# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-101**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 71-47 | Presque Isle | 1460 | 8.93 | 2.62 | 50.2 |
| 26A | 71-47 | Presque Isle | 300 | 1.83 | 2.62 | 10.3 |
| 2NS | 75-051 | Mid Michigan | 1150 | 6.93 | 2.66 | 39.5 |
| | | **Total Wt** | **2910** | **17.69** | | 100.0 |

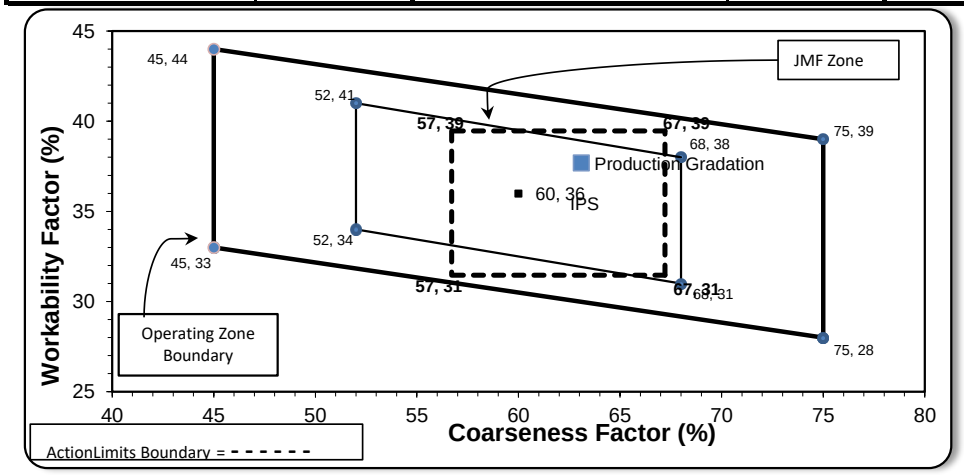
<----- Verify this number is 100%

| 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" | 98.0 | 100.0 | 100.0 | 99.0 | 1.0 | 1.0 |
| 3/4" | 87.4 | 100.0 | 100.0 | 93.7 | 5.3 | 6.3 |
| 1/2" | 41.8 | 98.7 | 100.0 | 70.7 | 23.0 | 29.3 |
| 3/8" | 21.0 | 87.9 | 100.0 | 59.1 | 11.5 | 40.9 |
| #4 | 2.9 | 22.1 | 99.0 | 42.9 | 16.3 | 57.1 |
| #8 | 1.9 | 5.2 | 85.3 | 35.2 | 7.7 | 64.8 |
| #16 | 1.6 | 2.9 | 70.1 | 28.8 | 6.4 | 71.2 |
| #30 | 1.5 | 2.4 | 53.2 | 22.0 | 6.8 | 78.0 |
| #50 | 1.4 | 2.1 | 26.3 | 11.3 | 10.7 | 88.7 |
| #100 | 1.3 | 1.9 | 6.8 | 3.5 | 7.8 | 96.5 |
| LBW | 1.2 | 1.7 | 1.0 | 1.2 | 2.4 | 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 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: | 63 | Workability Factor: | 35 | Adjusted WF 37.7 |
|---|---|---|---|---|




Initial Production Sample (IPS)

| Coarseness Factor: | 62 |
|---|---|
| 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" | 95.0 | 5.0 | 5.0 |
| 1/2" | 70.5 | 24.5 | 29.5 |
| 3/8" | 60.0 | 10.5 | 40.0 |
| #4 | 44.4 | 15.6 | 55.6 |
| #8 | 35.5 | 9.0 | 64.5 |
| #16 | 28.5 | 7.0 | 71.5 |
| #30 | 21.5 | 7.0 | 78.5 |
| #50 | 10.2 | 11.3 | 89.8 |
| #100 | 3.1 | 7.1 | 96.9 |
| LBW | 1.3 | 1.8 | 98.7 |


**Superior Materials, LLC**
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PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-102**

Contractor: _____

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 58-003 | Stoneco | 1400 | 8.34 | 2.69 | 47.5 |
| 26A | 58-003 | Stoneco | 400 | 2.38 | 2.69 | 13.6 |
| 2NS | 81-019 | Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |
| | | **Total Wt** | **2950** | **17.68** | | 100.0 |

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

| 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" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 3/4" | 81.1 | 100.0 | 100.0 | 91.0 | 9.0 | 9.0 |
| 1/2" | 43.7 | 99.6 | 100.0 | 73.2 | 17.8 | 26.8 |
| 3/8" | 20.1 | 86.4 | 100.0 | 60.2 | 13.0 | 39.8 |
| #4 | 3.8 | 23.1 | 99.3 | 43.6 | 16.6 | 56.4 |
| #8 | 1.8 | 6.7 | 84.5 | 34.7 | 8.9 | 65.3 |
| #16 | 1.2 | 3.5 | 68.5 | 27.7 | 7.0 | 72.3 |
| #30 | 1.0 | 2.6 | 50.6 | 20.6 | 7.2 | 79.4 |
| #50 | 0.9 | 2.3 | 26.2 | 11.0 | 9.6 | 89.0 |
| #100 | 0.8 | 2.2 | 7.6 | 3.6 | 7.3 | 96.4 |
| LBW | 1.0 | 2.0 | 1.4 | 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.


**Superior Materials, LLC**
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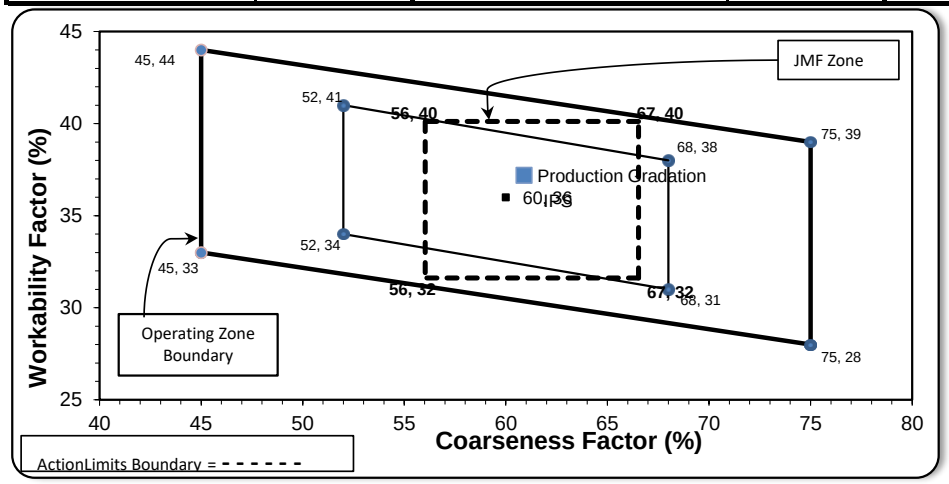
Production Gradation ○ Batch Plant Gradations ◉ Aggregate Supplier Gradations

| Coarseness Factor: | 61 | Workability Factor: | 35 | Adjusted WF 37.2 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| 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**

Contractor: _____

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 58-003 | Stoneco | 1400 | 8.34 | 2.69 | 47.5 |
| 26A | 58-003 | Stoneco | 400 | 2.38 | 2.69 | 13.6 |
| 2NS | 81-019 | Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |
| | | **Total Wt** | **2950** | **17.68** | | 100.0 |

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

| 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" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 3/4" | 81.1 | 100.0 | 100.0 | 91.0 | 9.0 | 9.0 |
| 1/2" | 43.7 | 99.6 | 100.0 | 73.2 | 17.8 | 26.8 |
| 3/8" | 20.1 | 86.4 | 100.0 | 60.2 | 13.0 | 39.8 |
| #4 | 3.8 | 23.1 | 99.3 | 43.6 | 16.6 | 56.4 |
| #8 | 1.8 | 6.7 | 84.5 | 34.7 | 8.9 | 65.3 |
| #16 | 1.2 | 3.5 | 68.5 | 27.7 | 7.0 | 72.3 |
| #30 | 1.0 | 2.6 | 50.6 | 20.6 | 7.2 | 79.4 |
| #50 | 0.9 | 2.3 | 26.2 | 11.0 | 9.6 | 89.0 |
| #100 | 0.8 | 2.2 | 7.6 | 3.6 | 7.3 | 96.4 |
| LBW | 1.0 | 2.0 | 1.4 | 1.3 | 2.3 | 98.7 |

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

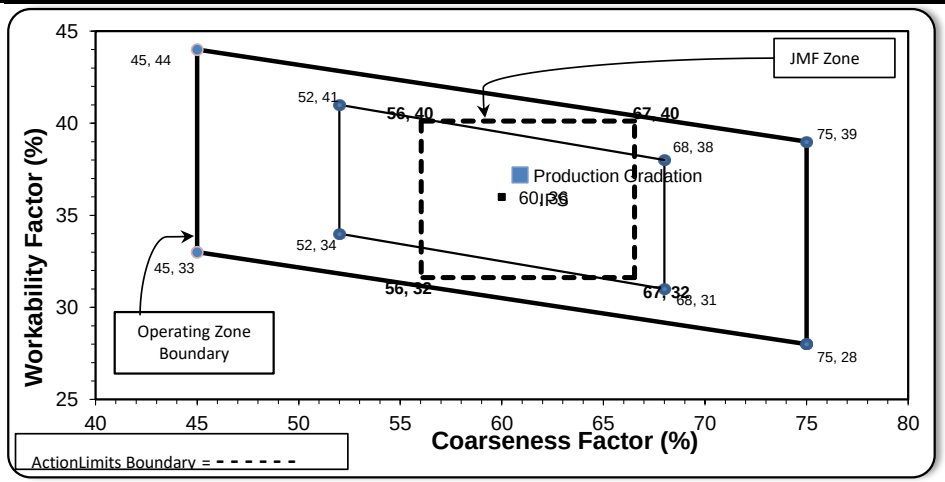
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.

*% 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

| Coarseness Factor: | 61 | Workability Factor: | 35 | Adjusted WF 37.2 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| 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 |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PREPARED BY:
SM, LLC Technical Service

Approved BY:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-14**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 58-003 | Stoneco | 1460 | 8.70 | 2.69 | 49.3 |
| 26A | 58-003 | Stoneco | 400 | 2.38 | 2.69 | 13.5 |
| 2NS | 19-55 | Schlegel | 1100 | 6.60 | 2.67 | 37.2 |
| | | **Total Wt** | **2960** | **17.68** | | 100.0 |

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

| 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" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 3/4" | 81.1 | 100.0 | 100.0 | 90.7 | 9.3 | 9.3 |
| 1/2" | 43.7 | 99.6 | 100.0 | 72.2 | 18.5 | 27.8 |
| 3/8" | 20.1 | 86.4 | 100.0 | 58.8 | 13.4 | 41.2 |
| #4 | 3.8 | 23.1 | 99.9 | 42.1 | 16.6 | 57.9 |
| #8 | 1.8 | 6.7 | 89.3 | 35.0 | 7.1 | 65.0 |
| #16 | 1.2 | 3.5 | 67.3 | 26.1 | 8.9 | 73.9 |
| #30 | 1.0 | 2.6 | 45.8 | 17.9 | 8.2 | 82.1 |
| #50 | 0.9 | 2.3 | 17.0 | 7.1 | 10.8 | 92.9 |
| #100 | 0.8 | 2.2 | 2.8 | 1.7 | 5.3 | 98.3 |
| LBW | 1.0 | 2.0 | 0.5 | 0.9 | 0.8 | 99.1 |

*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.


**Builders Redi-Mix**
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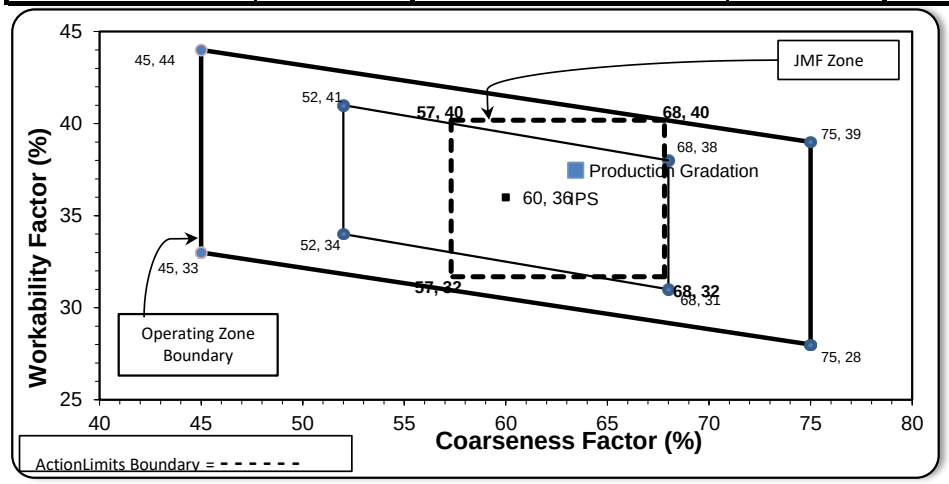
Farmington Hills, MI 48336


Production Gradation ○ Batch Plant Gradations ◉ Aggregate Supplier Gradations

| Coarseness Factor: | 63 | Workability Factor: | 35 | Adjusted WF 37.5 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| Coarseness Factor: | 63 |
|---|---|
| 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" | 89.0 | 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 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-12**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | 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 | 63-115 | Ray Rd | 1150 | 6.95 | 2.65 | 39.6 |
| | | **Total Wt** | **2905** | **17.69** | | 100.0 |

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

| 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" | 94.8 | 100.0 | 100.0 | 97.3 | 2.7 | 2.7 |
| 3/4" | 71.3 | 100.0 | 100.0 | 85.1 | 12.2 | 14.9 |
| 1/2" | 33.8 | 96.8 | 100.0 | 65.4 | 19.7 | 34.6 |
| 3/8" | 16.5 | 86.1 | 100.0 | 55.5 | 9.9 | 44.5 |
| #4 | 3.9 | 27.7 | 96.1 | 42.4 | 13.1 | 57.6 |
| #8 | 2.6 | 8.2 | 77.4 | 32.7 | 9.8 | 67.3 |
| #16 | 2.1 | 3.8 | 61.3 | 25.7 | 7.0 | 74.3 |
| #30 | 1.8 | 2.8 | 46.2 | 19.5 | 6.2 | 80.5 |
| #50 | 1.7 | 2.5 | 26.8 | 11.7 | 7.8 | 88.3 |
| #100 | 1.5 | 2.3 | 7.6 | 4.0 | 7.7 | 96.0 |
| LBW | 1.2 | 1.9 | 1.1 | 1.2 | 2.8 | 98.8 |


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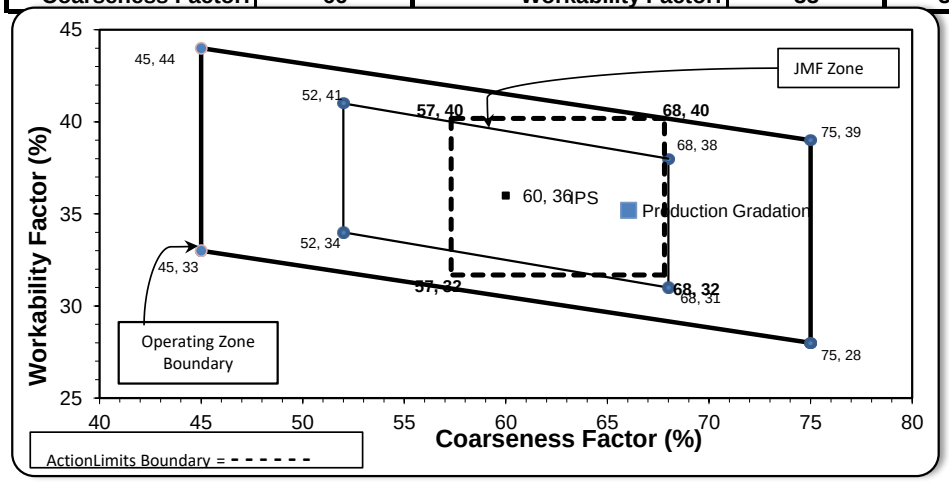
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom.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

Production Gradation ○ Batch Plant Gradations ◉ Aggregate Supplier Gradations

| Coarseness Factor: | 66 | Workability Factor: | 33 | Adjusted WF 35.2 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| Coarseness Factor: | 63 |
|---|---|
| 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" | 89.0 | 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 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-32**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 71-47 | Presque Isle | 1555 | 9.51 | 2.62 | 53.5 |
| 26A | 71-47 | Presque Isle | 200 | 1.22 | 2.62 | 6.9 |
| 2NS | 95-013 | Smelter Bay | 1150 | 6.95 | 2.65 | 39.6 |
| | | **Total Wt** | **2905** | **17.69** | | 100.0 |

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

| 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" | 97.6 | 100.0 | 100.0 | 98.7 | 1.3 | 1.3 |
| 3/4" | 85.4 | 100.0 | 100.0 | 92.2 | 6.5 | 7.8 |
| 1/2" | 49.9 | 96.8 | 100.0 | 73.0 | 19.2 | 27.0 |
| 3/8" | 28.7 | 86.1 | 100.0 | 60.9 | 12.1 | 39.1 |
| #4 | 6.1 | 27.7 | 95.5 | 43.0 | 17.9 | 57.0 |
| #8 | 2.4 | 8.2 | 82.3 | 34.4 | 8.5 | 65.6 |
| #16 | 1.9 | 3.8 | 67.1 | 27.8 | 6.6 | 72.2 |
| #30 | 1.8 | 2.8 | 48.8 | 20.5 | 7.4 | 79.5 |
| #50 | 1.8 | 2.5 | 24.7 | 10.9 | 9.6 | 89.1 |
| #100 | 1.7 | 2.3 | 8.0 | 4.2 | 6.7 | 95.8 |
| LBW | 1.5 | 1.9 | 1.4 | 1.5 | 2.7 | 98.5 |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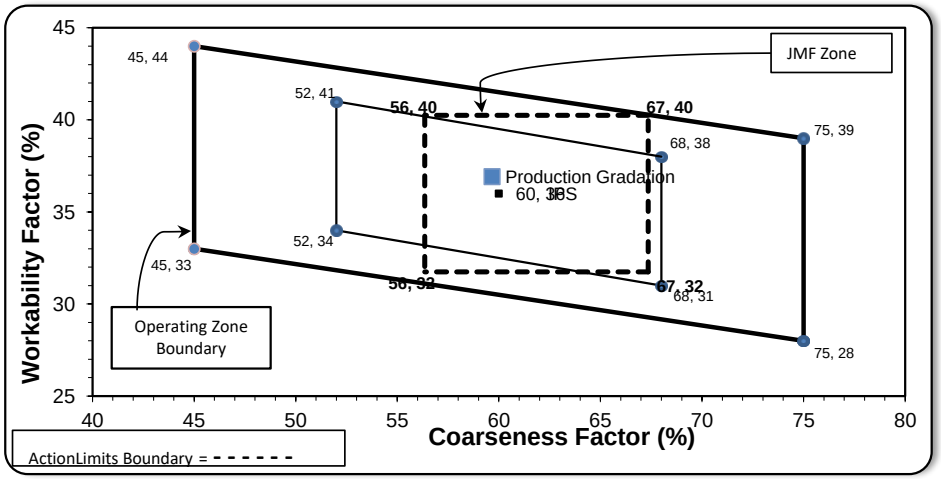
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation ○ Batch Plant Gradations ◉ Aggregate Supplier Gradations

| Coarseness Factor: | 60 | Workability Factor: | 34 | Adjusted WF 36.9 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| Coarseness Factor: | 62 |
|---|---|
| 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" | 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**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 58-003 | Stoneco | 1400 | 8.34 | 2.69 | 47.5 |
| 26A | 58-003 | Stoneco | 400 | 2.38 | 2.69 | 13.6 |
| 2NS | 81-019 | Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |
| | | **Total Wt** | **2950** | **17.68** | | 100.0 |

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

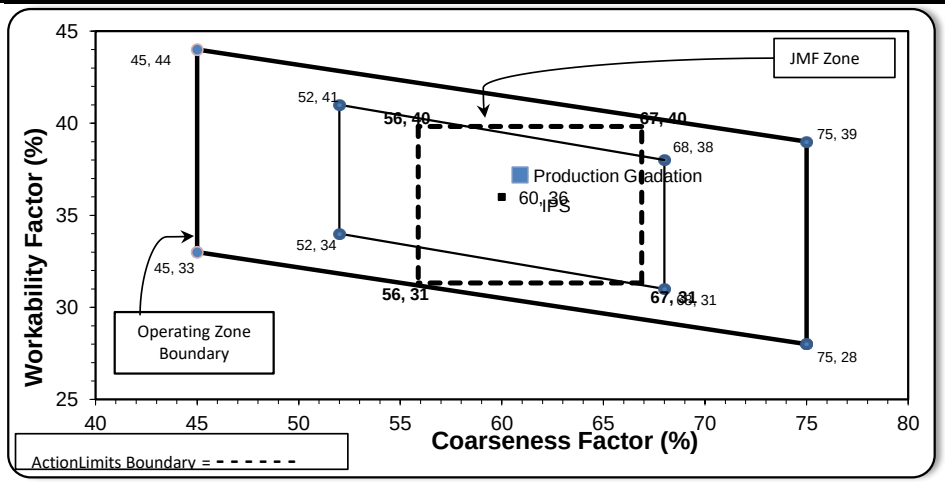
| Sieve | 6AA | 26A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 3/4" | 81.1 | 100.0 | 100.0 | 91.0 | 9.0 | 9.0 |
| 1/2" | 43.7 | 99.6 | 100.0 | 73.2 | 17.8 | 26.8 |
| 3/8" | 20.1 | 86.4 | 100.0 | 60.2 | 13.0 | 39.8 |
| #4 | 3.8 | 23.1 | 99.3 | 43.6 | 16.6 | 56.4 |
| #8 | 1.8 | 6.7 | 84.5 | 34.7 | 8.9 | 65.3 |
| #16 | 1.2 | 3.5 | 68.5 | 27.7 | 7.0 | 72.3 |
| #30 | 1.0 | 2.6 | 50.6 | 20.6 | 7.2 | 79.4 |
| #50 | 0.9 | 2.3 | 26.2 | 11.0 | 9.6 | 89.0 |
| #100 | 0.8 | 2.2 | 7.6 | 3.6 | 7.3 | 96.4 |
| LBW | 1.0 | 2.0 | 1.4 | 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.


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


Production Gradation ○ Batch Plant Gradations ◉ Aggregate Supplier Gradations

| Coarseness Factor: | 61 | Workability Factor: | 35 | Adjusted WF 37.2 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| 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-36**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 71-47 | Presque Isle | 1505 | 9.21 | 2.62 | 51.8 |
| 26A | 71-47 | Presque Isle | 300 | 1.83 | 2.62 | 10.3 |
| 2NS | 63-92 | Grange Hall | 1100 | 6.65 | 2.65 | 37.9 |
| | | **Total Wt** | **2905** | **17.69** | | 100.0 |

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

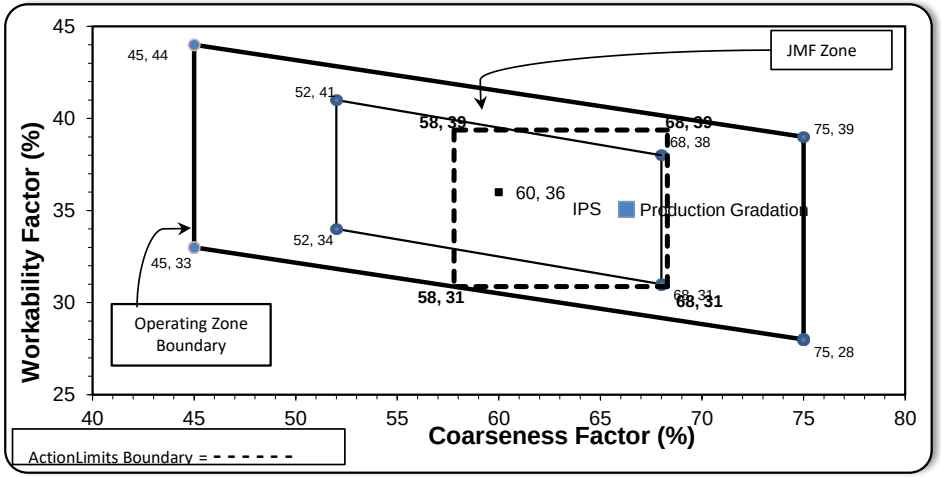
| Sieve | 6AA | 26A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 94.8 | 100.0 | 100.0 | 97.3 | 2.7 | 2.7 |
| 3/4" | 71.3 | 100.0 | 100.0 | 85.1 | 12.2 | 14.9 |
| 1/2" | 33.8 | 96.8 | 100.0 | 65.4 | 19.8 | 34.6 |
| 3/8" | 16.5 | 86.1 | 100.0 | 55.3 | 10.1 | 44.7 |
| #4 | 3.9 | 27.7 | 97.0 | 41.6 | 13.7 | 58.4 |
| #8 | 2.6 | 8.2 | 80.2 | 32.6 | 9.0 | 67.4 |
| #16 | 2.1 | 3.8 | 63.8 | 25.6 | 6.9 | 74.4 |
| #30 | 1.8 | 2.8 | 44.6 | 18.1 | 7.5 | 81.9 |
| #50 | 1.7 | 2.5 | 19.0 | 8.3 | 9.8 | 91.7 |
| #100 | 1.5 | 2.3 | 3.2 | 2.2 | 6.1 | 97.8 |
| LBW | 1.2 | 1.9 | 0.7 | 1.1 | 1.1 | 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.


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


Production Gradation ○ Batch Plant Gradations ◉ Aggregate Supplier Gradations

| Coarseness Factor: | 66 | Workability Factor: | 33 | Adjusted WF 35.1 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| 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" | 99.1 | 0.9 | 0.9 |
| 3/4" | 90.3 | 8.8 | 9.7 |
| 1/2" | 69.2 | 21.1 | 30.8 |
| 3/8" | 59.1 | 10.1 | 40.9 |
| #4 | 41.8 | 17.3 | 58.2 |
| #8 | 35.1 | 6.6 | 64.9 |
| #16 | 28.5 | 6.6 | 71.5 |
| #30 | 21.2 | 7.3 | 78.8 |
| #50 | 8.7 | 12.5 | 91.3 |
| #100 | 1.8 | 7.0 | 98.2 |
| LBW | 0.7 | 1.0 | 99.3 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-39**

Contractor:

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| 6AA | 71-47 | Presque Isle | 1605 | 9.82 | 2.62 | 55.2 |
| 26A | 71-47 | Presque Isle | 200 | 1.22 | 2.62 | 6.9 |
| 2NS | 44-051 | Krake Willis Rd | 1100 | 6.65 | 2.65 | 37.9 |
| | | **Total Wt** | **2905** | **17.69** | | 100.0 |

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

| 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" | 98.0 | 100.0 | 100.0 | 98.9 | 1.1 | 1.1 |
| 3/4" | 87.4 | 100.0 | 100.0 | 93.0 | 5.9 | 7.0 |
| 1/2" | 41.8 | 98.7 | 100.0 | 67.8 | 25.3 | 32.2 |
| 3/8" | 21.0 | 87.9 | 100.0 | 55.5 | 12.2 | 44.5 |
| #4 | 2.9 | 22.1 | 96.7 | 39.7 | 15.8 | 60.3 |
| #8 | 1.9 | 5.2 | 81.3 | 32.2 | 7.5 | 67.8 |
| #16 | 1.6 | 2.9 | 67.2 | 26.5 | 5.7 | 73.5 |
| #30 | 1.5 | 2.4 | 50.9 | 20.3 | 6.3 | 79.7 |
| #50 | 1.4 | 2.1 | 24.9 | 10.3 | 9.9 | 89.7 |
| #100 | 1.3 | 1.9 | 7.3 | 3.6 | 6.7 | 96.4 |
| LBW | 1.2 | 1.7 | 1.2 | 1.2 | 2.4 | 98.8 |


**Superior Materials, LLC**
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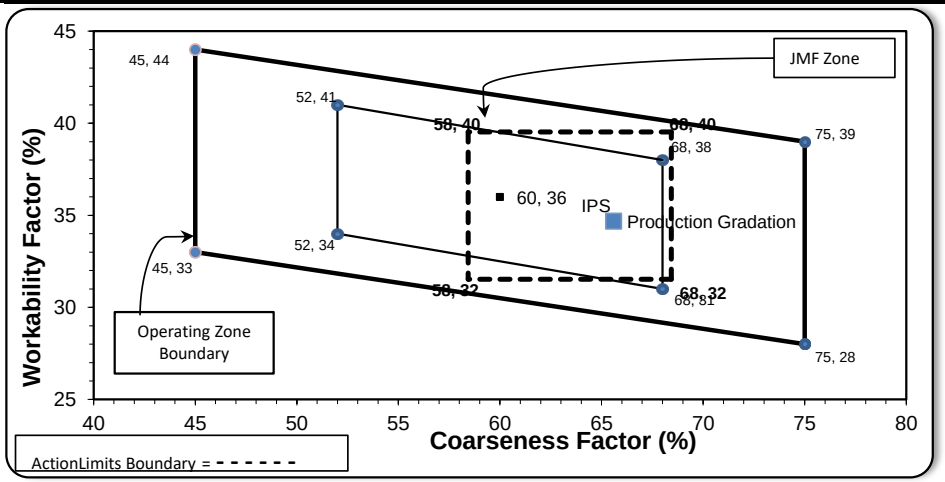
Suite 500
Farmington Hills, MI 48336


*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: | 66 | Workability Factor: | 32 | Adjusted WF 34.7 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| Coarseness Factor: | 63 |
|---|---|
| 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" | 100.0 | 0.0 | 0.0 |
| 3/4" | 89.7 | 10.3 | 10.3 |
| 1/2" | 70.3 | 19.4 | 29.7 |
| 3/8" | 59.1 | 11.2 | 40.9 |
| #4 | 42.8 | 16.3 | 57.2 |
| #8 | 35.5 | 7.3 | 64.5 |
| #16 | 29.0 | 6.5 | 71.0 |
| #30 | 21.2 | 7.7 | 78.8 |
| #50 | 9.8 | 11.5 | 90.2 |
| #100 | 3.7 | 6.1 | 96.3 |
| LBW | 1.2 | 2.5 | 98.8 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-O2**

Contractor: _____

Sample Date: 8/15/22

Concrete Grade: **DM, 4500HP**

Dates Test Represents: 8/16/2022 through 8/22/2022

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | 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 | 63-115 | Ray Rd | 1150 | 6.95 | 2.65 | 39.6 |
| | | **Total Wt** | **2905** | **17.69** | | 100.0 |

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

| 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" | 94.8 | 100.0 | 100.0 | 97.3 | 2.7 | 2.7 |
| 3/4" | 71.3 | 100.0 | 100.0 | 85.1 | 12.2 | 14.9 |
| 1/2" | 33.8 | 96.8 | 100.0 | 65.4 | 19.7 | 34.6 |
| 3/8" | 16.5 | 86.1 | 100.0 | 55.5 | 9.9 | 44.5 |
| #4 | 3.9 | 27.7 | 96.1 | 42.4 | 13.1 | 57.6 |
| #8 | 2.6 | 8.2 | 77.4 | 32.7 | 9.8 | 67.3 |
| #16 | 2.1 | 3.8 | 61.3 | 25.7 | 7.0 | 74.3 |
| #30 | 1.8 | 2.8 | 46.2 | 19.5 | 6.2 | 80.5 |
| #50 | 1.7 | 2.5 | 26.8 | 11.7 | 7.8 | 88.3 |
| #100 | 1.5 | 2.3 | 7.6 | 4.0 | 7.7 | 96.0 |
| LBW | 1.2 | 1.9 | 1.1 | 1.2 | 2.8 | 98.8 |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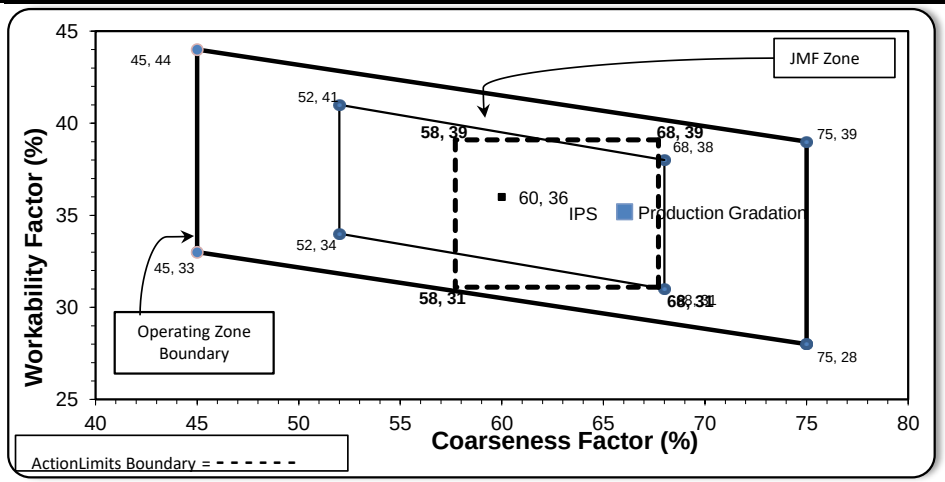
*Maximum % Retained must be above the 3/8" sieve.
*Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
*% Retained must be at least 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation ○ Batch Plant Gradations ◉ Aggregate SupplierGradations

| Coarseness Factor: | 66 | Workability Factor: | 33 | Adjusted WF 35.2 |
|---|---|---|---|---|




Intial Production Sample (IPS)

| 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: