

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 10/26/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1675 | 10.25 | 2.62 | 54.8 |
| 26A | 71-47 | Presque Isle | 150 | 0.92 | 2.62 | 4.9 |
| 2NS | 75-051 | Mid-Michigan | 1230 | 7.41 | 2.66 | 40.3 |
| Total Wt | | | 3055 | 18.57 | | 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" | 98.0 | 100.0 | 100.0 | 98.9 | 1.1 | 1.1 |
| 3/4" | 81.5 | 100.0 | 100.0 | 89.9 | 9.0 | 10.1 |
| 1/2" | 42.9 | 98.1 | 100.0 | 68.6 | 21.3 | 31.4 |
| 3/8" | 25.1 | 91.0 | 100.0 | 58.5 | 10.1 | 41.5 |
| #4 | 4.3 | 16.4 | 97.6 | 42.5 | 16.0 | 57.5 |
| #8 | 2.0 | 4.5 | 79.3 | 33.2 | 9.2 | 66.8 |
| #16 | 1.6 | 2.3 | 61.7 | 25.8 | 7.4 | 74.2 |
| #30 | 1.5 | 1.8 | 45.9 | 19.4 | 6.4 | 80.6 |
| #50 | 1.5 | 1.6 | 22.7 | 10.0 | 9.4 | 90.0 |
| #100 | 1.4 | 1.6 | 4.5 | 2.7 | 7.4 | 97.3 |
| LBW | 1.3 | 1.4 | 0.7 | 1.1 | 1.6 | 98.9 |

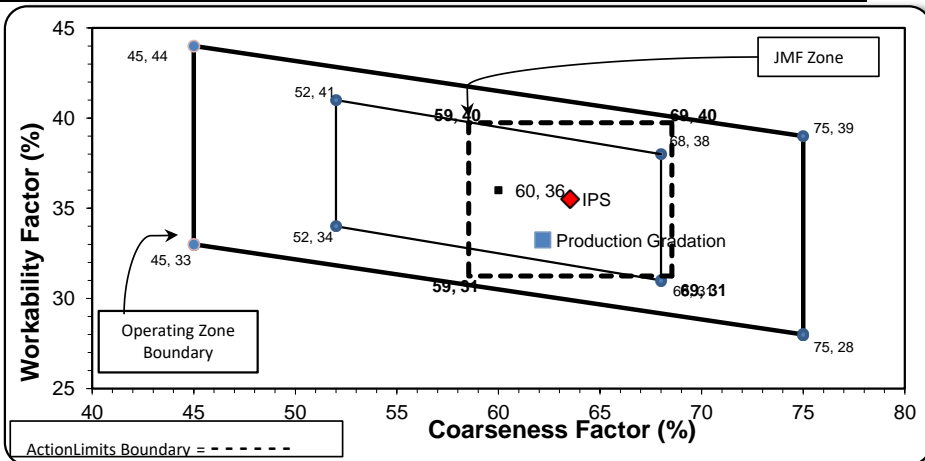
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

| | | | |
|---------------------------|-----------|----------------------------|-----------|
| Coarseness Factor: | 62 | Workability Factor: | 33 |
|---------------------------|-----------|----------------------------|-----------|

Initial Production Sample (IPS)

| Coarseness Factor: | 64 | | |
|----------------------------|----------------------|------------|-----------------------|
| 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" | 93.9 | 6.1 | 6.1 |
| 1/2" | 71.4 | 22.5 | 28.6 |
| 3/8" | 59.0 | 12.4 | 41.0 |
| #4 | 45.1 | 13.9 | 54.9 |
| #8 | 35.5 | 9.6 | 64.5 |
| #16 | 28.3 | 7.2 | 71.7 |
| #30 | 21.3 | 6.9 | 78.7 |
| #50 | 11.0 | 10.3 | 89.0 |
| #100 | 3.4 | 7.6 | 96.6 |
| LBW | 1.1 | 2.3 | 98.9 |



PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 10/26/20 Concrete Grade: **S2M**

Dates Test Represents: 10/27/2020 through 11/2/2020

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1670 | 10.21 | 2.62 | 54.8 |
| 26A | 71-47 | Presque Isle | 150 | 0.92 | 2.62 | 4.9 |
| 2NS | 95-013 | Smelter Bay | 1230 | 7.44 | 2.65 | 40.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



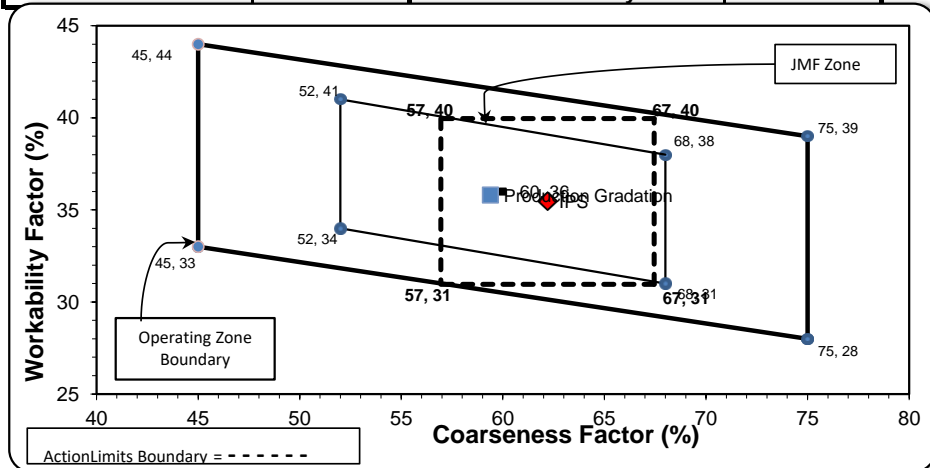
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 98.7 | 100.0 | 100.0 | 99.3 | 0.7 | 0.7 |
| 3/4" | 84.4 | 100.0 | 100.0 | 91.5 | 7.8 | 8.5 |
| 1/2" | 47.9 | 97.4 | 100.0 | 71.3 | 20.1 | 28.7 |
| 3/8" | 31.3 | 89.6 | 100.0 | 61.9 | 9.5 | 38.1 |
| #4 | 5.4 | 17.0 | 96.0 | 42.5 | 19.4 | 57.5 |
| #8 | 3.6 | 4.8 | 83.3 | 35.8 | 6.7 | 64.2 |
| #16 | 2.8 | 2.6 | 67.1 | 28.7 | 7.1 | 71.3 |
| #30 | 2.6 | 2.3 | 46.7 | 20.4 | 8.4 | 79.6 |
| #50 | 2.4 | 2.2 | 22.1 | 10.3 | 10.0 | 89.7 |
| #100 | 2.2 | 2.1 | 6.1 | 3.8 | 6.6 | 96.2 |
| LBW | 1.7 | 1.9 | 1.0 | 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.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **59** **Workability Factor:** **36**



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" | 94.0 | 6.0 | 6.0 |
| 1/2" | 70.2 | 23.7 | 29.8 |
| 3/8" | 59.9 | 10.4 | 40.1 |
| #4 | 42.7 | 17.2 | 57.3 |
| #8 | 35.5 | 7.2 | 64.5 |
| #16 | 28.4 | 7.0 | 71.6 |
| #30 | 19.2 | 9.2 | 80.8 |
| #50 | 8.9 | 10.3 | 91.1 |
| #100 | 3.1 | 5.9 | 96.9 |
| LBW | 1.4 | 1.7 | 98.6 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 10/26/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1700 | 10.40 | 2.62 | 55.7 |
| 26A | 71-47 | Presque Isle | 150 | 0.92 | 2.62 | 4.9 |
| 2NS | 63-92 | Grange Hall | 1200 | 7.26 | 2.65 | 39.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



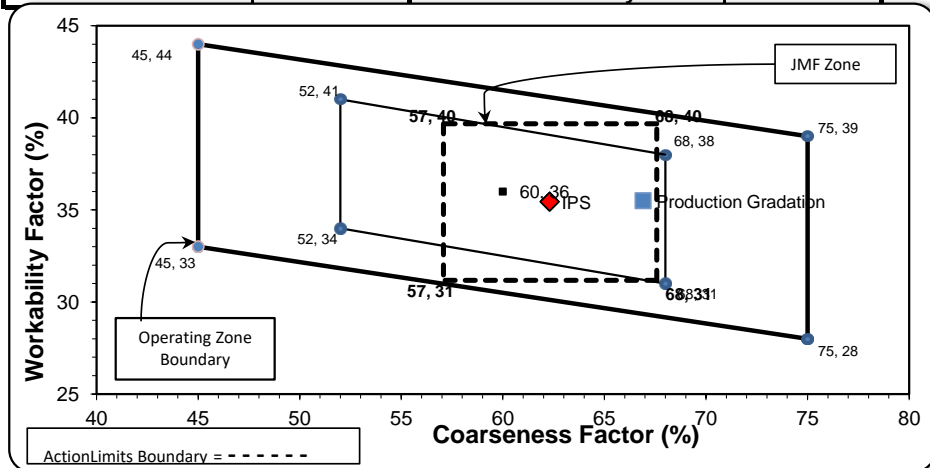
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 96.6 | 100.0 | 100.0 | 98.1 | 1.9 | 1.9 |
| 3/4" | 75.4 | 100.0 | 100.0 | 86.3 | 11.8 | 13.7 |
| 1/2" | 37.4 | 97.4 | 100.0 | 65.0 | 21.3 | 35.0 |
| 3/8" | 23.5 | 89.6 | 100.0 | 56.8 | 8.1 | 43.2 |
| #4 | 5.4 | 17.0 | 97.6 | 42.2 | 14.6 | 57.8 |
| #8 | 2.7 | 4.8 | 85.8 | 35.5 | 6.7 | 64.5 |
| #16 | 2.2 | 2.6 | 70.9 | 29.2 | 6.2 | 70.8 |
| #30 | 2.1 | 2.3 | 48.8 | 20.5 | 8.8 | 79.5 |
| #50 | 2.0 | 2.2 | 18.0 | 8.3 | 12.2 | 91.7 |
| #100 | 1.9 | 2.1 | 2.5 | 2.1 | 6.2 | 97.9 |
| LBW | 1.5 | 1.9 | 0.4 | 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.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **67** **Workability Factor:** **35**



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" | 99.1 | 0.9 | 0.9 |
| 3/4" | 90.5 | 8.6 | 9.5 |
| 1/2" | 69.8 | 20.7 | 30.2 |
| 3/8" | 59.8 | 10.0 | 40.2 |
| #4 | 42.2 | 17.6 | 57.8 |
| #8 | 35.4 | 6.7 | 64.6 |
| #16 | 28.8 | 6.7 | 71.2 |
| #30 | 21.4 | 7.4 | 78.6 |
| #50 | 8.8 | 12.6 | 91.2 |
| #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

PLANT #: P-02

Sample Date: 10/26/20

Concrete Grade: S2M

Contractor: _____

Dates Test Represents: 10/27/2020 through 11/2/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1650 | 10.09 | 2.62 | 54.1 |
| 26A | 71-47 | Presque Isle | 100 | 0.61 | 2.62 | 3.3 |
| 2NS | 63-115 | Ray Rd | 1300 | 7.86 | 2.65 | 42.6 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



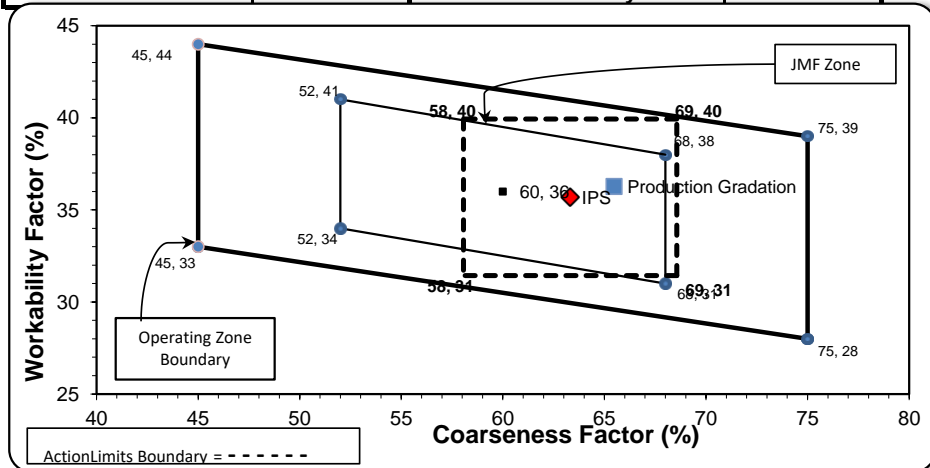
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 96.6 | 100.0 | 100.0 | 98.2 | 1.8 | 1.8 |
| 3/4" | 75.4 | 100.0 | 100.0 | 86.7 | 11.5 | 13.3 |
| 1/2" | 37.4 | 97.4 | 100.0 | 66.0 | 20.6 | 34.0 |
| 3/8" | 23.5 | 89.6 | 100.0 | 58.3 | 7.8 | 41.7 |
| #4 | 5.4 | 17.0 | 98.0 | 45.2 | 13.0 | 54.8 |
| #8 | 2.7 | 4.8 | 81.3 | 36.3 | 9.0 | 63.7 |
| #16 | 2.2 | 2.6 | 64.6 | 28.8 | 7.5 | 71.2 |
| #30 | 2.1 | 2.3 | 48.2 | 21.8 | 7.1 | 78.2 |
| #50 | 2.0 | 2.2 | 21.8 | 10.4 | 11.3 | 89.6 |
| #100 | 1.9 | 2.1 | 3.6 | 2.6 | 7.8 | 97.4 |
| LBW | 1.5 | 1.9 | 0.3 | 1.0 | 1.6 | 99.0 |

*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: 65 **Workability Factor:** 36



Initial 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" | 95.6 | 4.4 | 4.4 |
| 1/2" | 73.1 | 22.6 | 26.9 |
| 3/8" | 59.3 | 13.8 | 40.7 |
| #4 | 42.8 | 16.5 | 57.2 |
| #8 | 35.7 | 7.1 | 64.3 |
| #16 | 28.9 | 6.8 | 71.1 |
| #30 | 20.7 | 8.2 | 79.3 |
| #50 | 9.9 | 10.8 | 90.1 |
| #100 | 2.1 | 7.8 | 97.9 |
| LBW | 0.9 | 1.2 | 99.1 |

PREPARED BY:
 SM, LLC Technical Service

Approved By: