

# Aggregate Optimization Chart

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

Sample Date: 10/2/23 Concrete Grade: **S2M, 3500HP**  
 Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle | 1525         | 9.33            | 2.62             | 49.9           |
| 26A             | 71-47  | Presque Isle | 300          | 1.83            | 2.62             | 9.8            |
| 2NS             | 75-051 | Mid Michigan | 1230         | 7.41            | 2.66             | 40.3           |
| <b>Total Wt</b> |        |              | <b>3055</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

<---- 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"    | 98.5  | 100.0 | 100.0 | 99.3                 | 0.7        | 0.7                   |
| 3/4"  | 79.4  | 100.0 | 100.0 | 89.7                 | 9.5        | 10.3                  |
| 1/2"  | 36.1  | 94.6  | 100.0 | 67.6                 | 22.1       | 32.4                  |
| 3/8"  | 19.6  | 84.1  | 100.0 | 58.3                 | 9.3        | 41.7                  |
| #4    | 3.4   | 20.2  | 96.3  | 42.5                 | 15.9       | 57.5                  |
| #8    | 2.4   | 4.6   | 81.6  | 34.5                 | 7.9        | 65.5                  |
| #16   | 2.2   | 2.3   | 67.6  | 28.5                 | 6.0        | 71.5                  |
| #30   | 2.1   | 1.8   | 52.8  | 22.5                 | 6.1        | 77.5                  |
| #50   | 2.0   | 1.7   | 27.2  | 12.1                 | 10.4       | 87.9                  |
| #100  | 1.9   | 1.6   | 7.8   | 4.2                  | 7.9        | 95.8                  |
| LBW   | 1.6   | 1.4   | 1.0   | 1.3                  | 2.9        | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

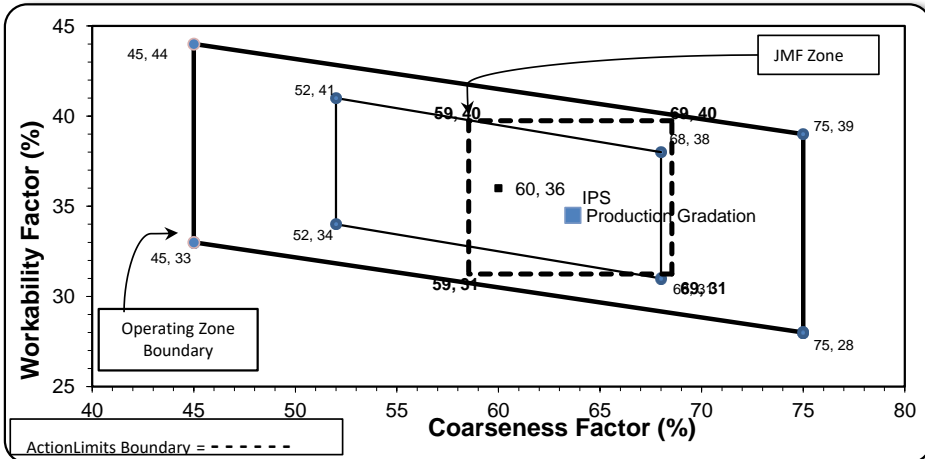
**Coarseness Factor:** **64** **Workability Factor:** **35**

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-102**

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1550         | 9.23            | 2.69             | 50.0           |
| 26A             | 58-003 | Stoneco       | 350          | 2.09            | 2.69             | 11.3           |
| 2NS             | 81-019 | Pleasant Lake | 1200         | 7.26            | 2.65             | 38.7           |
| <b>Total Wt</b> |        |               | <b>3100</b>  | <b>18.58</b>    |                  | <b>100.0</b>   |

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



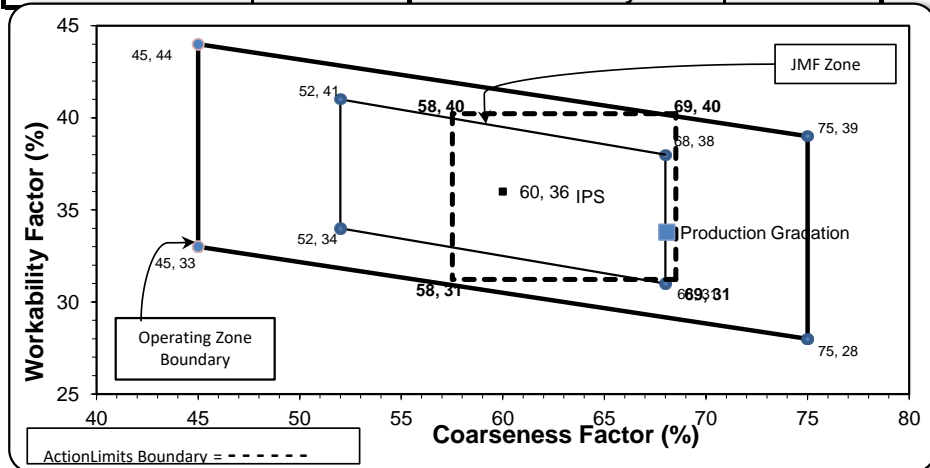
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 80.2  | 100.0 | 100.0 | 90.1                 | 9.9        | 9.9                   |
| 1/2"  | 35.4  | 98.6  | 100.0 | 67.5                 | 22.6       | 32.5                  |
| 3/8"  | 12.8  | 87.0  | 100.0 | 54.9                 | 12.6       | 45.1                  |
| #4    | 2.8   | 5.0   | 98.4  | 40.1                 | 14.9       | 59.9                  |
| #8    | 1.8   | 1.6   | 84.5  | 33.8                 | 6.3        | 66.2                  |
| #16   | 1.6   | 1.3   | 65.7  | 26.4                 | 7.4        | 73.6                  |
| #30   | 1.6   | 1.2   | 45.5  | 18.5                 | 7.8        | 81.5                  |
| #50   | 1.5   | 1.1   | 21.5  | 9.2                  | 9.4        | 90.8                  |
| #100  | 1.4   | 1.0   | 4.2   | 2.4                  | 6.8        | 97.6                  |
| LBW   | 1.0   | 0.8   | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **68**      **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"    | 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-103**

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1550         | 9.23            | 2.69             | 50.0           |
| 26A             | 58-003 | Stoneco       | 350          | 2.09            | 2.69             | 11.3           |
| 2NS             | 81-019 | Pleasant Lake | 1200         | 7.26            | 2.65             | 38.7           |
| <b>Total Wt</b> |        |               | <b>3100</b>  | <b>18.58</b>    |                  | <b>100.0</b>   |

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



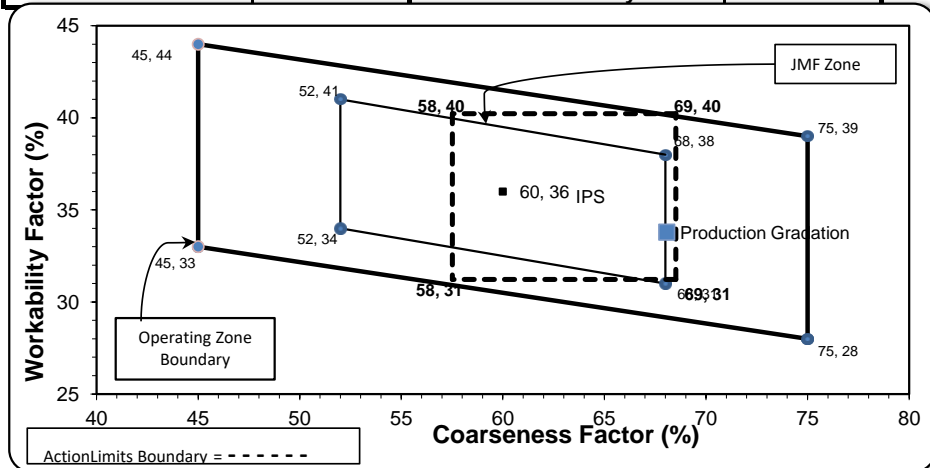
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 80.2  | 100.0 | 100.0 | 90.1                 | 9.9        | 9.9                   |
| 1/2"  | 35.4  | 98.6  | 100.0 | 67.5                 | 22.6       | 32.5                  |
| 3/8"  | 12.8  | 87.0  | 100.0 | 54.9                 | 12.6       | 45.1                  |
| #4    | 2.8   | 5.0   | 98.4  | 40.1                 | 14.9       | 59.9                  |
| #8    | 1.8   | 1.6   | 84.5  | 33.8                 | 6.3        | 66.2                  |
| #16   | 1.6   | 1.3   | 65.7  | 26.4                 | 7.4        | 73.6                  |
| #30   | 1.6   | 1.2   | 45.5  | 18.5                 | 7.8        | 81.5                  |
| #50   | 1.5   | 1.1   | 21.5  | 9.2                  | 9.4        | 90.8                  |
| #100  | 1.4   | 1.0   | 4.2   | 2.4                  | 6.8        | 97.6                  |
| LBW   | 1.0   | 0.8   | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

|                           |           |                            |           |
|---------------------------|-----------|----------------------------|-----------|
| <b>Coarseness Factor:</b> | <b>68</b> | <b>Workability Factor:</b> | <b>34</b> |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| <b>Coarseness Factor:</b>  | <b>63</b>            |            |                       |
|----------------------------|----------------------|------------|-----------------------|
| <b>Workability Factor:</b> | <b>36</b>            |            |                       |
| 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 #:** 14

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source   | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|----------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco  | 1500         | 8.94            | 2.69             | 48.2           |
| 26A             | 58-003 | Stoneco  | 400          | 2.38            | 2.69             | 12.9           |
| 2NS             | 19-04  | Schlegel | 1210         | 7.26            | 2.67             | 38.9           |
| <b>Total Wt</b> |        |          | <b>3110</b>  | <b>18.58</b>    |                  | <b>100.0</b>   |

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



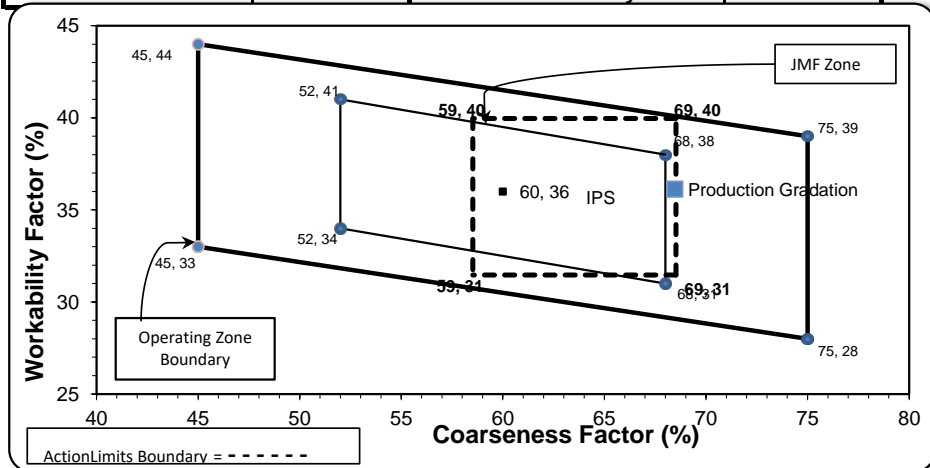
**Builders Redi-Mix**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 80.2  | 100.0 | 100.0 | 90.5                 | 9.5        | 9.5                   |
| 1/2"  | 35.4  | 98.6  | 100.0 | 68.7                 | 21.8       | 31.3                  |
| 3/8"  | 12.8  | 87.0  | 100.0 | 56.3                 | 12.4       | 43.7                  |
| #4    | 2.8   | 5.0   | 99.9  | 40.9                 | 15.4       | 59.1                  |
| #8    | 1.8   | 1.6   | 90.1  | 36.1                 | 4.7        | 63.9                  |
| #16   | 1.6   | 1.3   | 69.4  | 27.9                 | 8.2        | 72.1                  |
| #30   | 1.6   | 1.2   | 44.5  | 18.2                 | 9.7        | 81.8                  |
| #50   | 1.5   | 1.1   | 14.3  | 6.4                  | 11.8       | 93.6                  |
| #100  | 1.4   | 1.0   | 2.7   | 1.9                  | 4.6        | 98.1                  |
| LBW   | 1.0   | 0.8   | 0.2   | 0.7                  | 1.2        | 99.3                  |

\*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** 68      **Workability Factor:** 36



Intial 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 #:** 12

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle | 1550         | 9.48            | 2.62             | 50.8           |
| 26A             | 71-47  | Presque Isle | 270          | 1.65            | 2.62             | 8.9            |
| 2NS             | 63-115 | Ray Rd       | 1230         | 7.44            | 2.65             | 40.3           |
| <b>Total Wt</b> |        |              | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



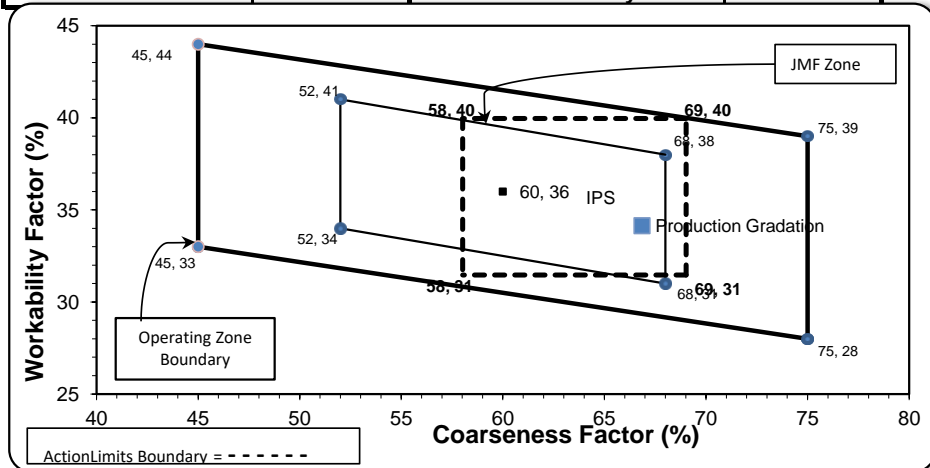
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 99.1  | 100.0 | 100.0 | 99.5                 | 0.5        | 0.5                   |
| 3/4"  | 75.6  | 100.0 | 100.0 | 87.6                 | 11.9       | 12.4                  |
| 1/2"  | 33.6  | 93.0  | 100.0 | 65.6                 | 22.0       | 34.4                  |
| 3/8"  | 16.6  | 81.5  | 100.0 | 56.0                 | 9.7        | 44.0                  |
| #4    | 2.7   | 19.2  | 96.5  | 42.0                 | 14.0       | 58.0                  |
| #8    | 2.2   | 4.6   | 80.9  | 34.2                 | 7.8        | 65.8                  |
| #16   | 2.0   | 2.4   | 65.6  | 27.7                 | 6.5        | 72.3                  |
| #30   | 1.9   | 1.9   | 48.7  | 20.8                 | 6.9        | 79.2                  |
| #50   | 1.9   | 1.8   | 24.4  | 11.0                 | 9.8        | 89.0                  |
| #100  | 1.8   | 1.7   | 5.7   | 3.4                  | 7.6        | 96.6                  |
| LBW   | 1.4   | 1.5   | 0.7   | 1.1                  | 2.2        | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

|                           |           |                            |           |
|---------------------------|-----------|----------------------------|-----------|
| <b>Coarseness Factor:</b> | <b>67</b> | <b>Workability Factor:</b> | <b>34</b> |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

|                            |           |
|----------------------------|-----------|
| <b>Coarseness Factor:</b>  | <b>64</b> |
| <b>Workability Factor:</b> | <b>36</b> |

| 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 #:** 20

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit # | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47 | Presque Isle | 1600         | 9.79            | 2.62             | 52.5           |
| 26A             | 71-47 | Presque Isle | 200          | 1.22            | 2.62             | 6.6            |
| 2NS             | 63-92 | Grange Hall  | 1250         | 7.56            | 2.65             | 41.0           |
| <b>Total Wt</b> |       |              | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



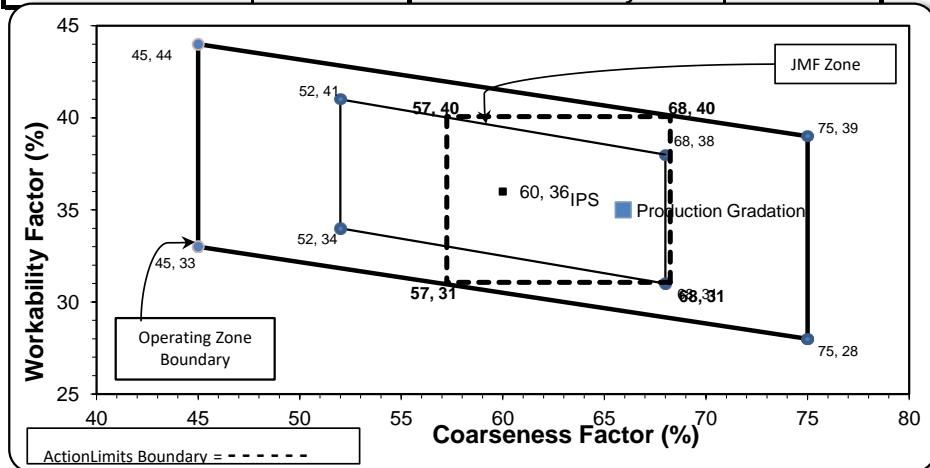
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 96.3  | 100.0 | 100.0 | 98.1                 | 1.9        | 1.9                   |
| 3/4"  | 80.1  | 100.0 | 100.0 | 89.6                 | 8.5        | 10.4                  |
| 1/2"  | 37.3  | 90.1  | 100.0 | 66.5                 | 23.1       | 33.5                  |
| 3/8"  | 21.6  | 73.8  | 100.0 | 57.2                 | 9.3        | 42.8                  |
| #4    | 2.2   | 9.9   | 97.5  | 41.8                 | 15.4       | 58.2                  |
| #8    | 1.4   | 2.0   | 83.3  | 35.0                 | 6.8        | 65.0                  |
| #16   | 1.3   | 1.1   | 69.0  | 29.0                 | 6.0        | 71.0                  |
| #30   | 1.3   | 0.9   | 50.2  | 21.3                 | 7.7        | 78.7                  |
| #50   | 1.2   | 0.8   | 19.9  | 8.8                  | 12.5       | 91.2                  |
| #100  | 1.2   | 0.8   | 2.7   | 1.8                  | 7.0        | 98.2                  |
| LBW   | 0.9   | 0.7   | 0.4   | 0.7                  | 1.1        | 99.3                  |

\*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** 66      **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"  | 93.3                 | 6.7        | 6.7                   |
| 1/2"  | 70.6                 | 22.6       | 29.4                  |
| 3/8"  | 59.6                 | 11.0       | 40.4                  |
| #4    | 43.9                 | 15.7       | 56.1                  |
| #8    | 35.6                 | 8.4        | 64.4                  |
| #16   | 28.4                 | 7.2        | 71.6                  |
| #30   | 19.4                 | 9.0        | 80.6                  |
| #50   | 7.5                  | 11.9       | 92.5                  |
| #100  | 0.9                  | 6.6        | 99.1                  |
| LBW   | 0.9                  | 0.1        | 99.1                  |

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** p11

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle | 1500         | 9.17            | 2.62             | 49.2           |
| 26A             | 71-47  | Presque Isle | 320          | 1.96            | 2.62             | 10.5           |
| 2NS             | 95-013 | Smelter Bay  | 1230         | 7.44            | 2.65             | 40.3           |
| <b>Total Wt</b> |        |              | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



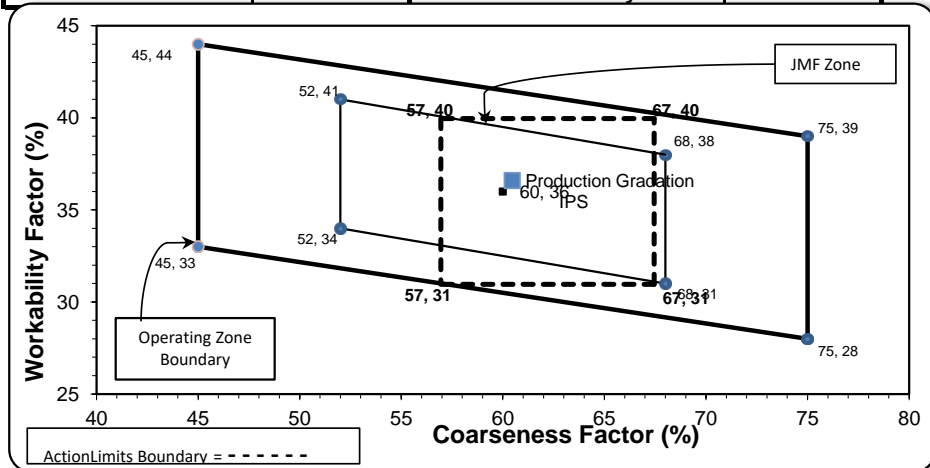
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 97.7  | 100.0 | 100.0 | 98.9                 | 1.1        | 1.1                   |
| 3/4"  | 74.5  | 100.0 | 100.0 | 87.5                 | 11.4       | 12.5                  |
| 1/2"  | 38.5  | 93.0  | 100.0 | 69.0                 | 18.4       | 31.0                  |
| 3/8"  | 26.0  | 81.5  | 100.0 | 61.7                 | 7.4        | 38.3                  |
| #4    | 6.3   | 19.2  | 96.5  | 44.0                 | 17.6       | 56.0                  |
| #8    | 3.4   | 4.6   | 85.4  | 36.6                 | 7.4        | 63.4                  |
| #16   | 3.0   | 2.4   | 71.0  | 30.4                 | 6.2        | 69.6                  |
| #30   | 2.8   | 1.9   | 50.9  | 22.1                 | 8.3        | 77.9                  |
| #50   | 2.7   | 1.8   | 24.5  | 11.4                 | 10.7       | 88.6                  |
| #100  | 2.5   | 1.7   | 7.4   | 4.4                  | 7.0        | 95.6                  |
| LBW   | 1.8   | 1.5   | 1.1   | 1.5                  | 2.9        | 98.5                  |

\*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** 60      **Workability Factor:** 37



Initial Production Sample (IPS)

| <b>Coarseness Factor:</b> <u>62</u> |                      | <b>Workability Factor:</b> <u>35</u> |                       |
|-------------------------------------|----------------------|--------------------------------------|-----------------------|
| 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-32**

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle | 1500         | 9.17            | 2.62             | 49.2           |
| 26A             | 71-47  | Presque Isle | 320          | 1.96            | 2.62             | 10.5           |
| 2NS             | 95-013 | Smelter Bay  | 1230         | 7.44            | 2.65             | 40.3           |
| <b>Total Wt</b> |        |              | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



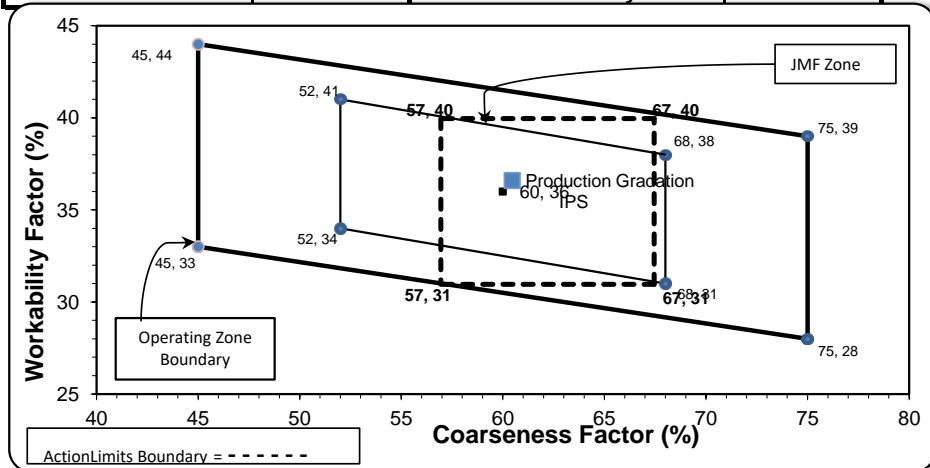
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 97.7  | 100.0 | 100.0 | 98.9                 | 1.1        | 1.1                   |
| 3/4"  | 74.5  | 100.0 | 100.0 | 87.5                 | 11.4       | 12.5                  |
| 1/2"  | 38.5  | 93.0  | 100.0 | 69.0                 | 18.4       | 31.0                  |
| 3/8"  | 26.0  | 81.5  | 100.0 | 61.7                 | 7.4        | 38.3                  |
| #4    | 6.3   | 19.2  | 96.5  | 44.0                 | 17.6       | 56.0                  |
| #8    | 3.4   | 4.6   | 85.4  | 36.6                 | 7.4        | 63.4                  |
| #16   | 3.0   | 2.4   | 71.0  | 30.4                 | 6.2        | 69.6                  |
| #30   | 2.8   | 1.9   | 50.9  | 22.1                 | 8.3        | 77.9                  |
| #50   | 2.7   | 1.8   | 24.5  | 11.4                 | 10.7       | 88.6                  |
| #100  | 2.5   | 1.7   | 7.4   | 4.4                  | 7.0        | 95.6                  |
| LBW   | 1.8   | 1.5   | 1.1   | 1.5                  | 2.9        | 98.5                  |

\*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **60**      **Workability Factor:** **37**



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-35**

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1550         | 9.23            | 2.69             | 50.0           |
| 26A             | 58-003 | Stoneco       | 350          | 2.09            | 2.69             | 11.3           |
| 2NS             | 81-019 | Pleasant Lake | 1200         | 7.26            | 2.65             | 38.7           |
| <b>Total Wt</b> |        |               | <b>3100</b>  | <b>18.58</b>    |                  | <b>100.0</b>   |

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



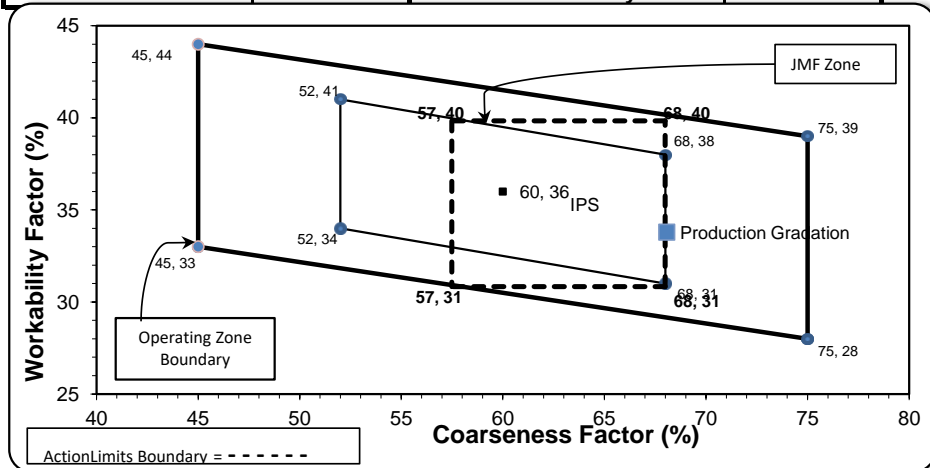
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 80.2  | 100.0 | 100.0 | 90.1                 | 9.9        | 9.9                   |
| 1/2"  | 35.4  | 98.6  | 100.0 | 67.5                 | 22.6       | 32.5                  |
| 3/8"  | 12.8  | 87.0  | 100.0 | 54.9                 | 12.6       | 45.1                  |
| #4    | 2.8   | 5.0   | 98.4  | 40.1                 | 14.9       | 59.9                  |
| #8    | 1.8   | 1.6   | 84.5  | 33.8                 | 6.3        | 66.2                  |
| #16   | 1.6   | 1.3   | 65.7  | 26.4                 | 7.4        | 73.6                  |
| #30   | 1.6   | 1.2   | 45.5  | 18.5                 | 7.8        | 81.5                  |
| #50   | 1.5   | 1.1   | 21.5  | 9.2                  | 9.4        | 90.8                  |
| #100  | 1.4   | 1.0   | 4.2   | 2.4                  | 6.8        | 97.6                  |
| LBW   | 1.0   | 0.8   | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **68**      **Workability Factor:** **34**



Intial Production Sample (IPS)

**Coarseness Factor:** **63**  
**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"    | 99.2                 | 0.8        | 0.8                   |
| 3/4"  | 90.9                 | 8.3        | 9.1                   |
| 1/2"  | 71.3                 | 19.6       | 28.7                  |
| 3/8"  | 59.4                 | 11.9       | 40.6                  |
| #4    | 43.0                 | 16.5       | 57.0                  |
| #8    | 35.3                 | 7.6        | 64.7                  |
| #16   | 28.2                 | 7.1        | 71.8                  |
| #30   | 21.6                 | 6.6        | 78.4                  |
| #50   | 9.1                  | 12.5       | 90.9                  |
| #100  | 1.7                  | 7.4        | 98.3                  |
| LBW   | 1.1                  | 0.6        | 98.9                  |

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

**PLANT #:** **P-36**

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit # | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47 | Presque Isle | 1500         | 9.17            | 2.62             | 49.2           |
| 26A             | 71-47 | Presque Isle | 350          | 2.14            | 2.62             | 11.5           |
| 2NS             | 63-92 | Grange Hall  | 1200         | 7.26            | 2.65             | 39.3           |
| <b>Total Wt</b> |       |              | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



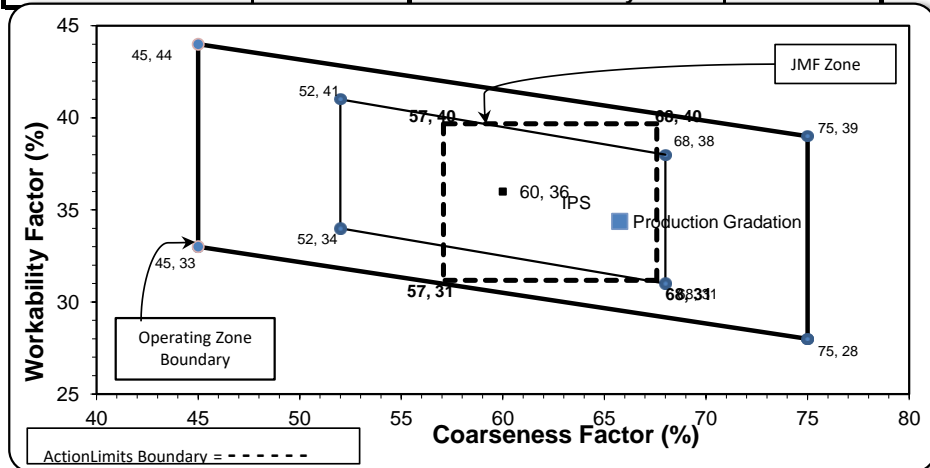
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 99.1  | 100.0 | 100.0 | 99.6                 | 0.4        | 0.4                   |
| 3/4"  | 75.6  | 100.0 | 100.0 | 88.0                 | 11.6       | 12.0                  |
| 1/2"  | 33.6  | 93.0  | 100.0 | 66.5                 | 21.5       | 33.5                  |
| 3/8"  | 16.6  | 81.5  | 100.0 | 56.9                 | 9.7        | 43.1                  |
| #4    | 2.7   | 19.2  | 97.5  | 41.9                 | 15.0       | 58.1                  |
| #8    | 2.2   | 4.6   | 83.3  | 34.4                 | 7.5        | 65.6                  |
| #16   | 2.0   | 2.4   | 69.0  | 28.4                 | 6.0        | 71.6                  |
| #30   | 1.9   | 1.9   | 50.2  | 20.9                 | 7.5        | 79.1                  |
| #50   | 1.9   | 1.8   | 19.9  | 9.0                  | 11.9       | 91.0                  |
| #100  | 1.8   | 1.7   | 2.7   | 2.1                  | 6.8        | 97.9                  |
| LBW   | 1.4   | 1.5   | 0.4   | 1.0                  | 1.1        | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **66**      **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"    | 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-38**

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1550         | 9.23            | 2.69             | 50.0           |
| 26A             | 58-003 | Stoneco       | 350          | 2.09            | 2.69             | 11.3           |
| 2NS             | 81-019 | Pleasant Lake | 1200         | 7.26            | 2.65             | 38.7           |
| <b>Total Wt</b> |        |               | <b>3100</b>  | <b>18.58</b>    |                  | <b>100.0</b>   |

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



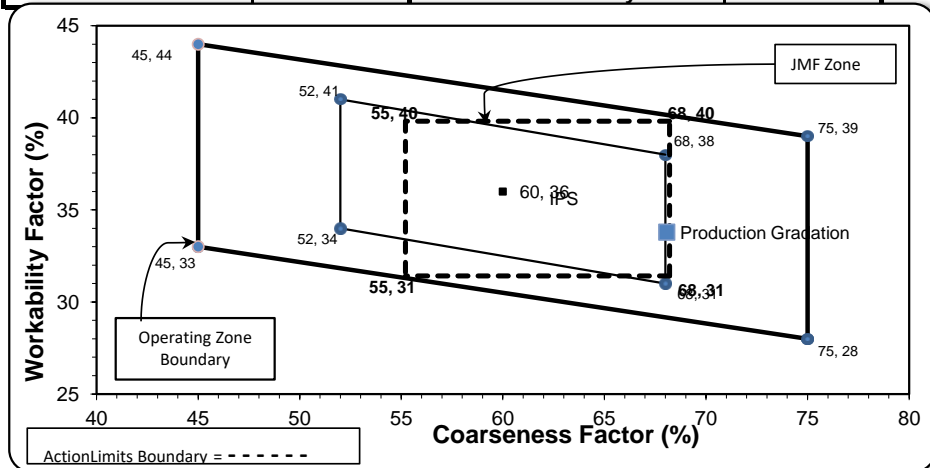
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 80.2  | 100.0 | 100.0 | 90.1                 | 9.9        | 9.9                   |
| 1/2"  | 35.4  | 98.6  | 100.0 | 67.5                 | 22.6       | 32.5                  |
| 3/8"  | 12.8  | 87.0  | 100.0 | 54.9                 | 12.6       | 45.1                  |
| #4    | 2.8   | 5.0   | 98.4  | 40.1                 | 14.9       | 59.9                  |
| #8    | 1.8   | 1.6   | 84.5  | 33.8                 | 6.3        | 66.2                  |
| #16   | 1.6   | 1.3   | 65.7  | 26.4                 | 7.4        | 73.6                  |
| #30   | 1.6   | 1.2   | 45.5  | 18.5                 | 7.8        | 81.5                  |
| #50   | 1.5   | 1.1   | 21.5  | 9.2                  | 9.4        | 90.8                  |
| #100  | 1.4   | 1.0   | 4.2   | 2.4                  | 6.8        | 97.6                  |
| LBW   | 1.0   | 0.8   | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **68**      **Workability Factor:** **34**



Initial Production Sample (IPS)

**Coarseness Factor:** **62**  
**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"  | 91.1                 | 8.1        | 8.9                   |
| 1/2"  | 72.0                 | 19.1       | 28.0                  |
| 3/8"  | 60.3                 | 11.7       | 39.7                  |
| #4    | 43.4                 | 16.9       | 56.6                  |
| #8    | 35.6                 | 7.8        | 64.4                  |
| #16   | 28.4                 | 7.2        | 71.6                  |
| #30   | 21.8                 | 6.7        | 78.2                  |
| #50   | 9.1                  | 12.6       | 90.9                  |
| #100  | 1.7                  | 7.4        | 98.3                  |
| LBW   | 1.1                  | 0.6        | 98.9                  |

PREPARED BY:  
 SM, LLC Technical Service

Approved By:

# Aggregate Optimization Chart

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

Sample Date: 10/2/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source          | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|-----------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle    | 1500         | 9.17            | 2.62             | 49.2           |
| 26A             | 71-47  | Presque Isle    | 300          | 1.83            | 2.62             | 9.8            |
| 2NS             | 44-051 | Krake Willis Rd | 1250         | 7.56            | 2.65             | 41.0           |
| <b>Total Wt</b> |        |                 | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



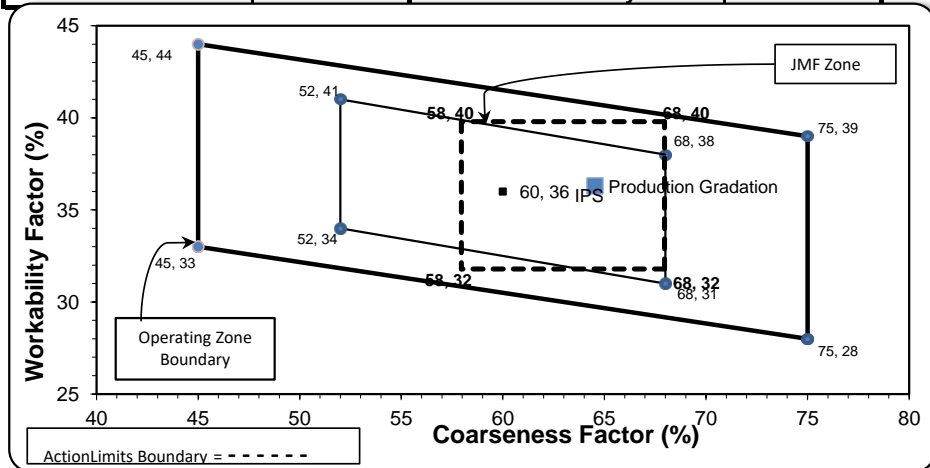
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 98.5  | 100.0 | 100.0 | 99.3                 | 0.7        | 0.7                   |
| 3/4"  | 79.4  | 100.0 | 100.0 | 89.9                 | 9.4        | 10.1                  |
| 1/2"  | 36.1  | 94.6  | 100.0 | 68.0                 | 21.8       | 32.0                  |
| 3/8"  | 19.6  | 84.1  | 100.0 | 58.9                 | 9.1        | 41.1                  |
| #4    | 3.4   | 20.2  | 98.9  | 44.2                 | 14.7       | 55.8                  |
| #8    | 2.4   | 4.6   | 84.6  | 36.3                 | 7.9        | 63.7                  |
| #16   | 2.2   | 2.3   | 68.9  | 29.5                 | 6.8        | 70.5                  |
| #30   | 2.1   | 1.8   | 49.7  | 21.6                 | 8.0        | 78.4                  |
| #50   | 2.0   | 1.7   | 23.8  | 10.9                 | 10.7       | 89.1                  |
| #100  | 1.9   | 1.6   | 6.5   | 3.8                  | 7.1        | 96.2                  |
| LBW   | 1.6   | 1.4   | 1.6   | 1.6                  | 2.2        | 98.4                  |

\*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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

|                           |           |                            |           |
|---------------------------|-----------|----------------------------|-----------|
| <b>Coarseness Factor:</b> | <b>65</b> | <b>Workability Factor:</b> | <b>36</b> |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| <b>Coarseness Factor:</b>  | <b>63</b>            |            |                       |
|----------------------------|----------------------|------------|-----------------------|
| <b>Workability Factor:</b> | <b>36</b>            |            |                       |
| 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: 10/2/23 Concrete Grade: **S2M, 3500HP**  
 Dates Test Represents: 10/3/2023 through 10/9/2023

Contractor: \_\_\_\_\_

MDOT No.: \_\_\_\_\_

| Agg. Class      | Pit #  | Source       | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle | 1550         | 9.48            | 2.62             | 50.8           |
| 26A             | 71-47  | Presque Isle | 270          | 1.65            | 2.62             | 8.9            |
| 2NS             | 63-115 | Ray Rd       | 1230         | 7.44            | 2.65             | 40.3           |
| <b>Total Wt</b> |        |              | <b>3050</b>  | <b>18.57</b>    |                  | <b>100.0</b>   |

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



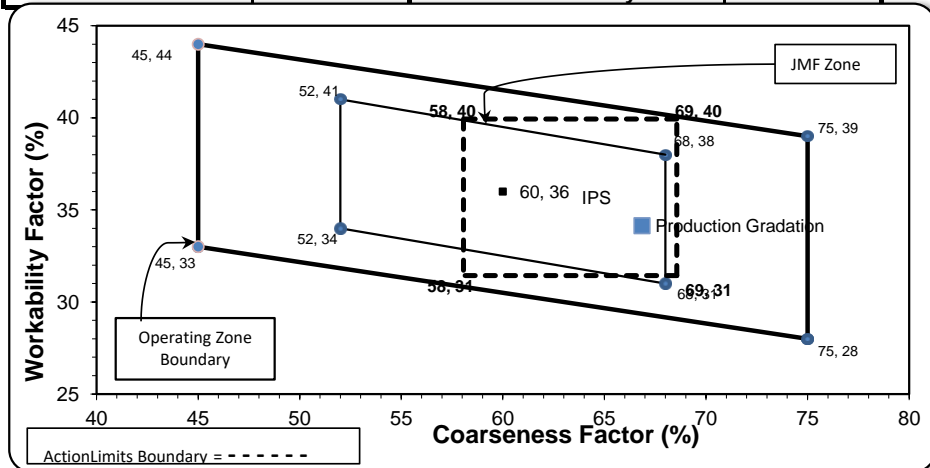
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 99.1  | 100.0 | 100.0 | 99.5                 | 0.5        | 0.5                   |
| 3/4"  | 75.6  | 100.0 | 100.0 | 87.6                 | 11.9       | 12.4                  |
| 1/2"  | 33.6  | 93.0  | 100.0 | 65.6                 | 22.0       | 34.4                  |
| 3/8"  | 16.6  | 81.5  | 100.0 | 56.0                 | 9.7        | 44.0                  |
| #4    | 2.7   | 19.2  | 96.5  | 42.0                 | 14.0       | 58.0                  |
| #8    | 2.2   | 4.6   | 80.9  | 34.2                 | 7.8        | 65.8                  |
| #16   | 2.0   | 2.4   | 65.6  | 27.7                 | 6.5        | 72.3                  |
| #30   | 1.9   | 1.9   | 48.7  | 20.8                 | 6.9        | 79.2                  |
| #50   | 1.9   | 1.8   | 24.4  | 11.0                 | 9.8        | 89.0                  |
| #100  | 1.8   | 1.7   | 5.7   | 3.4                  | 7.6        | 96.6                  |
| LBW   | 1.4   | 1.5   | 0.7   | 1.1                  | 2.2        | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **67** **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: