

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P11**

Contractor: _____

Sample Date: **6/5/23**

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: **6/6/2023** through **6/12/2023**

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	850	5.20	2.62	27.7
NNS	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	NNS	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"	34.0	100.0	100.0	79.1	19.8	20.9
3/4"	9.5	98.0	100.0	70.9	8.3	29.1
1/2"	3.7	74.9	100.0	62.6	8.2	37.4
3/8"	3.0	53.8	100.0	56.6	6.1	43.4
#4	2.6	12.2	97.3	43.8	12.7	56.2
#8	2.5	4.4	82.7	35.7	8.1	64.3
#16	2.4	3.2	68.0	29.3	6.3	70.7
#30	2.3	2.9	52.1	22.7	6.6	77.3
#50	2.2	2.8	26.7	12.3	10.4	87.7
#100	2.1	2.6	5.5	3.6	8.7	96.4
LBW	1.7	2.2	0.5	1.3	2.3	98.7

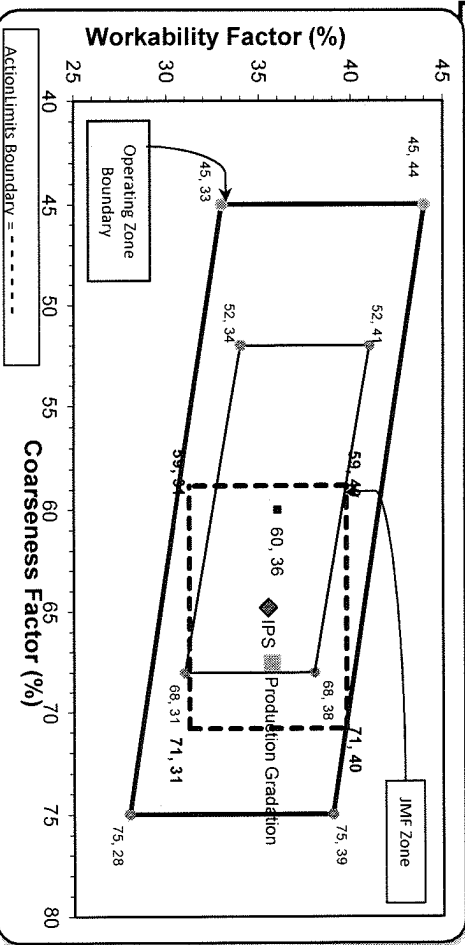
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max. nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max. nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **68** Workability Factor: **36**

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: _____



Plant S11-Superior Onsite Jefferson

Product 7919-COARSE AGG P1M LS

Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.7	%	
	1" (25mm)	34.0	%	
	3/4" (19mm)	9.5	%	
	1/2" (12.5mm)	3.7	%	
	3/8" (9.5mm)	3.0	%	
	#4 (4.75mm)	2.6	%	
	#8 (2.36mm)	2.5	%	
	#16 (1.18mm)	2.4	%	
	#30 (.6mm)	2.3	%	
	#50 (.3mm)	2.2	%	
	#100 (.15mm)	2.1	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-2
	Total Moisture	1.17	%	



Plant S11-Superior Onsite Jefferson

Product 7920-INTERMED AGG P1M LS

Name/Title Doug Storey / QC Technician

Period: 06/04/2023 - 06/10/2023

Report Date 06/10/2023

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)	98.0	%	
	1/2" (12.5mm)	74.9	%	
	3/8" (9.5mm)	53.8	%	
	#4 (4.75mm)	12.2	%	
	#8 (2.36mm)	4.4	%	
	#16 (1.18mm)	3.2	%	
	#30 (.6mm)	2.9	%	
	#50 (.3mm)	2.8	%	
	#100 (.15mm)	2.6	%	
	#200 (75µm)	2.3	%	
	Wash Loss (#200/75um)	2.2	%	0-3
	Total Moisture	3.13	%	



Plant S11-Superior Onsite Jefferson

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 06/04/2023 - 06/10/2023

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	97.3	%	95-100
	#8 (2.36mm)	82.7	%	65-95
	#16 (1.18mm)	68.0	%	35-75
	#30 (.6mm)	52.1	%	20-55
	#50 (.3mm)	26.7	%	10-30
	#100 (.15mm)	5.5	%	0-10
	#200 (75µm)	0.9	%	
	FM	2.68		2.6-3
	Wash Loss (#200/75um)	0.5	%	0-3
	Total Moisture	3.76	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Contractor: _____

Sample Date: **6/5/23**

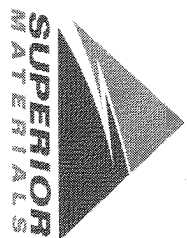
Concrete Grade: **P1M, 3500HP**

Dates Test Represents: **6/6/2023** through **6/12/2023**

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	Contribution %
CA	71-47	Presque Isle	970	5.93	2.62	31.6
IA	71-47	Presque Isle	850	5.20	2.62	27.7
2NS	95-013	Smelter Bay	1250	7.56	2.65	40.7
		Total Wt	3070			100.0

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.9	1.1	1.1
1"	41.6	100.0	100.0	81.5	17.3	18.5
3/4"	10.7	97.1	100.0	71.0	10.6	29.0
1/2"	1.7	69.8	100.0	60.6	10.4	39.4
3/8"	1.3	45.5	100.0	53.7	6.9	46.3
#4	1.0	9.7	96.4	42.3	11.5	57.7
#8	1.0	4.9	84.5	36.1	6.2	63.9
#16	1.0	4.0	69.1	29.6	6.5	70.4
#30	1.0	3.7	48.8	21.2	8.3	78.8
#50	1.0	3.5	23.0	10.6	10.6	89.4
#100	0.9	3.2	6.5	3.8	6.8	96.2
LBW	0.8	2.6	1.0	1.4	2.4	98.6



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

Sieve	CA	IA	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	96.5	100.0	100.0	98.9	1.1	1.1
1"	41.6	100.0	100.0	81.5	17.3	18.5
3/4"	10.7	97.1	100.0	71.0	10.6	29.0
1/2"	1.7	69.8	100.0	60.6	10.4	39.4
3/8"	1.3	45.5	100.0	53.7	6.9	46.3
#4	1.0	9.7	96.4	42.3	11.5	57.7
#8	1.0	4.9	84.5	36.1	6.2	63.9
#16	1.0	4.0	69.1	29.6	6.5	70.4
#30	1.0	3.7	48.8	21.2	8.3	78.8
#50	1.0	3.5	23.0	10.6	10.6	89.4
#100	0.9	3.2	6.5	3.8	6.8	96.2
LBW	0.8	2.6	1.0	1.4	2.4	98.6

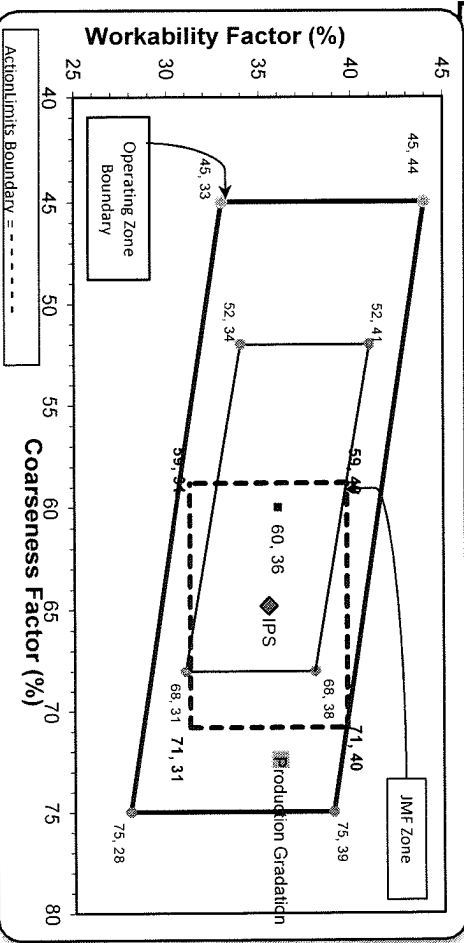
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max. #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max. #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Initial Production Sample (IPS)

Coarseness Factor: **72** Workability Factor: **36**

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: _____

Plant 958-JMT

Product 7919-COARSE AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 06/04/2023 - 06/10/2023

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS PI Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	96.5	%	
	1" (25mm)	41.6	%	
	3/4" (19mm)	10.7	%	
	1/2" (12.5mm)	1.7	%	
	3/8" (9.5mm)	1.3	%	
	#4 (4.75mm)	1.0	%	
	#8 (2.36mm)	1.0	%	
	#16 (1.18mm)	1.0	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.8	%	
	Wash Loss (#200/75µm)	0.8	%	0-2
	Total Moisture	0.1	%	

Plant 958-JMT

Product 7920-INTERMED AGG P1M LS PI

Name/Title Doug Storey / QC Technician

Period: 06/04/2023 - 06/10/2023

Report Date 06/10/2023

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)	97.1	%	
	1/2" (12.5mm)	69.8	%	
	3/8" (9.5mm)	45.5	%	
	#4 (4.75mm)	9.7	%	
	#8 (2.36mm)	4.9	%	
	#16 (1.18mm)	4.0	%	
	#30 (.6mm)	3.7	%	
	#50 (.3mm)	3.5	%	
	#100 (.15mm)	3.2	%	
	#200 (75µm)	2.8	%	
	Wash Loss (#200/75um)	2.6	%	0-3
	Total Moisture	1.1	%	

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 06/04/2023 - 06/10/2023

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	96.4	%	95-100
	#8 (2.36mm)	84.5	%	65-95
	#16 (1.18mm)	69.1	%	35-75
	#30 (.6mm)	48.8	%	20-55
	#50 (.3mm)	23.0	%	10-30
	#100 (.15mm)	6.5	%	0-10
	#200 (75µm)	1.3	%	
	FM	2.72		2.6-3
	Wash Loss (#200/75um)	1.0	%	0-3
	Total Moisture	4.4	%	

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

Sample Date: **6/5/23**

Dates Test Represents: **6/6/2023** through **6/12/2023**

Concrete Grade: **P1M, 3500HP**

Contractor: _____

MDOT No.: _____



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

Agg. Class	Pit #	Source	Weight (ssd)	ft ³	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	81-019	Pleasant Lake	1200	7.26	2.65	38.5
		Total Wt	3120	18.70		100.0

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"	67.6	100.0	100.0	85.8	14.2	14.2
3/4"	34.5	100.0	100.0	71.2	28.8	28.8
1/2"	18.8	86.8	100.0	62.0	38.0	38.0
3/8"	11.2	69.2	100.0	55.6	44.4	44.4
#4	1.9	20.6	99.7	42.8	57.2	57.2
#8	1.3	5.3	86.6	34.8	65.2	65.2
#16	1.1	2.7	69.7	27.8	72.2	72.2
#30	1.0	2.2	50.9	20.4	79.6	79.6
#50	1.0	2.0	25.0	10.4	89.6	89.6
#100	0.9	1.8	7.8	3.7	96.3	96.3
LBW	0.7	1.7	2.0	1.4	98.6	98.6

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

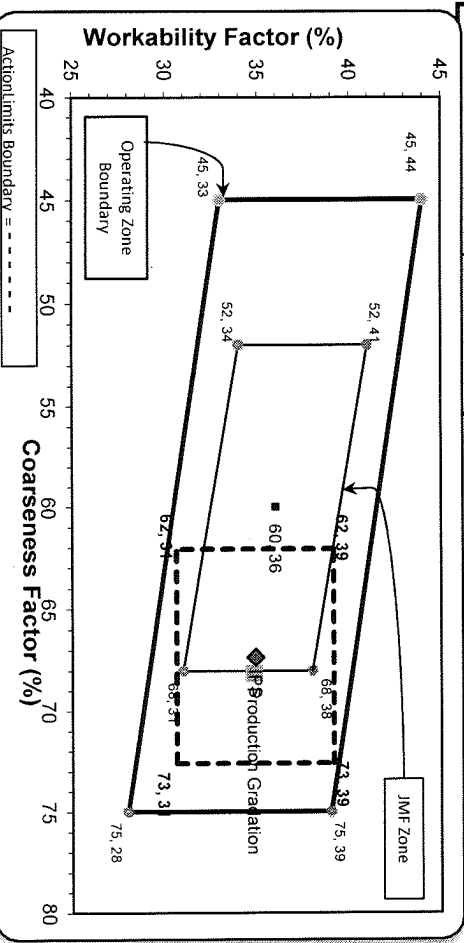
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 norm. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 norm. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when
 a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

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

Initial 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"	85.5	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

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi

Product 7919-COARSE AGG P1M LS

Period: 06/06/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	Coarse Agg P1M LS Target
	2" (50mm)	100.0	%	
	1 1/2" (37.5mm)	100.0	%	
	1" (25mm)	67.6	%	
	3/4" (19mm)	34.5	%	
	1/2" (12.5mm)	18.8	%	
	3/8" (9.5mm)	11.2	%	
	#4 (4.75mm)	1.9	%	
	#8 (2.36mm)	1.3	%	
	#16 (1.18mm)	1.1	%	
	#30 (.6mm)	1.0	%	
	#50 (.3mm)	1.0	%	
	#100 (.15mm)	0.9	%	
	#200 (75µm)	0.8	%	
	Wash Loss (#200/75um)	0.7	%	0-2
	Total Moisture	2.23	%	



Plant S102-Superior Novi

Product 7920-INTERMED AGG P1M LS

Period: 06/06/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician

Report Date 06/10/2023

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)	86.8	%	
	3/8" (9.5mm)	69.2	%	
	#4 (4.75mm)	20.6	%	
	#8 (2.36mm)	5.3	%	
	#16 (1.18mm)	2.7	%	
	#30 (.6mm)	2.2	%	
	#50 (.3mm)	2.0	%	
	#100 (.15mm)	1.8	%	
	#200 (75µm)	1.8	%	
	Wash Loss (#200/75um)	1.7	%	0-3
	Total Moisture	2.44	%	



Plant S102-Superior Novi
Product 1022-2NS GR
Period: 06/04/2023 - 06/10/2023

Name/Title Doug Storey / QC Technician
Report Date 06/10/2023

Procedure	Sieve/Test	Result	Unit	2NS GR Spec
	3/8" (9.5mm)	100.0	%	100-100
	#4 (4.75mm)	99.7	%	95-100
	#8 (2.36mm)	86.6	%	65-95
	#16 (1.18mm)	69.7	%	35-75
	#30 (.6mm)	50.9	%	20-55
	#50 (.3mm)	25.0	%	10-30
	#100 (.15mm)	7.8	%	0-10
	#200 (75µm)	2.3	%	
	FM	2.60		2.6-3
	Wash Loss (#200/75um)	2.0	%	0-3
	Total Moisture	3.46	%	