

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 5/11/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|----------|--------------|-----------------|------------------|----------------|
| 6AA | 58-003 | Stoneco | 1640 | 9.77 | 2.69 | 52.9 |
| 26A | 58-003 | Stoneco | 250 | 1.49 | 2.69 | 8.1 |
| 2NS | 63-114 | Highland | 1210 | 7.32 | 2.65 | 39.0 |
| Total Wt | | | 3100 | 18.58 | | 100.0 |

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



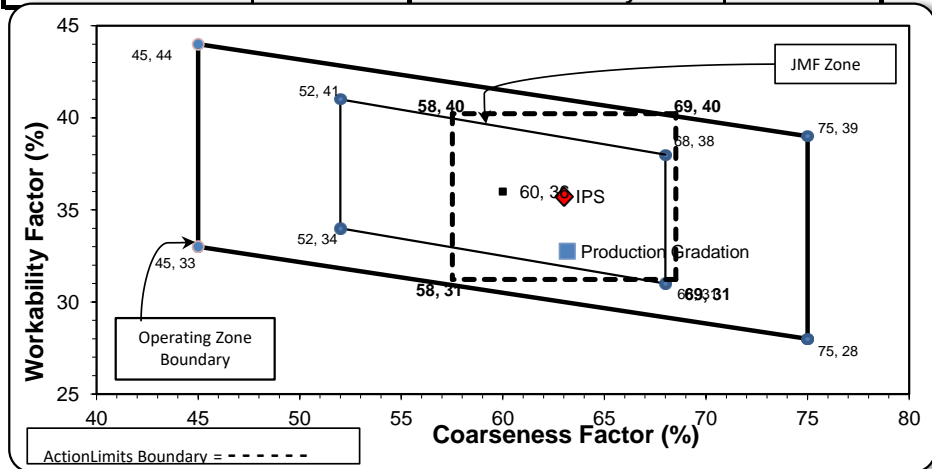
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 3/4" | 84.9 | 100.0 | 100.0 | 92.0 | 8.0 | 8.0 |
| 1/2" | 44.8 | 99.6 | 100.0 | 70.8 | 21.2 | 29.2 |
| 3/8" | 21.9 | 85.6 | 100.0 | 57.5 | 13.2 | 42.5 |
| #4 | 3.4 | 21.6 | 99.1 | 42.2 | 15.3 | 57.8 |
| #8 | 1.5 | 4.3 | 81.0 | 32.8 | 9.5 | 67.2 |
| #16 | 1.3 | 2.0 | 61.8 | 25.0 | 7.8 | 75.0 |
| #30 | 1.2 | 1.6 | 43.6 | 17.8 | 7.2 | 82.2 |
| #50 | 1.1 | 1.4 | 18.2 | 7.8 | 10.0 | 92.2 |
| #100 | 1.0 | 1.4 | 3.5 | 2.0 | 5.8 | 98.0 |
| LBW | 0.7 | 1.2 | 0.4 | 0.6 | 1.4 | 99.4 |

*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:** **33**



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" | 99.2 | 0.8 | 0.8 |
| 3/4" | 90.9 | 8.3 | 9.1 |
| 1/2" | 71.3 | 19.6 | 28.7 |
| 3/8" | 59.5 | 11.8 | 40.5 |
| #4 | 43.8 | 15.7 | 56.2 |
| #8 | 35.7 | 8.1 | 64.3 |
| #16 | 27.0 | 8.7 | 73.0 |
| #30 | 18.6 | 8.4 | 81.4 |
| #50 | 6.8 | 11.8 | 93.2 |
| #100 | 1.4 | 5.4 | 98.6 |
| LBW | 0.6 | 0.8 | 99.4 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-12**

Sample Date: 5/11/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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 | 120 | 0.73 | 2.62 | 3.9 |
| 2NS | 63-115 | Ray Rd | 1230 | 7.44 | 2.65 | 40.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



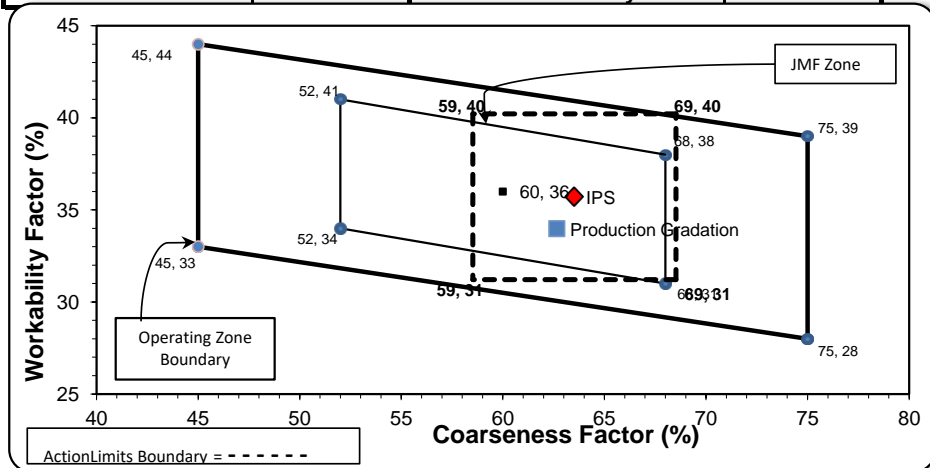
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.0 | 100.0 | 100.0 | 98.3 | 1.7 | 1.7 |
| 3/4" | 78.3 | 100.0 | 100.0 | 87.9 | 10.4 | 12.1 |
| 1/2" | 42.7 | 97.1 | 100.0 | 67.9 | 20.0 | 32.1 |
| 3/8" | 26.8 | 85.7 | 100.0 | 58.6 | 9.3 | 41.4 |
| #4 | 6.4 | 26.6 | 98.4 | 44.3 | 14.3 | 55.7 |
| #8 | 3.3 | 8.2 | 78.9 | 34.0 | 10.3 | 66.0 |
| #16 | 2.6 | 4.3 | 61.0 | 26.2 | 7.8 | 73.8 |
| #30 | 2.4 | 3.6 | 45.6 | 19.9 | 6.3 | 80.1 |
| #50 | 2.1 | 3.4 | 23.4 | 10.7 | 9.1 | 89.3 |
| #100 | 1.8 | 3.2 | 4.5 | 2.9 | 7.8 | 97.1 |
| LBW | 1.4 | 2.7 | 0.9 | 1.2 | 1.7 | 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:** **34**



Initial Production Sample (IPS)

Coarseness Factor: **64**
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" | 99.2 | 0.8 | 0.8 |
| 3/4" | 90.9 | 8.3 | 9.1 |
| 1/2" | 71.3 | 19.6 | 28.7 |
| 3/8" | 59.2 | 12.1 | 40.8 |
| #4 | 41.5 | 17.7 | 58.5 |
| #8 | 35.7 | 5.8 | 64.3 |
| #16 | 27.9 | 7.9 | 72.1 |
| #30 | 18.3 | 9.5 | 81.7 |
| #50 | 7.3 | 11.0 | 92.7 |
| #100 | 2.0 | 5.3 | 98.0 |
| LBW | 0.9 | 1.1 | 99.1 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 5/11/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1420 | 8.69 | 2.62 | 46.6 |
| 26A | 71-47 | Presque Isle | 400 | 2.45 | 2.62 | 13.1 |
| 2NS | 95-013 | Smelter Bay | 1230 | 7.44 | 2.65 | 40.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



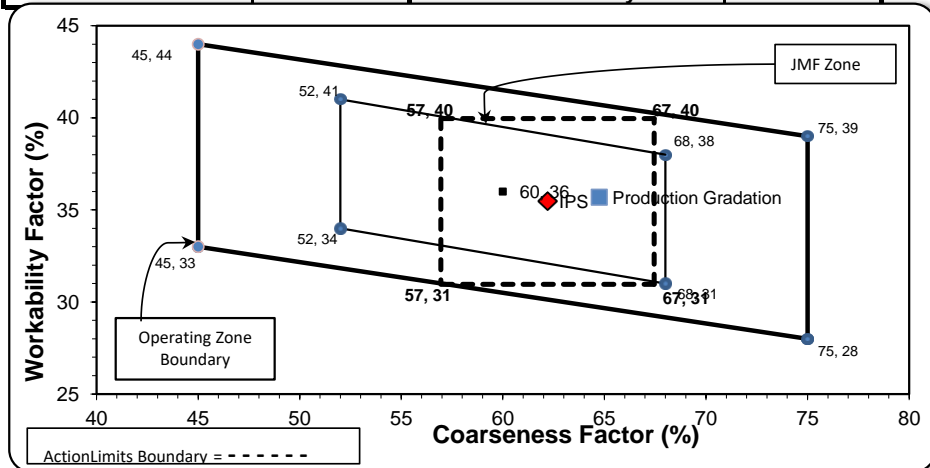
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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 | 99.4 | 0.6 | 0.6 |
| 3/4" | 72.1 | 100.0 | 100.0 | 87.0 | 12.4 | 13.0 |
| 1/2" | 30.8 | 97.1 | 100.0 | 67.4 | 19.6 | 32.6 |
| 3/8" | 14.6 | 85.7 | 100.0 | 58.4 | 9.0 | 41.6 |
| #4 | 3.4 | 26.6 | 95.4 | 43.5 | 14.8 | 56.5 |
| #8 | 2.2 | 8.2 | 83.3 | 35.7 | 7.9 | 64.3 |
| #16 | 1.9 | 4.3 | 68.4 | 29.0 | 6.7 | 71.0 |
| #30 | 1.5 | 3.6 | 48.8 | 20.9 | 8.2 | 79.1 |
| #50 | 1.4 | 3.4 | 21.6 | 9.8 | 11.0 | 90.2 |
| #100 | 1.3 | 3.2 | 5.5 | 3.2 | 6.6 | 96.8 |
| LBW | 1.0 | 2.7 | 1.5 | 1.4 | 1.8 | 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: **65** **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: 5/11/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1600 | 9.79 | 2.62 | 52.5 |
| 26A | 71-47 | Presque Isle | 250 | 1.53 | 2.62 | 8.2 |
| 2NS | 63-92 | Grange Hall | 1200 | 7.26 | 2.65 | 39.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



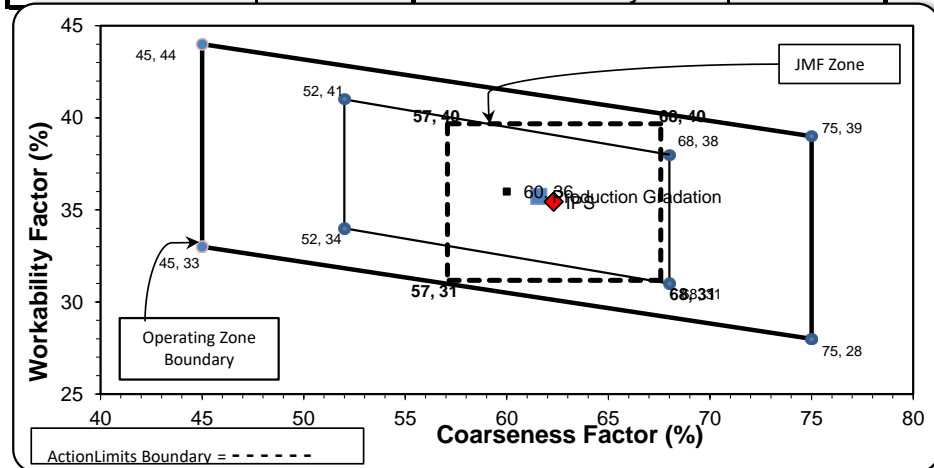
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.0 | 100.0 | 100.0 | 98.4 | 1.6 | 1.6 |
| 3/4" | 78.3 | 100.0 | 100.0 | 88.6 | 9.8 | 11.4 |
| 1/2" | 42.7 | 97.1 | 100.0 | 69.7 | 18.9 | 30.3 |
| 3/8" | 26.8 | 85.7 | 100.0 | 60.4 | 9.3 | 39.6 |
| #4 | 6.4 | 26.6 | 97.3 | 43.8 | 16.6 | 56.2 |
| #8 | 3.3 | 8.2 | 84.7 | 35.7 | 8.1 | 64.3 |
| #16 | 2.6 | 4.3 | 69.7 | 29.1 | 6.6 | 70.9 |
| #30 | 2.4 | 3.6 | 50.9 | 21.6 | 7.6 | 78.4 |
| #50 | 2.1 | 3.4 | 23.3 | 10.5 | 11.0 | 89.5 |
| #100 | 1.8 | 3.2 | 3.2 | 2.5 | 8.1 | 97.5 |
| LBW | 1.4 | 2.7 | 0.5 | 1.2 | 1.3 | 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: | 62 | Workability Factor: | 36 |
|---------------------------|-----------|----------------------------|-----------|



Intial 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**

Sample Date: 5/11/20

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 5/12/2020 through 5/18/2020

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 | 44-051 | Krake Willis Rd | 1200 | 7.26 | 2.65 | 39.3 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



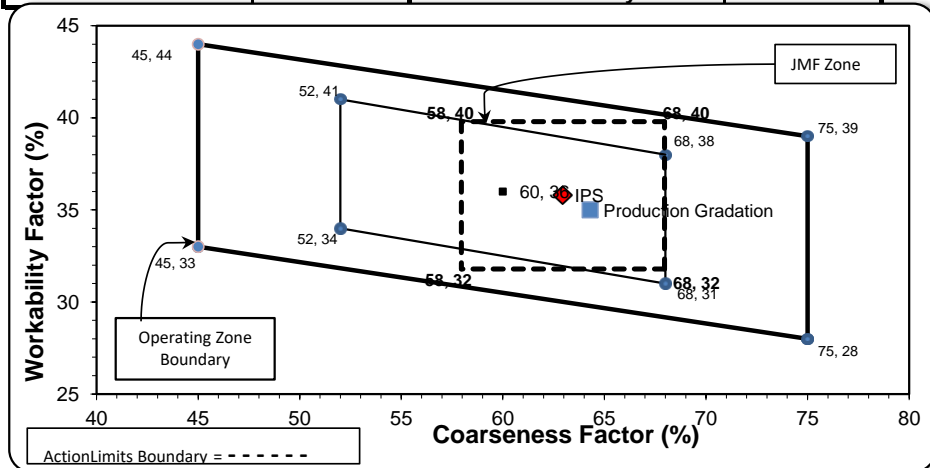
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.1 | 100.0 | 100.0 | 98.4 | 1.6 | 1.6 |
| 3/4" | 82.3 | 100.0 | 100.0 | 90.1 | 8.2 | 9.9 |
| 1/2" | 43.4 | 97.5 | 100.0 | 68.3 | 21.8 | 31.7 |
| 3/8" | 26.1 | 87.7 | 100.0 | 58.2 | 10.1 | 41.8 |
| #4 | 4.3 | 23.8 | 97.6 | 42.0 | 16.2 | 58.0 |
| #8 | 2.4 | 6.1 | 84.8 | 35.0 | 7.0 | 65.0 |
| #16 | 2.0 | 2.6 | 70.0 | 28.8 | 6.2 | 71.2 |
| #30 | 1.9 | 2.0 | 51.0 | 21.2 | 7.6 | 78.8 |
| #50 | 1.8 | 1.9 | 23.4 | 10.3 | 10.9 | 89.7 |
| #100 | 1.7 | 1.8 | 3.8 | 2.5 | 7.8 | 97.5 |
| LBW | 1.6 | 1.8 | 0.7 | 1.3 | 1.3 | 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: **64** **Workability Factor:** **35**



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: 5/11/20 Concrete Grade: **S2M**
 Dates Test Represents: 5/12/2020 through 5/18/2020

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1600 | 9.79 | 2.62 | 52.5 |
| 26A | 71-47 | Presque Isle | 150 | 0.92 | 2.62 | 4.9 |
| 2NS | 63-115 | Ray Rd | 1300 | 7.86 | 2.65 | 42.6 |
| Total Wt | | | 3050 | 18.57 | | 100.0 |

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



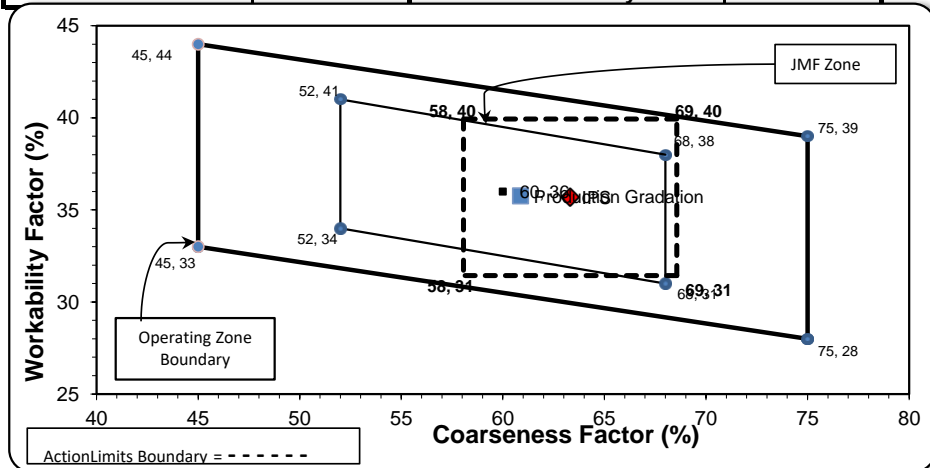
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 97.0 | 100.0 | 100.0 | 98.4 | 1.6 | 1.6 |
| 3/4" | 78.3 | 100.0 | 100.0 | 88.6 | 9.8 | 11.4 |
| 1/2" | 42.7 | 97.1 | 100.0 | 69.8 | 18.8 | 30.2 |
| 3/8" | 26.8 | 85.7 | 100.0 | 60.9 | 8.9 | 39.1 |
| #4 | 6.4 | 26.6 | 98.4 | 46.6 | 14.3 | 53.4 |
| #8 | 3.3 | 8.2 | 78.9 | 35.8 | 10.8 | 64.2 |
| #16 | 2.6 | 4.3 | 61.0 | 27.6 | 8.2 | 72.4 |
| #30 | 2.4 | 3.6 | 45.6 | 20.9 | 6.7 | 79.1 |
| #50 | 2.1 | 3.4 | 23.4 | 11.2 | 9.6 | 88.8 |
| #100 | 1.8 | 3.2 | 4.5 | 3.0 | 8.2 | 97.0 |
| LBW | 1.4 | 2.7 | 0.9 | 1.3 | 1.8 | 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:** **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: