

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 2/24/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 2/25/2020 through 3/2/2020

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 | 100 | 0.61 | 2.62 | 3.3 |
| 2NS | 63-115 | Ray Rd | 1280 | 7.74 | 2.65 | 42.0 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



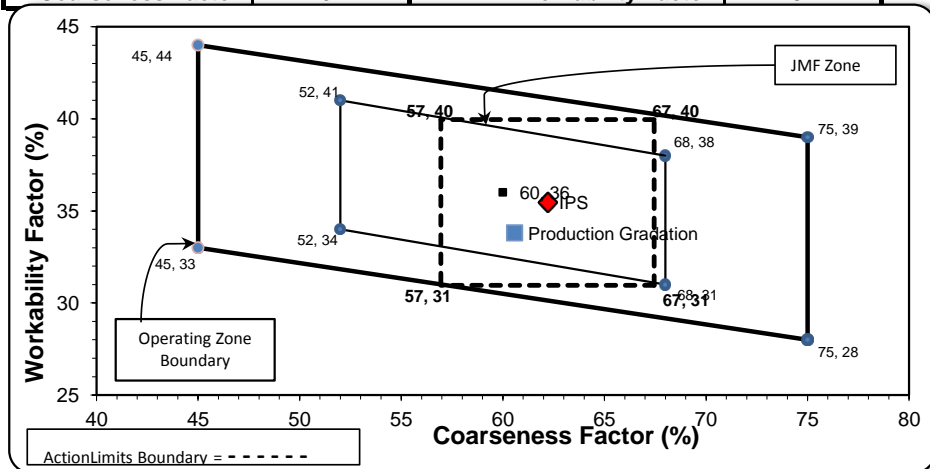
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.9 | 100.0 | 100.0 | 98.9 | 1.1 | 1.1 |
| 3/4" | 85.5 | 100.0 | 100.0 | 92.1 | 6.8 | 7.9 |
| 1/2" | 45.1 | 99.0 | 100.0 | 69.9 | 22.2 | 30.1 |
| 3/8" | 28.4 | 72.3 | 100.0 | 59.9 | 10.0 | 40.1 |
| #4 | 4.7 | 16.2 | 95.7 | 43.3 | 16.6 | 56.7 |
| #8 | 2.0 | 6.6 | 77.4 | 33.8 | 9.5 | 66.2 |
| #16 | 1.7 | 4.4 | 61.6 | 26.9 | 6.9 | 73.1 |
| #30 | 1.6 | 4.0 | 47.2 | 20.8 | 6.1 | 79.2 |
| #50 | 1.5 | 3.6 | 25.1 | 11.5 | 9.3 | 88.5 |
| #100 | 1.4 | 3.4 | 5.5 | 3.2 | 8.3 | 96.8 |
| LBW | 1.1 | 2.8 | 0.8 | 1.0 | 2.2 | 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: | 61 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



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: 2/24/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 2/25/2020 through 3/2/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1750 | 10.70 | 2.62 | 57.4 |
| 26A | 71-47 | Presque Isle | 100 | 0.61 | 2.62 | 3.3 |
| 2NS | 63-92 | Grange Hall | 1200 | 7.26 | 2.65 | 39.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



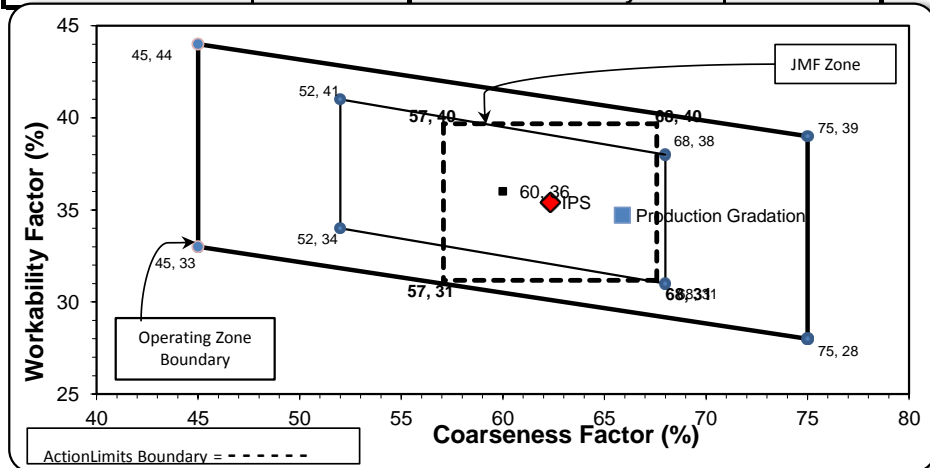
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.9 | 100.0 | 100.0 | 98.8 | 1.2 | 1.2 |
| 3/4" | 86.3 | 100.0 | 100.0 | 92.1 | 6.7 | 7.9 |
| 1/2" | 50.7 | 99.0 | 100.0 | 71.7 | 20.5 | 28.3 |
| 3/8" | 26.6 | 72.3 | 100.0 | 57.0 | 14.7 | 43.0 |
| #4 | 4.2 | 16.2 | 97.4 | 41.3 | 15.7 | 58.7 |
| #8 | 2.3 | 6.6 | 84.3 | 34.7 | 6.6 | 65.3 |
| #16 | 1.9 | 4.4 | 69.6 | 28.6 | 6.1 | 71.4 |
| #30 | 1.7 | 4.0 | 49.3 | 20.5 | 8.1 | 79.5 |
| #50 | 1.6 | 3.6 | 18.6 | 8.4 | 12.1 | 91.6 |
| #100 | 1.5 | 3.4 | 2.6 | 2.0 | 6.4 | 98.0 |
| LBW | 1.1 | 2.8 | 0.3 | 0.8 | 1.2 | 99.2 |

*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: | 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-39**

Contractor: _____

Sample Date: 2/24/20

Concrete Grade: **S2M**

Dates Test Represents: 2/25/2020 through 3/2/2020

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%



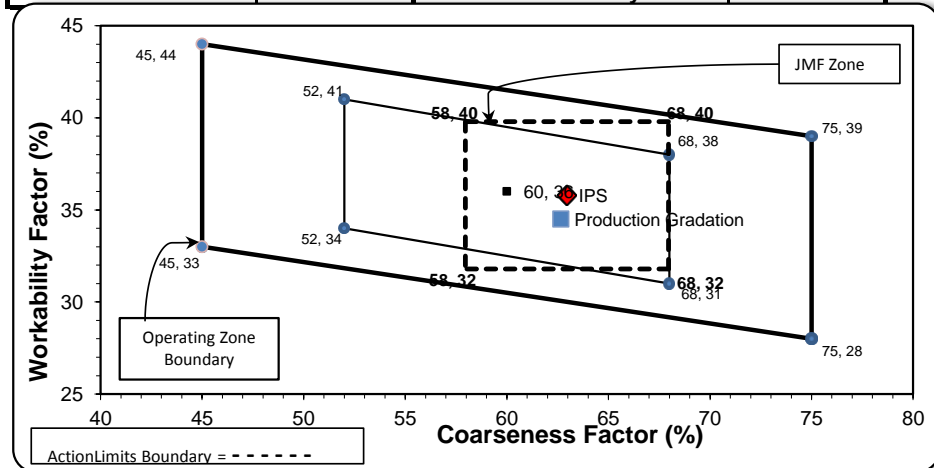
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 98.8 | 100.0 | 100.0 | 99.3 | 0.7 | 0.7 |
| 3/4" | 89.0 | 100.0 | 100.0 | 93.9 | 5.5 | 6.1 |
| 1/2" | 49.7 | 99.0 | 100.0 | 71.9 | 22.0 | 28.1 |
| 3/8" | 28.8 | 72.3 | 100.0 | 59.0 | 13.0 | 41.0 |
| #4 | 3.7 | 16.2 | 97.4 | 41.2 | 17.8 | 58.8 |
| #8 | 1.8 | 6.6 | 84.3 | 34.5 | 6.7 | 65.5 |
| #16 | 1.6 | 4.4 | 69.6 | 28.5 | 6.0 | 71.5 |
| #30 | 1.5 | 4.0 | 49.3 | 20.4 | 8.1 | 79.6 |
| #50 | 1.4 | 3.6 | 18.6 | 8.3 | 12.2 | 91.7 |
| #100 | 1.4 | 3.4 | 2.6 | 2.0 | 6.3 | 98.0 |
| LBW | 1.2 | 2.8 | 0.3 | 0.9 | 1.0 | 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.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

| | | | |
|---------------------------|-----------|----------------------------|-----------|
| Coarseness Factor: | 63 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



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" | 89.8 | 10.2 | 10.2 |
| 1/2" | 70.7 | 19.1 | 29.3 |
| 3/8" | 59.6 | 11.1 | 40.4 |
| #4 | 43.2 | 16.4 | 56.8 |
| #8 | 35.8 | 7.4 | 64.2 |
| #16 | 29.2 | 6.6 | 70.8 |
| #30 | 21.4 | 7.8 | 78.6 |
| #50 | 9.8 | 11.6 | 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

PLANT #: **P-02**

Sample Date: 2/24/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 2/25/2020 through 3/2/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1750 | 10.70 | 2.62 | 57.4 |
| 26A | 71-47 | Presque Isle | 0 | 0.00 | 2.62 | 0.0 |
| 2NS | 63-115 | Ray Rd | 1300 | 7.86 | 2.65 | 42.6 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



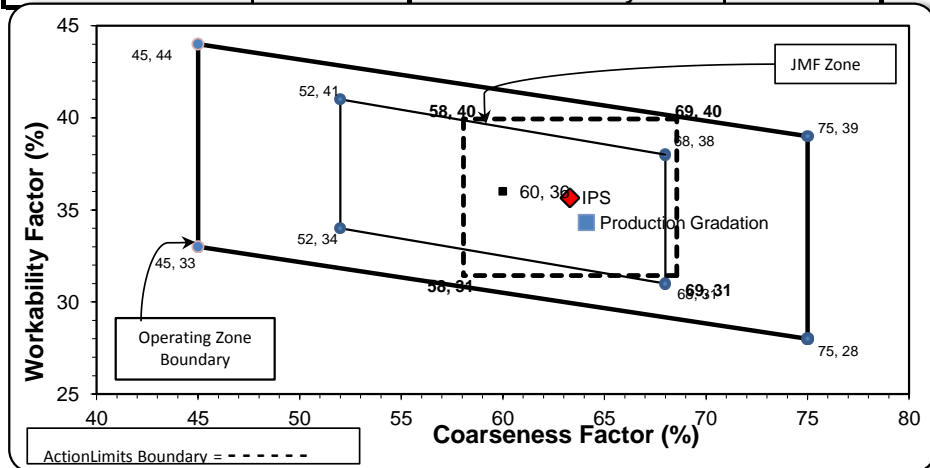
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.9 | 100.0 | 100.0 | 98.8 | 1.2 | 1.2 |
| 3/4" | 86.3 | 100.0 | 100.0 | 92.1 | 6.7 | 7.9 |
| 1/2" | 50.7 | 99.0 | 100.0 | 71.7 | 20.4 | 28.3 |
| 3/8" | 26.6 | 72.3 | 100.0 | 57.9 | 13.8 | 42.1 |
| #4 | 4.2 | 16.2 | 95.7 | 43.2 | 14.7 | 56.8 |
| #8 | 2.3 | 6.6 | 77.4 | 34.3 | 8.9 | 65.7 |
| #16 | 1.9 | 4.4 | 61.6 | 27.3 | 7.0 | 72.7 |
| #30 | 1.7 | 4.0 | 47.2 | 21.1 | 6.3 | 78.9 |
| #50 | 1.6 | 3.6 | 25.1 | 11.6 | 9.5 | 88.4 |
| #100 | 1.5 | 3.4 | 5.5 | 3.2 | 8.4 | 96.8 |
| LBW | 1.1 | 2.8 | 0.8 | 1.0 | 2.2 | 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: | 64 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



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: