

Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

PLANT #: **P-102**

Sample Date: 12/3/18

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|---------|--------------|-----------------|------------------|----------------|
| 6AA | 58-003 | Stoneco | 1550 | 9.23 | 2.69 | 49.1 |
| 26A | 58-003 | Stoneco | 350 | 2.09 | 2.69 | 11.1 |
| 2NS | 47-16 | Buno Rd | 1260 | 7.62 | 2.65 | 39.9 |
| Total Wt | | | 3160 | 18.94 | | 100.0 |

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



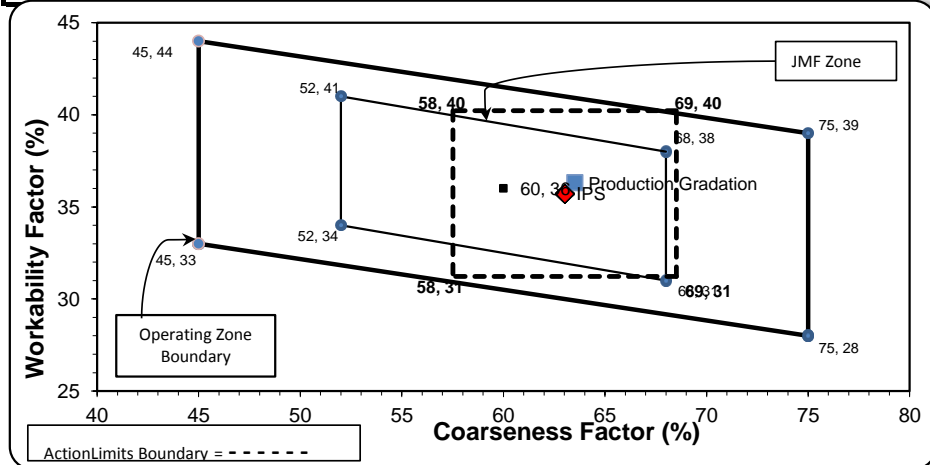
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 99.7 | 100.0 | 100.0 | 99.9 | 0.1 | 0.1 |
| 3/4" | 82.7 | 100.0 | 100.0 | 91.5 | 8.3 | 8.5 |
| 1/2" | 43.3 | 99.6 | 100.0 | 72.1 | 19.4 | 27.9 |
| 3/8" | 20.6 | 86.4 | 100.0 | 59.5 | 12.6 | 40.5 |
| #4 | 4.6 | 19.8 | 96.2 | 42.8 | 16.7 | 57.2 |
| #8 | 2.4 | 6.2 | 86.4 | 36.3 | 6.5 | 63.7 |
| #16 | 1.8 | 3.0 | 73.3 | 30.4 | 5.9 | 69.6 |
| #30 | 1.7 | 2.4 | 54.2 | 22.7 | 7.7 | 77.3 |
| #50 | 1.6 | 2.0 | 19.2 | 8.7 | 14.0 | 91.3 |
| #100 | 1.5 | 1.9 | 2.4 | 1.9 | 6.8 | 98.1 |
| LBW | 1.3 | 1.6 | 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: **64** 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" | 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

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

PLANT #: **P-32**

Sample Date: 12/3/18

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1400 | 8.56 | 2.62 | 45.0 |
| 26A | 71-47 | Presque Isle | 480 | 2.94 | 2.62 | 15.4 |
| 2NS | 95-13 | Smelter Bay | 1230 | 7.44 | 2.65 | 39.5 |
| Total Wt | | | 3110 | 18.94 | | 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" | 86.0 | 100.0 | 100.0 | 93.7 | 6.3 | 6.3 |
| 1/2" | 39.6 | 96.5 | 100.0 | 72.3 | 21.4 | 27.7 |
| 3/8" | 18.4 | 74.9 | 100.0 | 59.4 | 12.9 | 40.6 |
| #4 | 2.8 | 5.0 | 98.1 | 40.8 | 18.6 | 59.2 |
| #8 | 2.0 | 1.4 | 85.7 | 35.0 | 5.8 | 65.0 |
| #16 | 1.8 | 1.0 | 69.2 | 28.3 | 6.7 | 71.7 |
| #30 | 1.8 | 0.9 | 48.7 | 20.2 | 8.1 | 79.8 |
| #50 | 1.6 | 0.8 | 20.7 | 9.0 | 11.2 | 91.0 |
| #100 | 1.6 | 0.7 | 3.9 | 2.4 | 6.7 | 97.6 |
| LBW | 1.1 | 0.5 | 0.6 | 0.8 | 1.6 | 99.2 |

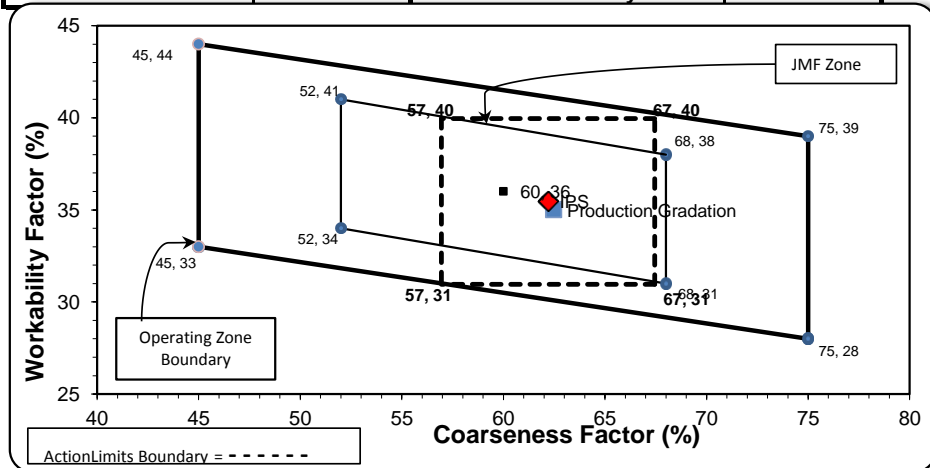
*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max., nom. max., #100 and #200 sieves.
 *% Retained must be at least 8% for the 1" sieve when a 2" max. size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



Superior Materials, LLC
 30701 W. 10 Mile Rd.
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Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 62 **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" | 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

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

PLANT #: **P-36**

Sample Date: 12/3/18

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|----------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1500 | 9.17 | 2.62 | 48.2 |
| 26A | 71-47 | Presque Isle | 360 | 2.20 | 2.62 | 11.6 |
| 2NS | 63-92 | AA Grange Hall | 1250 | 7.56 | 2.65 | 40.2 |
| Total Wt | | | 3110 | 18.94 | | 100.0 |

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



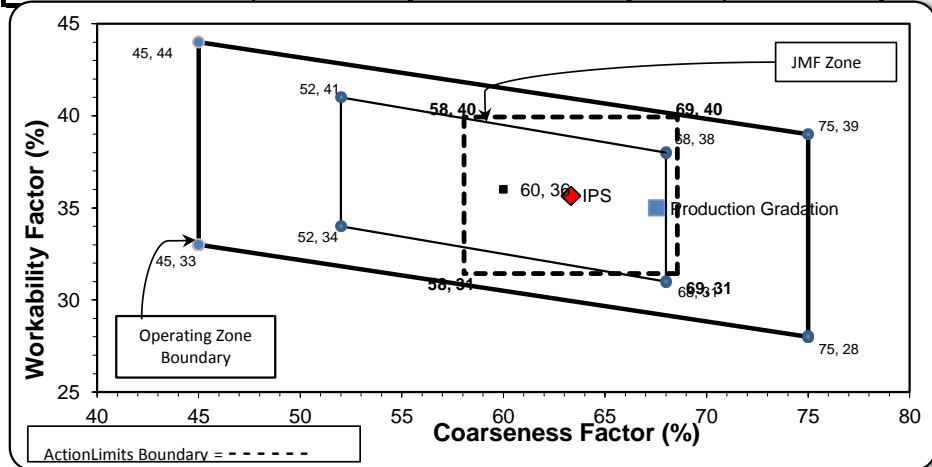
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 99.8 | 100.0 | 100.0 | 99.9 | 0.1 | 0.1 |
| 3/4" | 86.4 | 100.0 | 100.0 | 93.4 | 6.5 | 6.6 |
| 1/2" | 38.7 | 96.5 | 100.0 | 70.0 | 23.4 | 30.0 |
| 3/8" | 15.0 | 74.9 | 100.0 | 56.1 | 13.9 | 43.9 |
| #4 | 2.1 | 5.0 | 97.7 | 40.9 | 15.2 | 59.1 |
| #8 | 1.4 | 1.4 | 85.0 | 35.0 | 5.9 | 65.0 |
| #16 | 1.2 | 1.0 | 69.0 | 28.4 | 6.6 | 71.6 |
| #30 | 1.1 | 0.9 | 48.1 | 20.0 | 8.5 | 80.0 |
| #50 | 1.1 | 0.8 | 18.6 | 8.1 | 11.9 | 91.9 |
| #100 | 1.0 | 0.7 | 2.6 | 1.6 | 6.5 | 98.4 |
| LBW | 0.7 | 0.5 | 0.3 | 0.5 | 1.1 | 99.5 |

*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 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| 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:

Aggregate Optimization Chart

MIX ID'S: DDS257E7 and DDS257E8

Production Gradation Report

PLANT #: **P-02**

Sample Date: 12/3/18

Concrete Grade: **S2M**

Contractor: _____

Dates Test Represents: 12/4/2018 through 12/10/2018

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|----------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1500 | 9.17 | 2.62 | 48.2 |
| 26A | 71-47 | Presque Isle | 360 | 2.20 | 2.62 | 11.6 |
| 2NS | 63-92 | AA Grange Hall | 1250 | 7.56 | 2.65 | 40.2 |
| Total Wt | | | 3110 | 18.94 | | 100.0 |

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



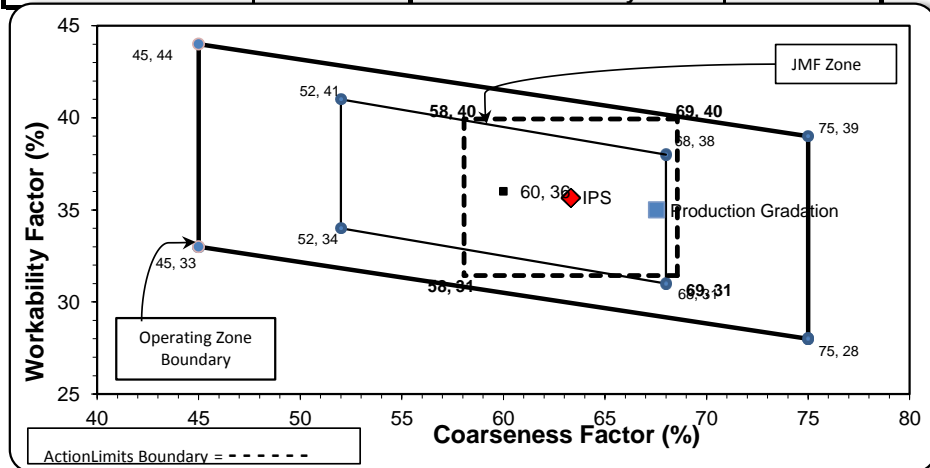
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 99.8 | 100.0 | 100.0 | 99.9 | 0.1 | 0.1 |
| 3/4" | 86.4 | 100.0 | 100.0 | 93.4 | 6.5 | 6.6 |
| 1/2" | 38.7 | 96.5 | 100.0 | 70.0 | 23.4 | 30.0 |
| 3/8" | 15.0 | 74.9 | 100.0 | 56.1 | 13.9 | 43.9 |
| #4 | 2.1 | 5.0 | 97.7 | 40.9 | 15.2 | 59.1 |
| #8 | 1.4 | 1.4 | 85.0 | 35.0 | 5.9 | 65.0 |
| #16 | 1.2 | 1.0 | 69.0 | 28.4 | 6.6 | 71.6 |
| #30 | 1.1 | 0.9 | 48.1 | 20.0 | 8.5 | 80.0 |
| #50 | 1.1 | 0.8 | 18.6 | 8.1 | 11.9 | 91.9 |
| #100 | 1.0 | 0.7 | 2.6 | 1.6 | 6.5 | 98.4 |
| LBW | 0.7 | 0.5 | 0.3 | 0.5 | 1.1 | 99.5 |

*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 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| 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: