

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

Sample Date: 4/22/24

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1350	8.04	2.69	45.8
26A	58-003	Stoneco	450	2.68	2.69	15.3
2NS	63-114	Highland	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

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



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

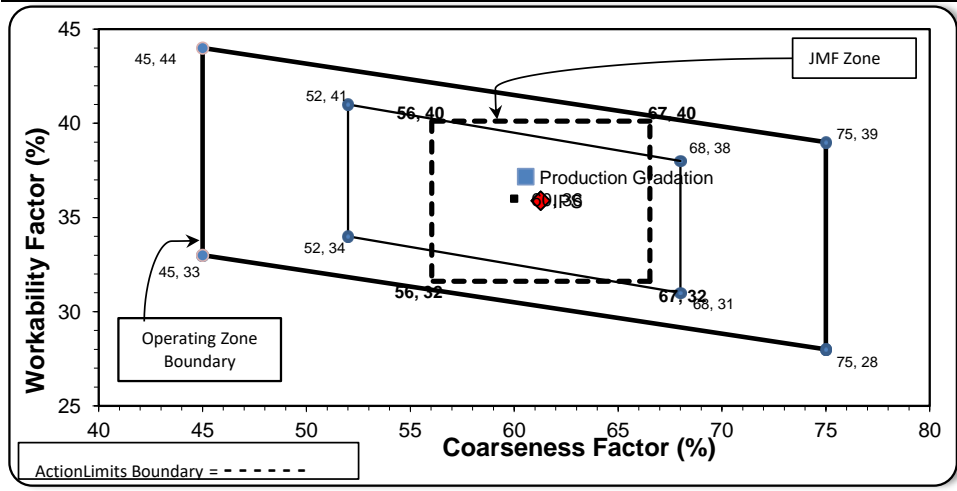
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	84.2	100.0	100.0	92.8	7.1	7.2
1/2"	41.1	97.9	100.0	72.7	20.0	27.3
3/8"	19.2	83.1	100.0	60.4	12.3	39.6
#4	3.7	12.2	99.1	42.2	18.3	57.8
#8	2.3	3.7	84.8	34.7	7.5	65.3
#16	2.0	2.4	65.5	26.8	7.9	73.2
#30	1.8	2.0	46.0	19.1	7.8	80.9
#50	1.7	1.8	19.2	8.5	10.5	91.5
#100	1.6	1.7	3.6	2.4	6.1	97.6
LBW	1.3	1.6	0.6	1.1	1.3	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	61	Workability Factor:	35	37.2
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Coarseness Factor:	61
Workability Factor:	36



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-103**

Sample Date: 4/22/24

Concrete Grade: **DM, 4500HP**

Contractor: _____

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1350	8.04	2.69	45.8
26A	58-003	Stoneco	450	2.68	2.69	15.3
2NS	63-114	Highland	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

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



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Sieve	6AA	26A	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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	84.2	100.0	100.0	92.8	7.1	7.2
1/2"	41.1	97.9	100.0	72.7	20.0	27.3
3/8"	19.2	83.1	100.0	60.4	12.3	39.6
#4	3.7	12.2	99.1	42.2	18.3	57.8
#8	2.3	3.7	84.8	34.7	7.5	65.3
#16	2.0	2.4	65.5	26.8	7.9	73.2
#30	1.8	2.0	46.0	19.1	7.8	80.9
#50	1.7	1.8	19.2	8.5	10.5	91.5
#100	1.6	1.7	3.6	2.4	6.1	97.6
LBW	1.3	1.6	0.6	1.1	1.3	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 4% for the 3/4" sieve when

a 1.5" max. size (nom. Max. 1.0") aggregate is used.

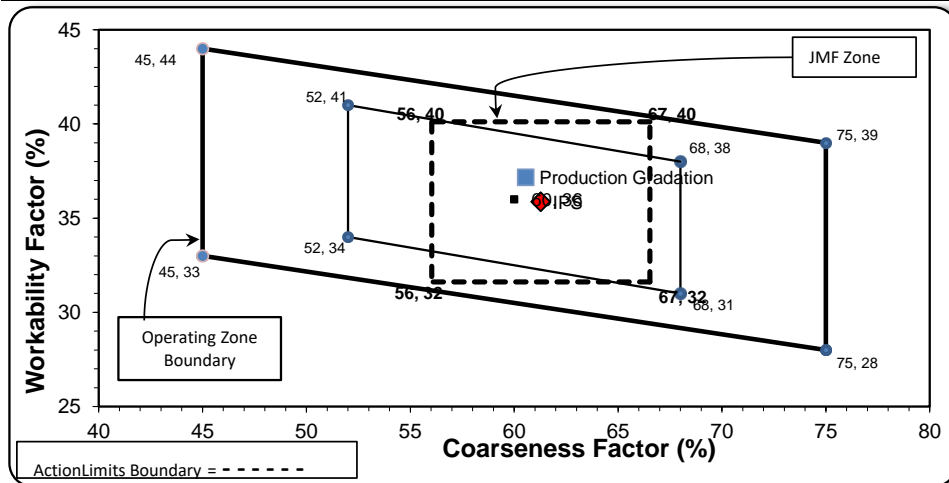
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	61	Workability Factor:	35	37.2
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Coarseness Factor:	61
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Workability Factor:	36
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.2	10.1	10.8
1/2"	70.7	18.5	29.3
3/8"	60.7	10.0	39.3
#4	44.4	16.3	55.6
#8	35.9	8.5	64.1
#16	27.3	8.6	72.7
#30	19.1	8.2	80.9
#50	7.4	11.7	92.6
#100	1.9	5.6	98.1
LBW	0.7	1.2	99.3

PREPARED BY:
 SM, LLC Technical Service

Approved BY:

Aggregate Optimization Chart

PLANT #: 12

Contractor: _____

Sample Date: 4/22/24

Concrete Grade: DM, 4500HP

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	53.4
26A	71-47	Presque Isle	205	1.25	2.62	7.1
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

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



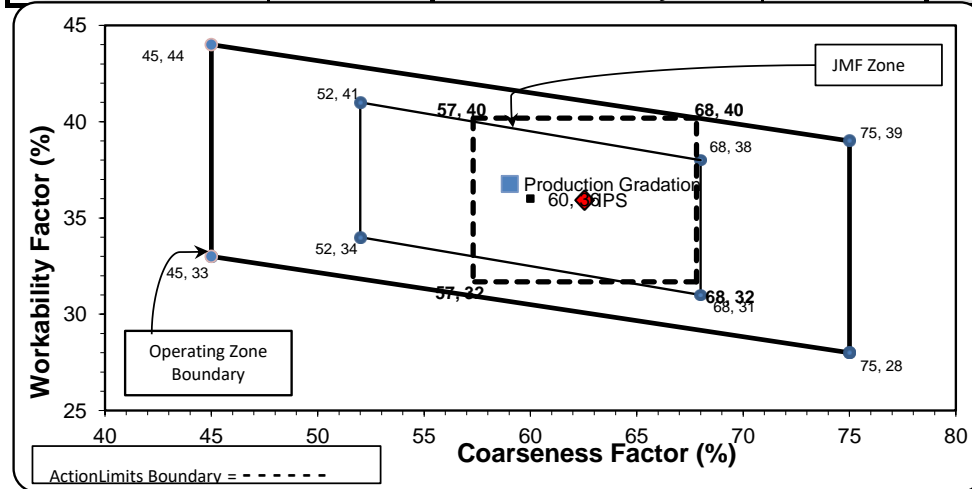
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 Suite 500
 Farmington Hills, MI 48336

Sieve	6AA	26A	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"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	86.4	100.0	100.0	92.7	6.9	7.3
1/2"	50.3	94.6	100.0	73.1	19.6	26.9
3/8"	29.3	84.7	100.0	61.2	11.9	38.8
#4	5.5	18.2	96.8	42.5	18.7	57.5
#8	2.9	3.6	82.0	34.3	8.3	65.7
#16	2.6	1.9	65.3	27.4	6.9	72.6
#30	2.5	1.6	48.6	20.7	6.7	79.3
#50	2.4	1.5	23.5	10.7	10.0	89.3
#100	2.3	1.5	3.3	2.6	8.0	97.4
LBW	2.0	1.3	0.5	1.4	1.3	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	59	Workability Factor:	34	Adjusted WF	36.8	Coarseness Factor:	63
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.0	10.3	11.0
1/2"	70.3	18.7	29.7
3/8"	59.9	10.4	40.1
#4	41.9	18.0	58.1
#8	35.9	6.0	64.1
#16	27.8	8.2	72.2
#30	18.9	8.8	81.1
#50	6.3	12.6	93.7
#100	1.7	4.6	98.3
LBW	1.0	0.7	99.0

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Aggregate Optimization Chart

PLANT #: p11

Contractor: _____

Sample Date: 4/22/24

Concrete Grade: DM, 4500HP

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1505	9.21	2.62	51.8
26A	71-47	Presque Isle	250	1.53	2.62	8.6
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

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



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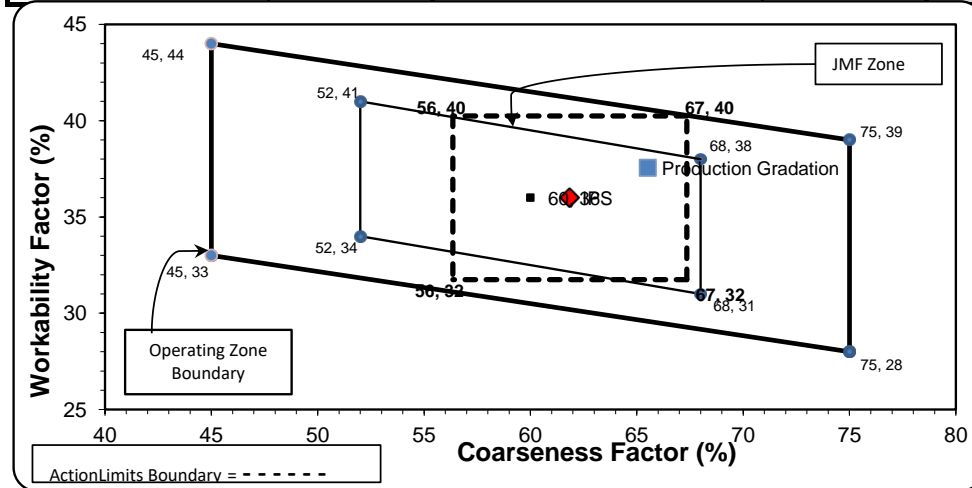
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	96.8	100.0	100.0	98.3	1.7	1.7
3/4"	78.7	100.0	100.0	89.0	9.4	11.0
1/2"	39.9	94.6	100.0	68.4	20.6	31.6
3/8"	20.4	84.7	100.0	57.4	11.0	42.6
#4	3.7	18.2	97.6	42.1	15.3	57.9
#8	2.1	3.6	85.0	35.0	7.1	65.0
#16	1.8	1.9	70.6	29.0	6.0	71.0
#30	1.8	1.6	49.4	20.6	8.4	79.4
#50	1.7	1.5	23.7	10.4	10.2	89.6
#100	1.6	1.5	7.3	3.8	6.5	96.2
LBW	1.3	1.3	1.4	1.3	2.5	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	66	Workability Factor:	35	37.5	Coarseness Factor:	62
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Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	100.0	0.0	0.0
3/4"	95.0	5.0	5.0
1/2"	72.3	22.8	27.7
3/8"	60.4	11.8	39.6
#4	42.6	17.8	57.4
#8	36.0	6.6	64.0
#16	29.5	6.5	70.5
#30	20.3	9.2	79.7
#50	9.5	10.8	90.5
#100	3.4	6.1	96.6
LBW	1.3	2.1	98.7

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-35**

Sample Date: 4/22/24

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1350	8.04	2.69	45.8
26A	58-003	Stoneco	450	2.68	2.69	15.3
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

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



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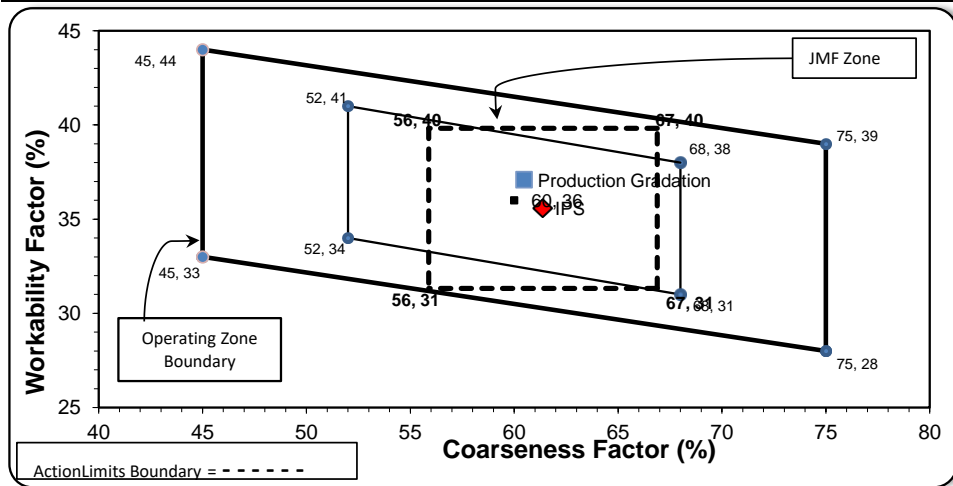
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	84.2	100.0	100.0	92.8	7.1	7.2
1/2"	41.1	97.9	100.0	72.7	20.0	27.3
3/8"	19.2	83.1	100.0	60.4	12.3	39.6
#4	3.7	12.2	98.4	41.9	18.5	58.1
#8	2.3	3.7	84.6	34.6	7.3	65.4
#16	2.0	2.4	65.8	26.9	7.7	73.1
#30	1.8	2.0	45.4	18.8	8.1	81.2
#50	1.7	1.8	20.9	9.2	9.6	90.8
#100	1.6	1.7	3.9	2.5	6.7	97.5
LBW	1.3	1.6	0.8	1.2	1.4	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	60	Workability Factor:	35	37.1
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Coarseness Factor:	61
Workability Factor:	36



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-38**

Sample Date: 4/22/24

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	58-003	Stoneco	1350	8.04	2.69	45.8
26A	58-003	Stoneco	450	2.68	2.69	15.3
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0
Total Wt			2950	17.68		100.0

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



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Sieve	6AA	26A	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"	99.8	100.0	100.0	99.9	0.1	0.1
3/4"	84.2	100.0	100.0	92.8	7.1	7.2
1/2"	41.1	97.9	100.0	72.7	20.0	27.3
3/8"	19.2	83.1	100.0	60.4	12.3	39.6
#4	3.7	12.2	98.4	41.9	18.5	58.1
#8	2.3	3.7	84.6	34.6	7.3	65.4
#16	2.0	2.4	65.8	26.9	7.7	73.1
#30	1.8	2.0	45.4	18.8	8.1	81.2
#50	1.7	1.8	20.9	9.2	9.6	90.8
#100	1.6	1.7	3.9	2.5	6.7	97.5
LBW	1.3	1.6	0.8	1.2	1.4	98.8

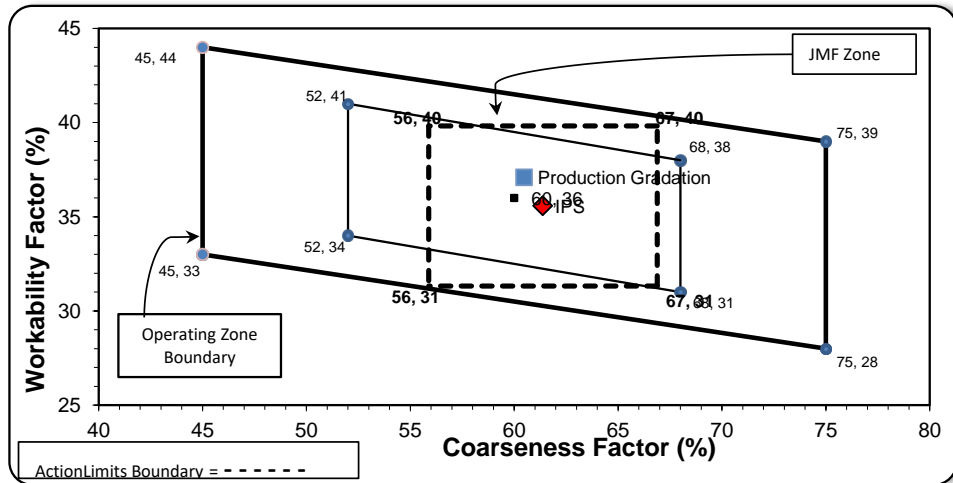
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor: 60	Workability Factor: 35	37.1
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Coarseness Factor: 61

Workability Factor: 36



Sieve	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	0.0	0.0
1.5"	100.0	0.0	0.0
1"	99.3	0.7	0.7
3/4"	89.1	10.2	10.9
1/2"	70.5	18.6	29.5
3/8"	60.5	10.0	39.5
#4	44.1	16.4	55.9
#8	35.6	8.5	64.4
#16	27.7	7.9	72.3
#30	20.6	7.1	79.4
#50	8.7	11.8	91.3
#100	1.6	7.1	98.4
LBW	1.1	0.6	98.9

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-02**

Sample Date: 4/22/24

Concrete Grade: DM, 4500HP

Contractor: _____

Dates Test Represents: 4/23/2024 through 4/29/2024

MDOT No.: _____

Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution
6AA	71-47	Presque Isle	1550	9.48	2.62	53.4
26A	71-47	Presque Isle	205	1.25	2.62	7.1
2NS	63-115	Ray Rd	1150	6.95	2.65	39.6
Total Wt			2905	17.69		100.0

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



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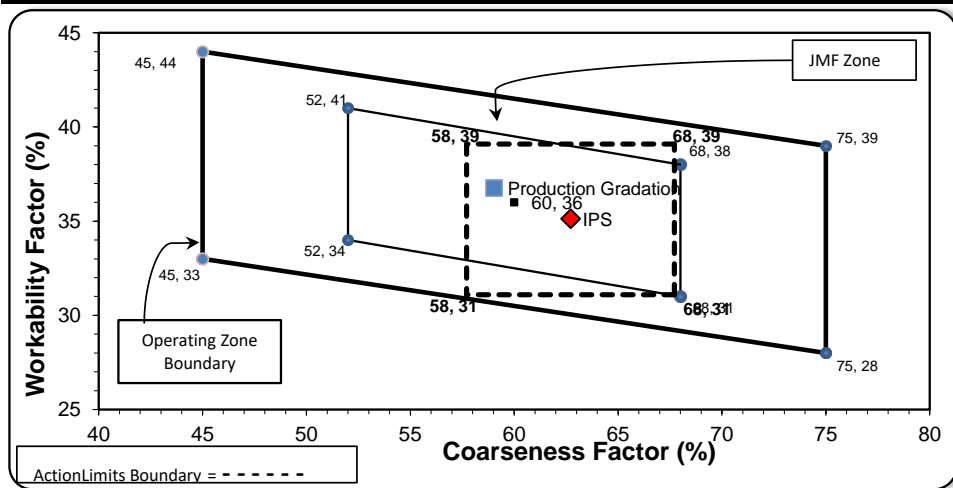
Sieve	6AA	26A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained
2"	100.0	100.0	100.0	100.0	0.0	0.0
1.5"	100.0	100.0	100.0	100.0	0.0	0.0
1"	99.4	100.0	100.0	99.7	0.3	0.3
3/4"	86.4	100.0	100.0	92.7	6.9	7.3
1/2"	50.3	94.6	100.0	73.1	19.6	26.9
3/8"	29.3	84.7	100.0	61.2	11.9	38.8
#4	5.5	18.2	96.8	42.5	18.7	57.5
#8	2.9	3.6	82.0	34.3	8.3	65.7
#16	2.6	1.9	65.3	27.4	6.9	72.6
#30	2.5	1.6	48.6	20.7	6.7	79.3
#50	2.4	1.5	23.5	10.7	10.0	89.3
#100	2.3	1.5	3.3	2.6	8.0	97.4
LBW	2.0	1.3	0.5	1.4	1.3	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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations Adjusted WF Initial Production Sample (IPS)

Coarseness Factor:	59	Workability Factor:	34	36.8
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Coarseness Factor:	63
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"	100.0	0.0	0.0
3/4"	95.1	4.9	4.9
1/2"	74.6	20.5	25.4
3/8"	59.3	15.3	40.7
#4	42.1	17.2	57.9
#8	35.1	7.1	64.9
#16	29.2	5.9	70.8
#30	21.9	7.3	78.1
#50	9.6	12.4	90.4
#100	2.4	7.2	97.6
LBW	0.9	1.5	99.1

PREPARED BY:
 SM, LLC Technical Service

Approved By: