (1.18mm)	73.2	%	35-75
	#30 (.6mm)	52.6	%	20-55
	#50 (.3mm)	18.0	%	10-30
	#100 (.15mm)	3.4	%	0-10
	#200 (75µm)	1.0	%	
	FM	2.66		2.6-3
AASHTO T11	-#200 (75um)	1.02	%	
	Wash Loss (#200/75um)	0.8	%	0-3
ASTM C566	Total Moisture	4.38	%	

Plant S35-Superior Romulus

Product 7920-INTERMED AGG P1M LS

Period: 09/26/2021 - 10/02/2021

Name/Title Doug Storey / QC Technician

Report Date 10/01/2021

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)	90.7	%	
	3/8" (9.5mm)	70.2	%	
	#4 (4.75mm)	23.4	%	
	#8 (2.36mm)	7.7	%	
	#16 (1.18mm)	4.1	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.4	%	
	#100 (.15mm)	2.2	%	
	#200 (75µm)	2.0	%	
	Wash Loss (#200/75um)	2.0	%	0-3
ASTM C566	Total Moisture	2.37	%	

Plant S35-Superior Romulus

Product 7919-COARSE AGG P1M LS

Period: 09/26/2021 - 10/02/2021

Name/Title Doug Storey / QC Technician

Report Date 10/01/2021

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	63.5	%	
	3/4" (19mm)	29.2	%	
	1/2" (12.5mm)	12.5	%	
	3/8" (9.5mm)	7.5	%	
	#4 (4.75mm)	2.4	%	
	#8 (2.36mm)	1.7	%	
	#16 (1.18mm)	1.6	%	
	#30 (.6mm)	1.5	%	
	#50 (.3mm)	1.4	%	
	#100 (.15mm)	1.3	%	
	#200 (75µm)	1.2	%	
	Wash Loss (#200/75um)	1.1	%	0-2
ASTM C566	Total Moisture	1.45	%	