# Aggregate Optimization Chart

Production Gradation Report

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

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 800 | 4.89 | 2.62 | 26.1 |
| 2NS | 75-051 | Mid Michigan | 1200 | 7.23 | 2.66 | 39.1 |
| | | **Total Wt** | **3070** | **18.67** | | 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" | 95.9 | 100.0 | 100.0 | 98.6 | 1.4 | 1.4 |
| 1" | 42.5 | 100.0 | 100.0 | 80.0 | 18.6 | 20.0 |
| 3/4" | 10.3 | 98.5 | 100.0 | 68.3 | 11.6 | 31.7 |
| 1/2" | 3.6 | 83.2 | 100.0 | 62.0 | 6.3 | 38.0 |
| 3/8" | 2.7 | 63.7 | 100.0 | 56.6 | 5.4 | 43.4 |
| #4 | 2.1 | 17.3 | 96.4 | 42.9 | 13.7 | 57.1 |
| #8 | 1.8 | 4.5 | 80.1 | 33.1 | 9.8 | 66.9 |
| #16 | 1.7 | 2.7 | 64.8 | 26.6 | 6.5 | 73.4 |
| #30 | 1.7 | 2.3 | 50.1 | 20.8 | 5.9 | 79.2 |
| #50 | 1.6 | 2.1 | 26.9 | 11.6 | 9.2 | 88.4 |
| #100 | 1.5 | 1.9 | 7.1 | 3.8 | 7.8 | 96.2 |
| LBW | 1.3 | 1.7 | 1.4 | 1.4 | 2.3 | 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.

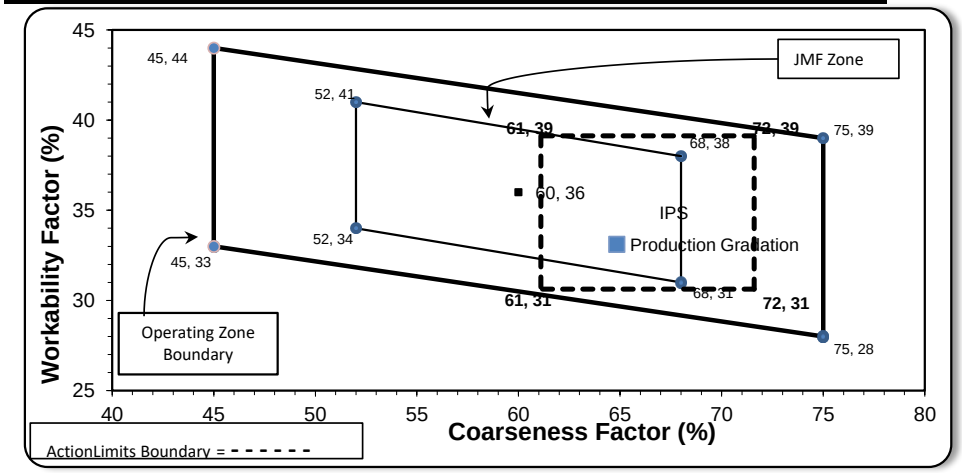
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.

*% Retained must be at least 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: | 65 | Workability Factor: | 33 |
|---|---|---|---|




Initial Production Sample (IPS)

| Coarseness Factor: | 66 |
|---|---|
| Workability Factor: | 35 |

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.6 | 0.4 | 0.4 |
| 1" | 84.3 | 15.3 | 15.7 |
| 3/4" | 74.8 | 9.6 | 25.2 |
| 1/2" | 64.3 | 10.4 | 35.7 |
| 3/8" | 56.8 | 7.5 | 43.2 |
| #4 | 43.0 | 13.8 | 57.0 |
| #8 | 34.9 | 8.1 | 65.1 |
| #16 | 26.4 | 8.5 | 73.6 |
| #30 | 19.9 | 6.5 | 80.1 |
| #50 | 10.4 | 9.5 | 89.6 |
| #100 | 3.4 | 7.0 | 96.6 |
| LBW | 1.2 | 2.2 | 98.8 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

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

Contractor:

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

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 | 81-019 | Pleasant Lake | 1200 | 7.26 | 2.65 | 38.5 |
| | | **Total Wt** | **3120** | **18.70** | | 100.0 |

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

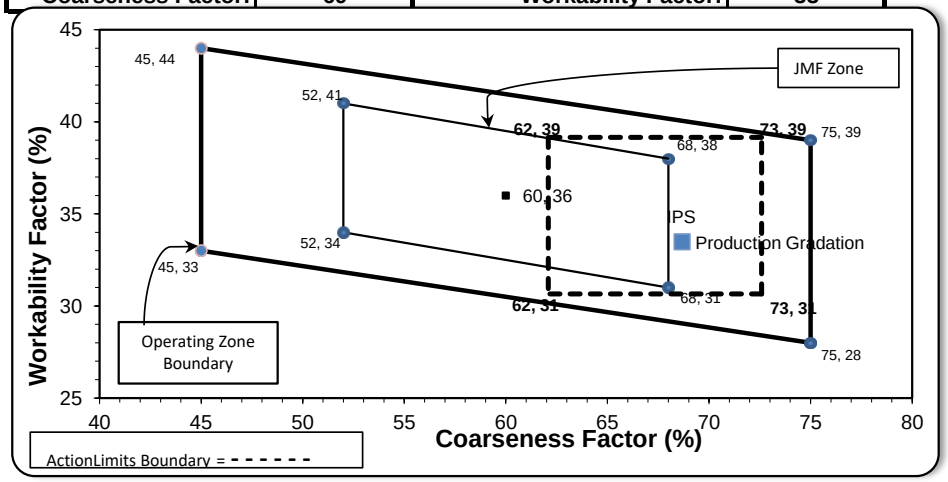
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 60.3 | 100.0 | 100.0 | 82.6 | 17.4 | 17.4 |
| 3/4" | 38.0 | 100.0 | 100.0 | 72.8 | 9.8 | 27.2 |
| 1/2" | 15.1 | 90.1 | 100.0 | 61.0 | 11.8 | 39.0 |
| 3/8" | 7.3 | 71.8 | 100.0 | 54.3 | 6.7 | 45.7 |
| #4 | 1.7 | 15.0 | 98.7 | 41.4 | 13.0 | 58.6 |
| #8 | 1.2 | 3.5 | 84.1 | 33.5 | 7.9 | 66.5 |
| #16 | 1.1 | 1.9 | 66.6 | 26.4 | 7.1 | 73.6 |
| #30 | 1.0 | 1.5 | 47.3 | 18.9 | 7.5 | 81.1 |
| #50 | 1.0 | 1.4 | 23.4 | 9.7 | 9.2 | 90.3 |
| #100 | 0.9 | 1.2 | 6.3 | 3.0 | 6.7 | 97.0 |
| LBW | 0.9 | 1.1 | 1.2 | 1.1 | 2.0 | 98.9 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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: | 69 | Workability Factor: | 33 |
|---|---|---|---|




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" | 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:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-103**

Contractor:

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

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 | 81-019 | Pleasant Lake | 1200 | 7.26 | 2.65 | 38.5 |
| | | **Total Wt** | **3120** | **18.70** | | 100.0 |

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

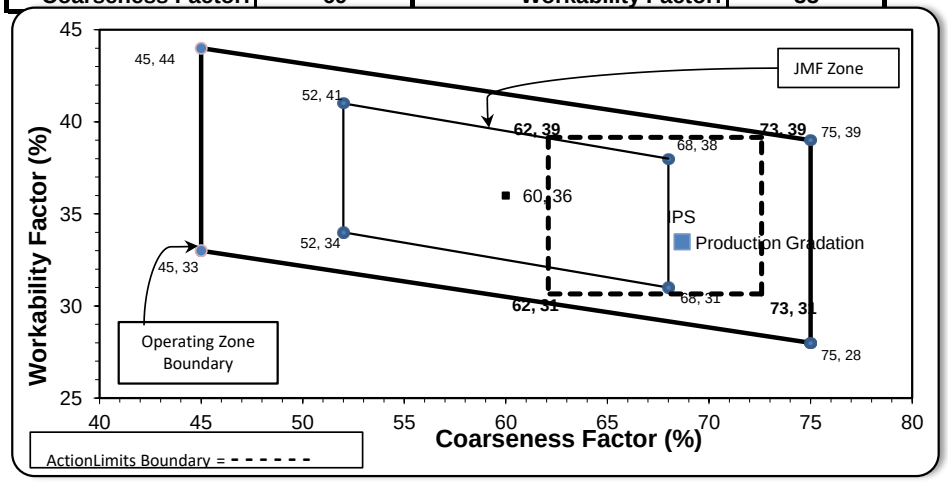
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 60.3 | 100.0 | 100.0 | 82.6 | 17.4 | 17.4 |
| 3/4" | 38.0 | 100.0 | 100.0 | 72.8 | 9.8 | 27.2 |
| 1/2" | 15.1 | 90.1 | 100.0 | 61.0 | 11.8 | 39.0 |
| 3/8" | 7.3 | 71.8 | 100.0 | 54.3 | 6.7 | 45.7 |
| #4 | 1.7 | 15.0 | 98.7 | 41.4 | 13.0 | 58.6 |
| #8 | 1.2 | 3.5 | 84.1 | 33.5 | 7.9 | 66.5 |
| #16 | 1.1 | 1.9 | 66.6 | 26.4 | 7.1 | 73.6 |
| #30 | 1.0 | 1.5 | 47.3 | 18.9 | 7.5 | 81.1 |
| #50 | 1.0 | 1.4 | 23.4 | 9.7 | 9.2 | 90.3 |
| #100 | 0.9 | 1.2 | 6.3 | 3.0 | 6.7 | 97.0 |
| LBW | 0.9 | 1.1 | 1.2 | 1.1 | 2.0 | 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: | 69 | Workability Factor: | 33 |
|---|---|---|---|




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" | 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:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** 14

Contractor:

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

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 | 19-04 | Schlegel | 1200 | 7.20 | 2.67 | 38.5 |
| | | **Total Wt** | **3120** | **18.64** | | 100.0 |

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

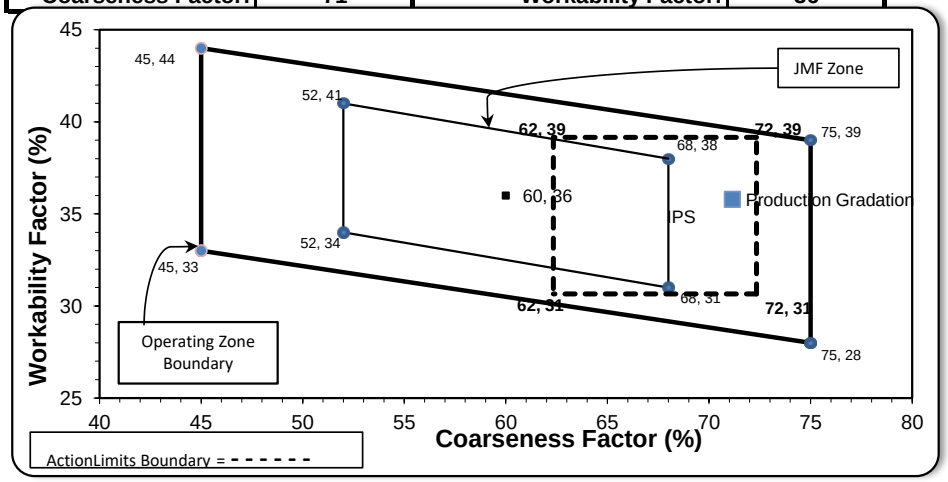
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 60.3 | 100.0 | 100.0 | 82.6 | 17.4 | 17.4 |
| 3/4" | 38.0 | 100.0 | 100.0 | 72.8 | 9.8 | 27.2 |
| 1/2" | 15.1 | 90.1 | 100.0 | 61.0 | 11.8 | 39.0 |
| 3/8" | 7.3 | 71.8 | 100.0 | 54.3 | 6.7 | 45.7 |
| #4 | 1.7 | 15.0 | 99.9 | 41.8 | 12.5 | 58.2 |
| #8 | 1.2 | 3.5 | 90.1 | 35.8 | 6.0 | 64.2 |
| #16 | 1.1 | 1.9 | 69.4 | 27.5 | 8.3 | 72.5 |
| #30 | 1.0 | 1.5 | 44.5 | 17.8 | 9.7 | 82.2 |
| #50 | 1.0 | 1.4 | 14.3 | 6.2 | 11.6 | 93.8 |
| #100 | 0.9 | 1.2 | 2.7 | 1.6 | 4.5 | 98.4 |
| LBW | 0.9 | 1.1 | 0.2 | 0.7 | 1.0 | 99.3 |


**Builders Redi-Mix**
30701 W. 10 Mile Rd.
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: | 71 | 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" | 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:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** 12

Contractor:

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 750 | 4.59 | 2.62 | 24.4 |
| 2NS | 63-115 | Ray Rd | 1250 | 7.56 | 2.65 | 40.7 |
| | | **Total Wt** | **3070** | **18.69** | | 100.0 |

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

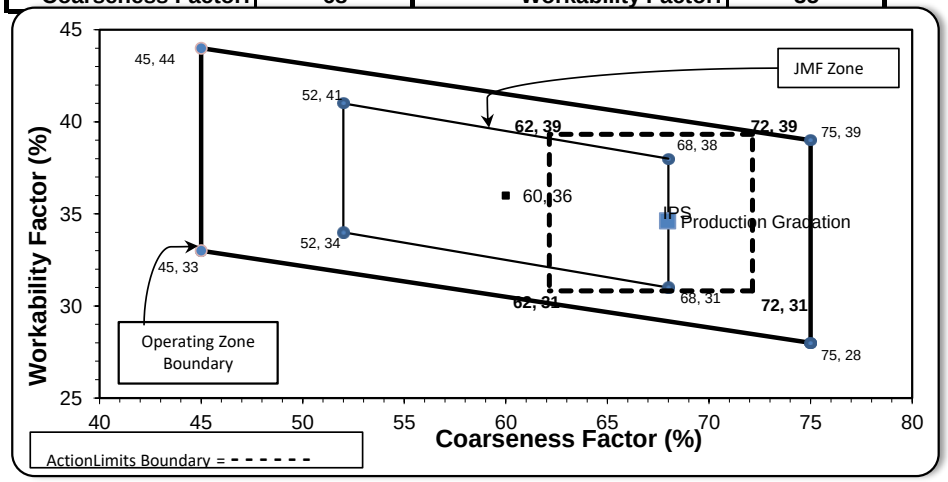
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 42.4 | 100.0 | 100.0 | 79.9 | 20.1 | 20.1 |
| 3/4" | 15.3 | 97.9 | 100.0 | 70.0 | 10.0 | 30.0 |
| 1/2" | 5.1 | 76.0 | 100.0 | 61.1 | 8.9 | 38.9 |
| 3/8" | 3.8 | 55.4 | 100.0 | 55.6 | 5.5 | 44.4 |
| #4 | 2.6 | 10.9 | 96.6 | 42.9 | 12.7 | 57.1 |
| #8 | 2.3 | 3.3 | 81.1 | 34.6 | 8.3 | 65.4 |
| #16 | 2.2 | 2.5 | 66.4 | 28.4 | 6.2 | 71.6 |
| #30 | 2.1 | 2.3 | 50.4 | 21.8 | 6.6 | 78.2 |
| #50 | 2.0 | 2.2 | 25.6 | 11.7 | 10.2 | 88.3 |
| #100 | 1.8 | 2.1 | 5.4 | 3.3 | 8.3 | 96.7 |
| LBW | 1.5 | 1.6 | 0.6 | 1.2 | 2.2 | 98.8 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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: | 68 | 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" | 99.6 | 0.4 | 0.4 |
| 1" | 83.9 | 15.7 | 16.1 |
| 3/4" | 74.0 | 9.8 | 26.0 |
| 1/2" | 63.7 | 10.3 | 36.3 |
| 3/8" | 56.4 | 7.3 | 43.6 |
| #4 | 43.0 | 13.4 | 57.0 |
| #8 | 35.1 | 7.9 | 64.9 |
| #16 | 29.0 | 6.1 | 71.0 |
| #30 | 20.9 | 8.0 | 79.1 |
| #50 | 8.1 | 12.8 | 91.9 |
| #100 | 1.6 | 6.5 | 98.4 |
| LBW | 0.9 | 0.8 | 99.1 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **20**

Contractor:

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 970 | 5.93 | 2.62 | 31.6 |
| IA | 71-47 | Presque Isle | 900 | 5.50 | 2.62 | 29.3 |
| 2NS | 63-92 | Grange Hall | 1200 | 7.26 | 2.65 | 39.1 |
| | | **Total Wt** | **3070** | **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" | 97.9 | 100.0 | 100.0 | 99.3 | 0.7 | 0.7 |
| 1" | 36.3 | 100.0 | 100.0 | 79.9 | 19.5 | 20.1 |
| 3/4" | 12.8 | 98.3 | 100.0 | 71.9 | 7.9 | 28.1 |
| 1/2" | 3.9 | 80.1 | 100.0 | 63.8 | 8.1 | 36.2 |
| 3/8" | 2.7 | 56.8 | 100.0 | 56.6 | 7.2 | 43.4 |
| #4 | 1.8 | 12.4 | 97.7 | 42.4 | 14.2 | 57.6 |
| #8 | 1.6 | 4.4 | 85.0 | 35.0 | 7.4 | 65.0 |
| #16 | 1.6 | 3.0 | 71.7 | 29.4 | 5.6 | 70.6 |
| #30 | 1.5 | 2.6 | 53.4 | 22.1 | 7.3 | 77.9 |
| #50 | 1.5 | 2.5 | 23.4 | 10.4 | 11.8 | 89.6 |
| #100 | 1.4 | 2.3 | 5.3 | 3.2 | 7.2 | 96.8 |
| LBW | 1.1 | 2.0 | 2.1 | 1.8 | 1.4 | 98.2 |


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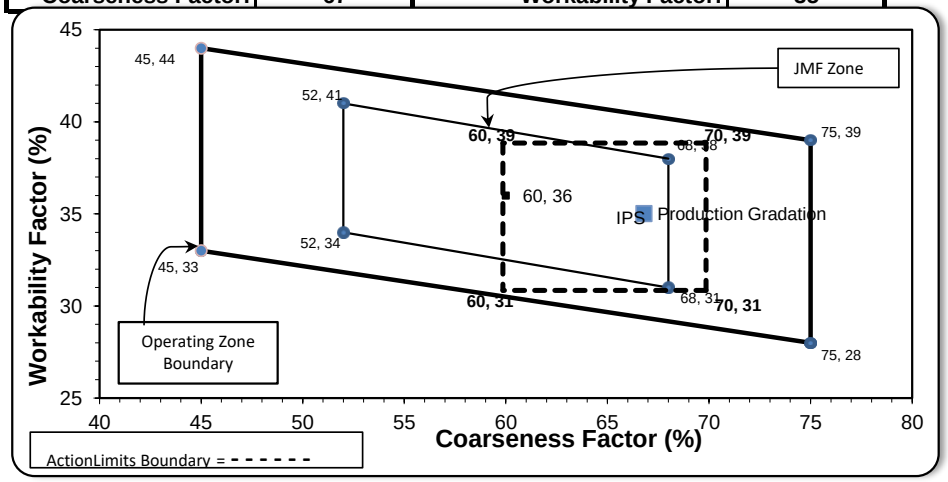
Suite 500
Farmington Hills, MI 48336


*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: | 67 | Workability Factor: | 35 |
|---|---|---|---|




Intial Production Sample (IPS)

| Coarseness Factor: | 65 |
|---|---|
| Workability Factor: | 35 |

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.1 | 0.9 | 0.9 |
| 1" | 80.8 | 18.2 | 19.2 |
| 3/4" | 71.3 | 9.6 | 28.7 |
| 1/2" | 64.0 | 7.3 | 36.0 |
| 3/8" | 57.7 | 6.2 | 42.3 |
| #4 | 42.8 | 15.0 | 57.2 |
| #8 | 34.8 | 7.9 | 65.2 |
| #16 | 28.4 | 6.4 | 71.6 |
| #30 | 20.2 | 8.2 | 79.8 |
| #50 | 7.6 | 12.6 | 92.4 |
| #100 | 1.6 | 6.0 | 98.4 |
| LBW | 1.0 | 0.6 | 99.0 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P11**

Contractor:

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.:

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 750 | 4.59 | 2.62 | 24.4 |
| 2NS | 95-013 | Smelter Bay | 1250 | 7.56 | 2.65 | 40.7 |
| | | **Total Wt** | **3070** | **18.69** | | 100.0 |

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

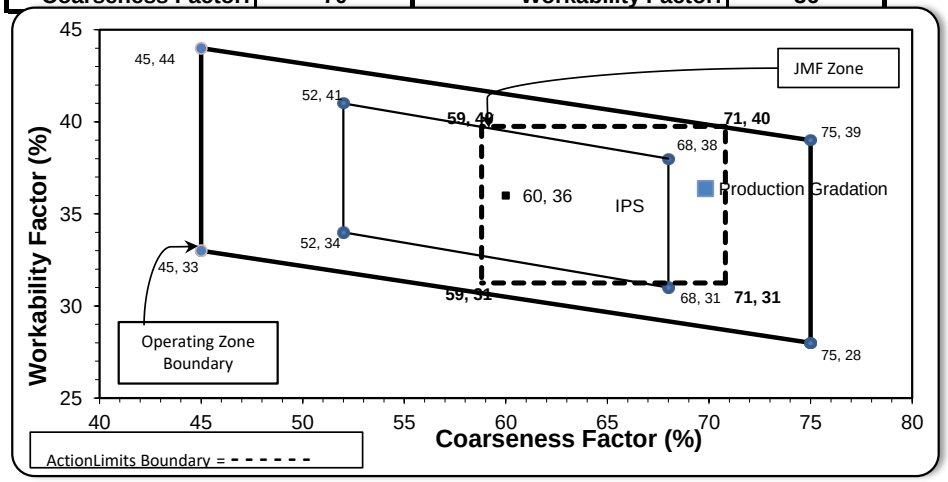
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 42.4 | 100.0 | 100.0 | 79.9 | 20.1 | 20.1 |
| 3/4" | 15.3 | 97.9 | 100.0 | 70.0 | 10.0 | 30.0 |
| 1/2" | 5.1 | 76.0 | 100.0 | 61.1 | 8.9 | 38.9 |
| 3/8" | 3.8 | 55.4 | 100.0 | 55.6 | 5.5 | 44.4 |
| #4 | 2.6 | 10.9 | 96.5 | 42.9 | 12.7 | 57.1 |
| #8 | 2.3 | 3.3 | 85.4 | 36.4 | 6.5 | 63.6 |
| #16 | 2.2 | 2.5 | 70.8 | 30.2 | 6.2 | 69.8 |
| #30 | 2.1 | 2.3 | 50.6 | 21.9 | 8.3 | 78.1 |
| #50 | 2.0 | 2.2 | 25.2 | 11.5 | 10.4 | 88.5 |
| #100 | 1.8 | 2.1 | 7.6 | 4.2 | 7.3 | 95.8 |
| LBW | 1.5 | 1.6 | 1.2 | 1.4 | 2.8 | 98.6 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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: | 70 | Workability Factor: | 36 |
|---|---|---|---|




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:

# Aggregate Optimization Chart

Production Gradation Report

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

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 750 | 4.59 | 2.62 | 24.4 |
| 2NS | 95-013 | Smelter Bay | 1250 | 7.56 | 2.65 | 40.7 |
| | | **Total Wt** | **3070** | **18.69** | | 100.0 |

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

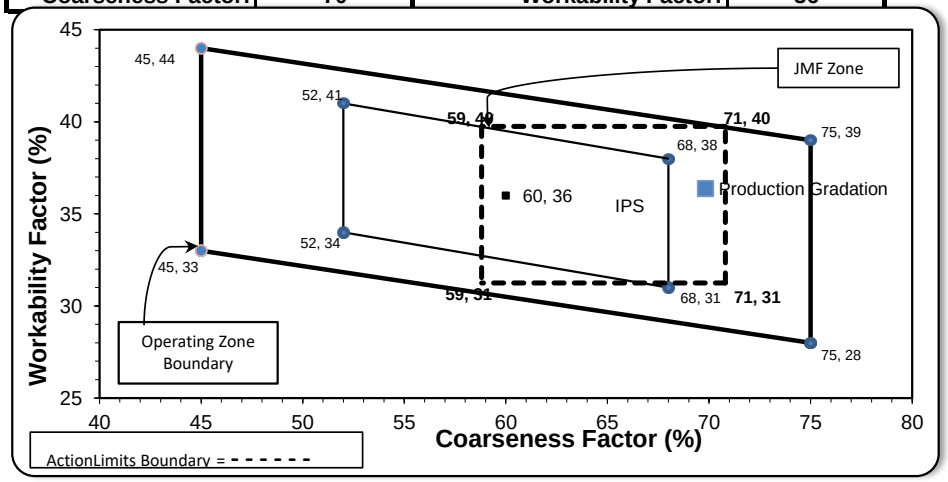
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 42.4 | 100.0 | 100.0 | 79.9 | 20.1 | 20.1 |
| 3/4" | 15.3 | 97.9 | 100.0 | 70.0 | 10.0 | 30.0 |
| 1/2" | 5.1 | 76.0 | 100.0 | 61.1 | 8.9 | 38.9 |
| 3/8" | 3.8 | 55.4 | 100.0 | 55.6 | 5.5 | 44.4 |
| #4 | 2.6 | 10.9 | 96.5 | 42.9 | 12.7 | 57.1 |
| #8 | 2.3 | 3.3 | 85.4 | 36.4 | 6.5 | 63.6 |
| #16 | 2.2 | 2.5 | 70.8 | 30.2 | 6.2 | 69.8 |
| #30 | 2.1 | 2.3 | 50.6 | 21.9 | 8.3 | 78.1 |
| #50 | 2.0 | 2.2 | 25.2 | 11.5 | 10.4 | 88.5 |
| #100 | 1.8 | 2.1 | 7.6 | 4.2 | 7.3 | 95.8 |
| LBW | 1.5 | 1.6 | 1.2 | 1.4 | 2.8 | 98.6 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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: | 70 | Workability Factor: | 36 |
|---|---|---|---|




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:

# Aggregate Optimization Chart

Production Gradation Report

**PLANT #:** **P-35**

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

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 | 81-019 | Pleasant Lake | 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" | 60.3 | 100.0 | 100.0 | 82.6 | 17.4 | 17.4 |
| 3/4" | 38.0 | 100.0 | 100.0 | 72.8 | 9.8 | 27.2 |
| 1/2" | 15.1 | 90.1 | 100.0 | 61.0 | 11.8 | 39.0 |
| 3/8" | 7.3 | 71.8 | 100.0 | 54.3 | 6.7 | 45.7 |
| #4 | 1.7 | 15.0 | 98.7 | 41.4 | 13.0 | 58.6 |
| #8 | 1.2 | 3.5 | 84.1 | 33.5 | 7.9 | 66.5 |
| #16 | 1.1 | 1.9 | 66.6 | 26.4 | 7.1 | 73.6 |
| #30 | 1.0 | 1.5 | 47.3 | 18.9 | 7.5 | 81.1 |
| #50 | 1.0 | 1.4 | 23.4 | 9.7 | 9.2 | 90.3 |
| #100 | 0.9 | 1.2 | 6.3 | 3.0 | 6.7 | 97.0 |
| LBW | 0.9 | 1.1 | 1.2 | 1.1 | 2.0 | 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.

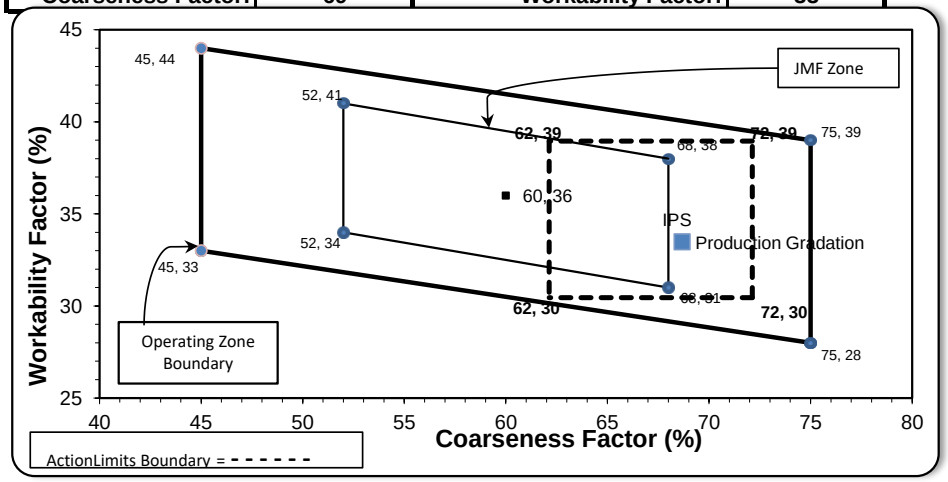
*% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.

*% 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: | 69 | Workability Factor: | 33 |
|---|---|---|---|




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-36**

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 800 | 4.89 | 2.62 | 26.1 |
| 2NS | 63-92 | Grange Hall | 1200 | 7.26 | 2.65 | 39.1 |
| | | **Total Wt** | **3070** | **18.70** | | 100.0 |

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

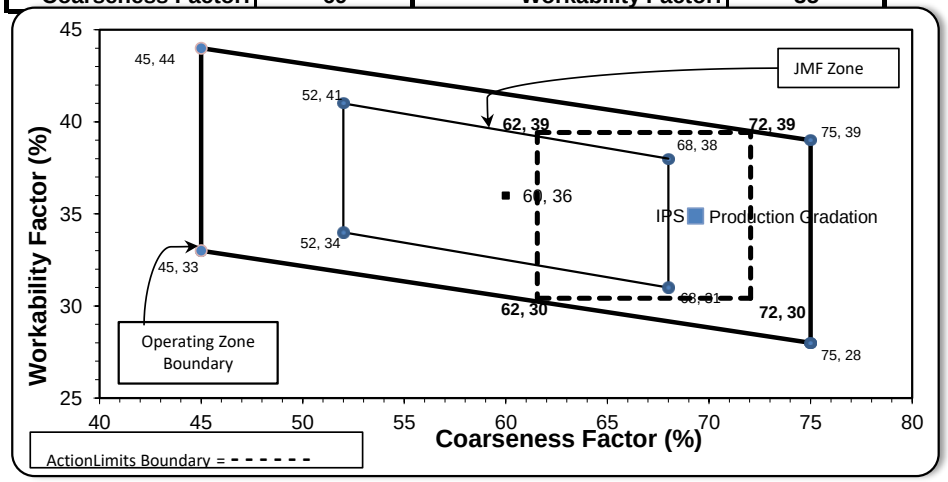
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 42.4 | 100.0 | 100.0 | 79.9 | 20.1 | 20.1 |
| 3/4" | 15.3 | 97.9 | 100.0 | 69.9 | 10.0 | 30.1 |
| 1/2" | 5.1 | 76.0 | 100.0 | 60.7 | 9.3 | 39.3 |
| 3/8" | 3.8 | 55.4 | 100.0 | 54.8 | 5.8 | 45.2 |
| #4 | 2.6 | 10.9 | 97.7 | 41.9 | 12.9 | 58.1 |
| #8 | 2.3 | 3.3 | 85.0 | 34.9 | 7.0 | 65.1 |
| #16 | 2.2 | 2.5 | 71.7 | 29.4 | 5.4 | 70.6 |
| #30 | 2.1 | 2.3 | 53.4 | 22.2 | 7.2 | 77.8 |
| #50 | 2.0 | 2.2 | 23.4 | 10.4 | 11.8 | 89.6 |
| #100 | 1.8 | 2.1 | 5.3 | 3.2 | 7.2 | 96.8 |
| LBW | 1.5 | 1.6 | 2.1 | 1.8 | 1.5 | 98.2 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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: | 69 | 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" | 85.0 | 15.0 | 15.0 |
| 3/4" | 72.1 | 12.9 | 27.9 |
| 1/2" | 64.5 | 7.6 | 35.5 |
| 3/8" | 56.5 | 8.0 | 43.5 |
| #4 | 42.7 | 13.8 | 57.3 |
| #8 | 34.9 | 7.8 | 65.1 |
| #16 | 29.0 | 5.9 | 71.0 |
| #30 | 21.0 | 8.0 | 79.0 |
| #50 | 8.2 | 12.8 | 91.8 |
| #100 | 1.6 | 6.5 | 98.4 |
| LBW | 0.7 | 0.9 | 99.3 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

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

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1020 | 6.24 | 2.62 | 33.2 |
| IA | 71-47 | Presque Isle | 800 | 4.89 | 2.62 | 26.1 |
| 2NS | 44-051 | Krake Willis Rd | 1250 | 7.56 | 2.65 | 40.7 |
| | | **Total Wt** | **3070** | **18.69** | | 100.0 |

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

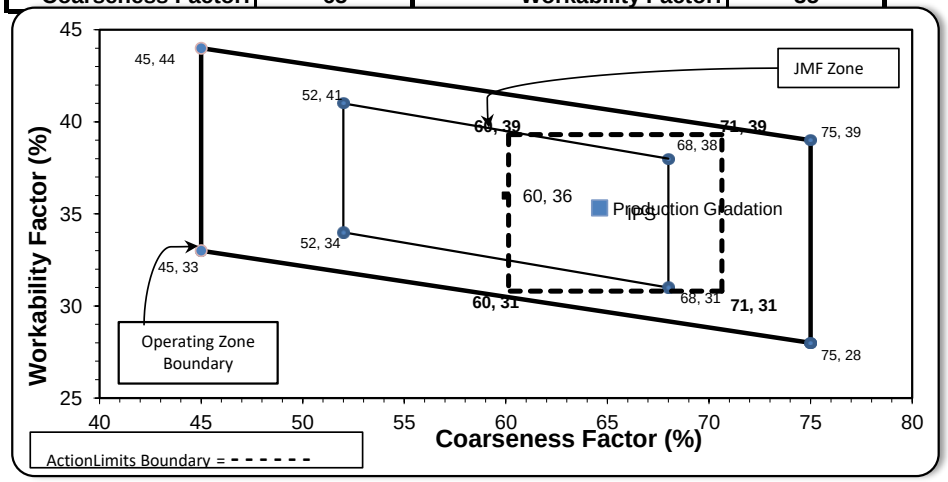
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 95.9 | 100.0 | 100.0 | 98.6 | 1.4 | 1.4 |
| 1" | 42.5 | 100.0 | 100.0 | 80.9 | 17.7 | 19.1 |
| 3/4" | 10.3 | 98.5 | 100.0 | 69.8 | 11.1 | 30.2 |
| 1/2" | 3.6 | 83.2 | 100.0 | 63.6 | 6.2 | 36.4 |
| 3/8" | 2.7 | 63.7 | 100.0 | 58.2 | 5.4 | 41.8 |
| #4 | 2.1 | 17.3 | 95.9 | 44.3 | 14.0 | 55.7 |
| #8 | 1.8 | 4.5 | 82.4 | 35.3 | 8.9 | 64.7 |
| #16 | 1.7 | 2.7 | 68.2 | 29.0 | 6.3 | 71.0 |
| #30 | 1.7 | 2.3 | 51.0 | 21.9 | 7.1 | 78.1 |
| #50 | 1.6 | 2.1 | 23.0 | 10.4 | 11.5 | 89.6 |
| #100 | 1.5 | 1.9 | 5.6 | 3.3 | 7.2 | 96.7 |
| LBW | 1.3 | 1.7 | 1.1 | 1.3 | 2.0 | 98.7 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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 SupplierGradations

| Coarseness Factor: | 65 | Workability Factor: | 35 |
|---|---|---|---|




Intial Production Sample (IPS)

| Coarseness Factor: | 65 |
|---|---|
| Workability Factor: | 35 |

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.6 | 0.4 | 0.4 |
| 1" | 83.9 | 15.7 | 16.1 |
| 3/4" | 74.1 | 9.8 | 25.9 |
| 1/2" | 64.3 | 9.7 | 35.7 |
| 3/8" | 57.5 | 6.8 | 42.5 |
| #4 | 44.5 | 13.1 | 55.5 |
| #8 | 35.1 | 9.4 | 64.9 |
| #16 | 27.9 | 7.2 | 72.1 |
| #30 | 21.7 | 6.2 | 78.3 |
| #50 | 12.6 | 9.1 | 87.4 |
| #100 | 3.5 | 9.1 | 96.5 |
| LBW | 1.2 | 2.4 | 98.8 |

PREPARED BY:
SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

Production Gradation Report

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

Contractor: _____

Sample Date: 7/3/23

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 7/4/2023 through 7/10/2023

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft³ | Specific Gravity | % Contribution |
|---|---|---|---|---|---|---|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 750 | 4.59 | 2.62 | 24.4 |
| 2NS | 63-115 | Ray Rd | 1250 | 7.56 | 2.65 | 40.7 |
| | | **Total Wt** | **3070** | **18.69** | | 100.0 |

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

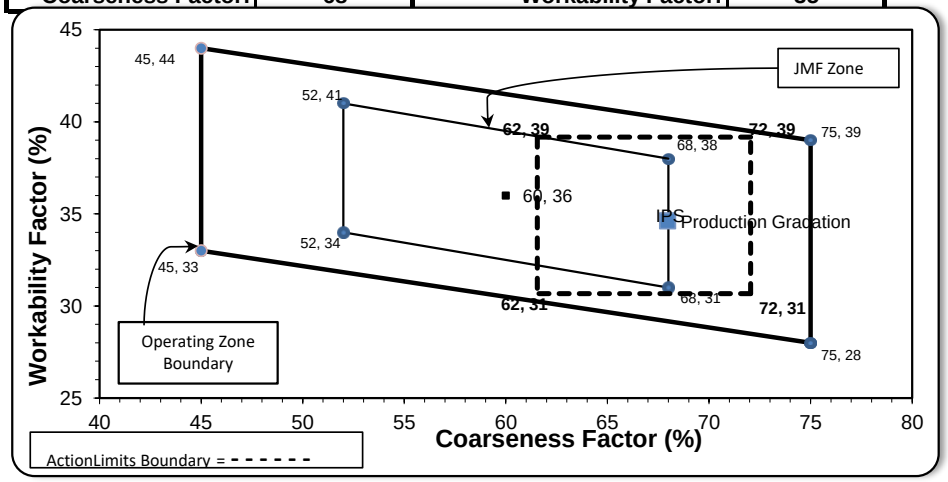
| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|---|---|---|---|---|---|---|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 42.4 | 100.0 | 100.0 | 79.9 | 20.1 | 20.1 |
| 3/4" | 15.3 | 97.9 | 100.0 | 70.0 | 10.0 | 30.0 |
| 1/2" | 5.1 | 76.0 | 100.0 | 61.1 | 8.9 | 38.9 |
| 3/8" | 3.8 | 55.4 | 100.0 | 55.6 | 5.5 | 44.4 |
| #4 | 2.6 | 10.9 | 96.6 | 42.9 | 12.7 | 57.1 |
| #8 | 2.3 | 3.3 | 81.1 | 34.6 | 8.3 | 65.4 |
| #16 | 2.2 | 2.5 | 66.4 | 28.4 | 6.2 | 71.6 |
| #30 | 2.1 | 2.3 | 50.4 | 21.8 | 6.6 | 78.2 |
| #50 | 2.0 | 2.2 | 25.6 | 11.7 | 10.2 | 88.3 |
| #100 | 1.8 | 2.1 | 5.4 | 3.3 | 8.3 | 96.7 |
| LBW | 1.5 | 1.6 | 0.6 | 1.2 | 2.2 | 98.8 |


**Superior Materials, LLC**
30701 W. 10 Mile Rd.
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 SupplierGradations

| Coarseness Factor: | 68 | 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" | 85.0 | 15.0 | 15.0 |
| 3/4" | 72.3 | 12.7 | 27.7 |
| 1/2" | 64.5 | 7.8 | 35.5 |
| 3/8" | 56.5 | 8.0 | 43.5 |
| #4 | 42.7 | 13.8 | 57.3 |
| #8 | 34.9 | 7.8 | 65.1 |
| #16 | 29.0 | 5.9 | 71.0 |
| #30 | 21.0 | 8.0 | 79.0 |
| #50 | 8.2 | 12.8 | 91.8 |
| #100 | 1.6 | 6.5 | 98.4 |
| LBW | 0.7 | 0.9 | 99.3 |

PREPARED BY:
SM, LLC Technical Service

Approved By: