

# Aggregate Optimization Chart

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

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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"    | 98.1  | 100.0 | 100.0 | 99.1                 | 0.9        | 0.9                   |
| 3/4"  | 74.4  | 100.0 | 100.0 | 87.2                 | 11.8       | 12.8                  |
| 1/2"  | 31.5  | 95.5  | 100.0 | 65.4                 | 21.9       | 34.6                  |
| 3/8"  | 15.3  | 85.5  | 100.0 | 56.3                 | 9.1        | 43.7                  |
| #4    | 3.0   | 18.7  | 98.0  | 42.8                 | 13.5       | 57.2                  |
| #8    | 1.8   | 4.1   | 83.5  | 34.9                 | 7.9        | 65.1                  |
| #16   | 1.6   | 2.5   | 68.7  | 28.7                 | 6.2        | 71.3                  |
| #30   | 1.6   | 2.2   | 52.5  | 22.2                 | 6.6        | 77.8                  |
| #50   | 1.5   | 2.0   | 26.8  | 11.7                 | 10.4       | 88.3                  |
| #100  | 1.5   | 1.9   | 8.0   | 4.2                  | 7.6        | 95.8                  |
| LBW   | 1.3   | 1.8   | 1.2   | 1.3                  | 2.8        | 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

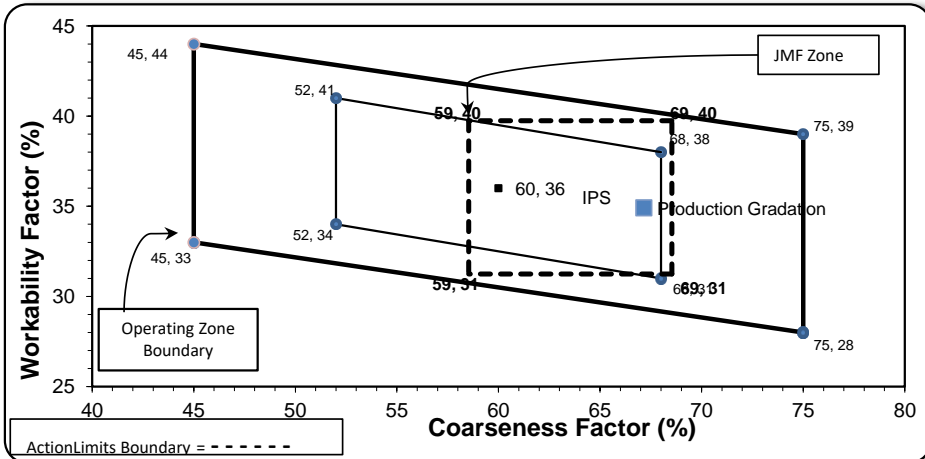
**Coarseness Factor:** **67**      **Workability Factor:** **35**

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: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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

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

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1600         | 9.53            | 2.69             | 51.6           |
| 26A             | 58-003 | Stoneco       | 300          | 1.79            | 2.69             | 9.7            |
| 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%



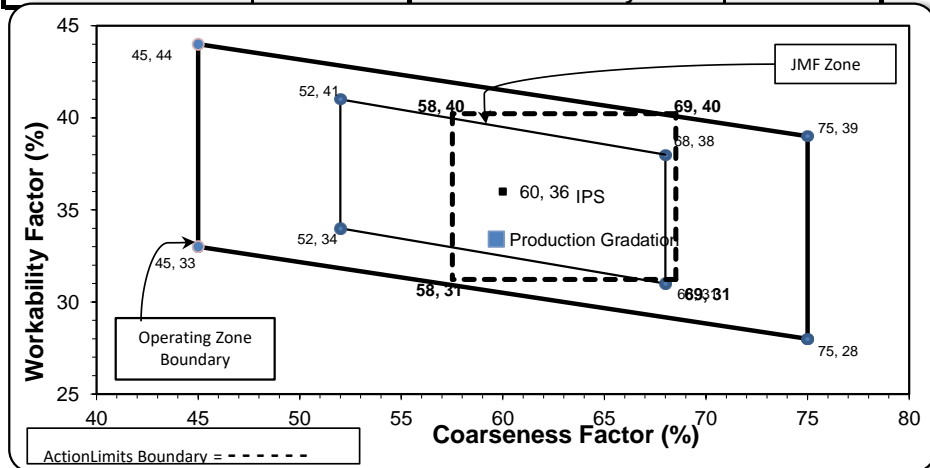
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 85.5  | 100.0 | 100.0 | 92.5                 | 7.5        | 7.5                   |
| 1/2"  | 47.3  | 99.5  | 100.0 | 72.8                 | 19.8       | 27.2                  |
| 3/8"  | 25.0  | 89.4  | 100.0 | 60.3                 | 12.5       | 39.7                  |
| #4    | 4.1   | 11.5  | 96.8  | 40.7                 | 19.6       | 59.3                  |
| #8    | 2.2   | 3.9   | 82.4  | 33.4                 | 7.3        | 66.6                  |
| #16   | 1.2   | 2.6   | 66.4  | 26.6                 | 6.8        | 73.4                  |
| #30   | 1.1   | 2.3   | 48.8  | 19.7                 | 6.9        | 80.3                  |
| #50   | 1.0   | 2.0   | 23.5  | 9.8                  | 9.9        | 90.2                  |
| #100  | 0.9   | 1.9   | 6.5   | 3.2                  | 6.6        | 96.8                  |
| LBW   | 0.8   | 1.8   | 1.3   | 1.1                  | 2.1        | 98.9                  |

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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

|                           |           |                            |           |
|---------------------------|-----------|----------------------------|-----------|
| <b>Coarseness Factor:</b> | <b>60</b> | <b>Workability Factor:</b> | <b>33</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

# Production Gradation Report

**PLANT #:** **P-103**

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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

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

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1600         | 9.53            | 2.69             | 51.6           |
| 26A             | 58-003 | Stoneco       | 300          | 1.79            | 2.69             | 9.7            |
| 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%



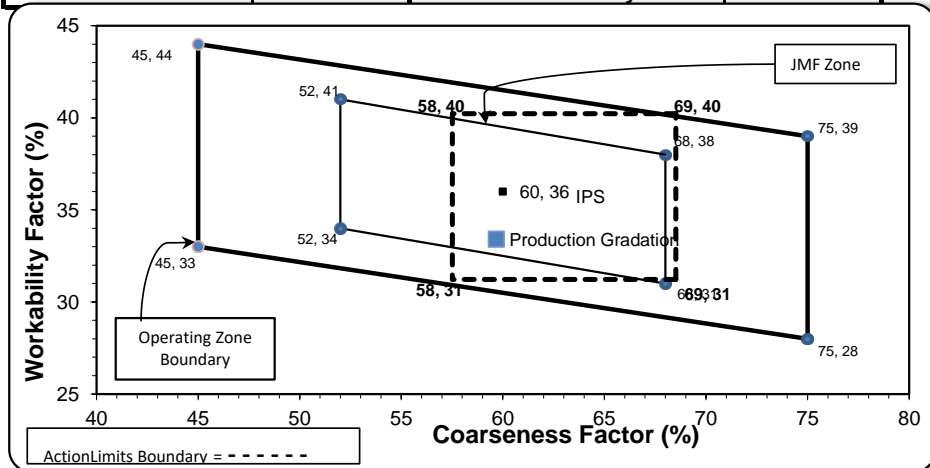
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 85.5  | 100.0 | 100.0 | 92.5                 | 7.5        | 7.5                   |
| 1/2"  | 47.3  | 99.5  | 100.0 | 72.8                 | 19.8       | 27.2                  |
| 3/8"  | 25.0  | 89.4  | 100.0 | 60.3                 | 12.5       | 39.7                  |
| #4    | 4.1   | 11.5  | 96.8  | 40.7                 | 19.6       | 59.3                  |
| #8    | 2.2   | 3.9   | 82.4  | 33.4                 | 7.3        | 66.6                  |
| #16   | 1.2   | 2.6   | 66.4  | 26.6                 | 6.8        | 73.4                  |
| #30   | 1.1   | 2.3   | 48.8  | 19.7                 | 6.9        | 80.3                  |
| #50   | 1.0   | 2.0   | 23.5  | 9.8                  | 9.9        | 90.2                  |
| #100  | 0.9   | 1.9   | 6.5   | 3.2                  | 6.6        | 96.8                  |
| LBW   | 0.8   | 1.8   | 1.3   | 1.1                  | 2.1        | 98.9                  |

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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **60**      **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 #:** 14

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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

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

| Agg. Class      | Pit #  | Source   | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|----------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco  | 1600         | 9.53            | 2.69             | 51.4           |
| 26A             | 58-003 | Stoneco  | 300          | 1.79            | 2.69             | 9.6            |
| 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%



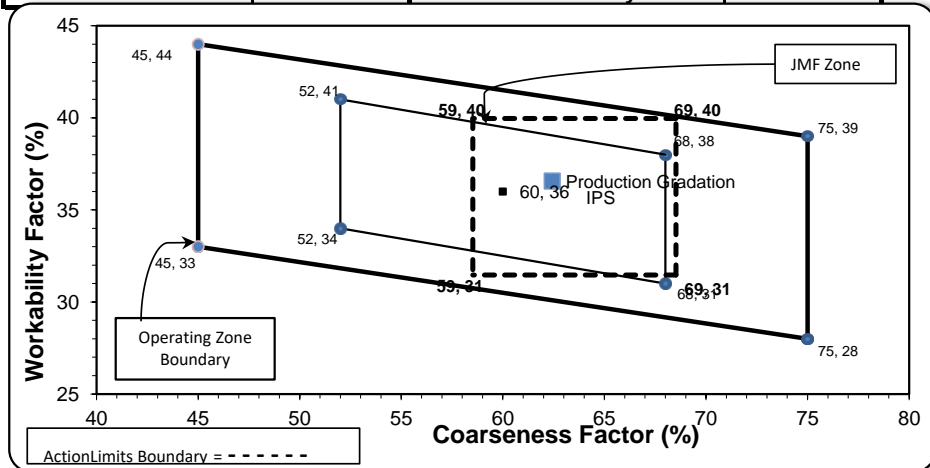
**Builders Redi-Mix**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 85.5  | 100.0 | 100.0 | 92.5                 | 7.5        | 7.5                   |
| 1/2"  | 47.3  | 99.5  | 100.0 | 72.8                 | 19.7       | 27.2                  |
| 3/8"  | 25.0  | 89.4  | 100.0 | 60.4                 | 12.4       | 39.6                  |
| #4    | 4.1   | 11.5  | 99.9  | 42.1                 | 18.3       | 57.9                  |
| #8    | 2.2   | 3.9   | 90.1  | 36.6                 | 5.5        | 63.4                  |
| #16   | 1.2   | 2.6   | 69.4  | 27.9                 | 8.7        | 72.1                  |
| #30   | 1.1   | 2.3   | 44.5  | 18.1                 | 9.8        | 81.9                  |
| #50   | 1.0   | 2.0   | 14.3  | 6.3                  | 11.8       | 93.7                  |
| #100  | 0.9   | 1.9   | 2.7   | 1.7                  | 4.6        | 98.3                  |
| LBW   | 0.8   | 1.8   | 0.2   | 0.7                  | 1.0        | 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 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

|                           |           |                            |           |
|---------------------------|-----------|----------------------------|-----------|
| <b>Coarseness Factor:</b> | <b>62</b> | <b>Workability Factor:</b> | <b>37</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 #:** 12

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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 | 220          | 1.35            | 2.62             | 7.2            |
| 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%



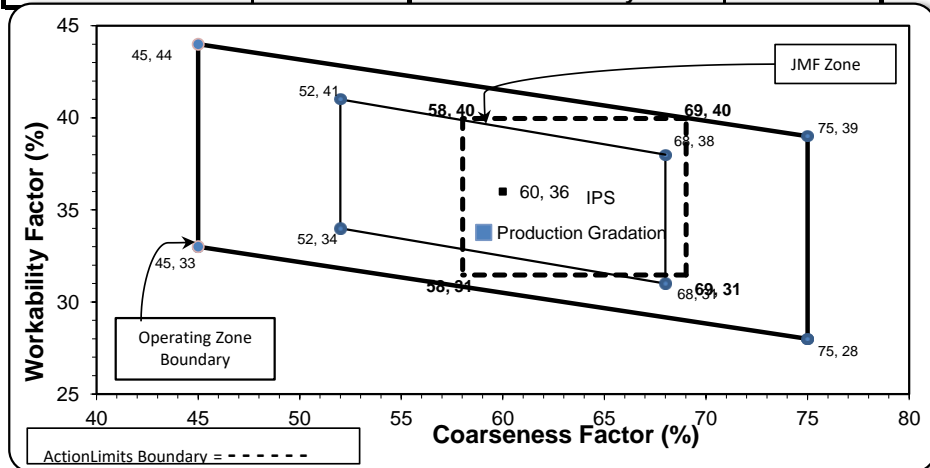
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 100.0 | 100.0 | 100.0 | 100.0                | 0.0        | 0.0                   |
| 3/4"  | 90.0  | 100.0 | 100.0 | 94.8                 | 5.2        | 5.2                   |
| 1/2"  | 47.6  | 95.3  | 100.0 | 72.2                 | 22.6       | 27.8                  |
| 3/8"  | 27.6  | 84.4  | 100.0 | 60.9                 | 11.3       | 39.1                  |
| #4    | 2.9   | 17.3  | 97.0  | 41.9                 | 19.0       | 58.1                  |
| #8    | 1.4   | 4.7   | 81.1  | 33.8                 | 8.1        | 66.2                  |
| #16   | 1.2   | 2.4   | 65.8  | 27.3                 | 6.4        | 72.7                  |
| #30   | 1.2   | 1.9   | 49.8  | 20.8                 | 6.5        | 79.2                  |
| #50   | 1.2   | 1.8   | 25.8  | 11.2                 | 9.7        | 88.8                  |
| #100  | 1.1   | 1.7   | 3.2   | 2.0                  | 9.2        | 98.0                  |
| LBW   | 1.0   | 1.5   | 0.5   | 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:** 59      **Workability Factor:** 34



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 #:** p11

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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%

| 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"  | 83.1  | 100.0 | 100.0 | 91.7                 | 8.3        | 8.3                   |
| 1/2"  | 31.2  | 95.3  | 100.0 | 65.7                 | 26.0       | 34.3                  |
| 3/8"  | 15.9  | 84.4  | 100.0 | 57.0                 | 8.7        | 43.0                  |
| #4    | 2.9   | 17.3  | 96.2  | 42.0                 | 15.0       | 58.0                  |
| #8    | 1.9   | 4.7   | 84.5  | 35.5                 | 6.5        | 64.5                  |
| #16   | 1.5   | 2.4   | 69.2  | 28.9                 | 6.6        | 71.1                  |
| #30   | 1.5   | 1.9   | 50.4  | 21.3                 | 7.6        | 78.7                  |
| #50   | 1.4   | 1.8   | 24.8  | 10.9                 | 10.4       | 89.1                  |
| #100  | 1.4   | 1.7   | 6.8   | 3.6                  | 7.3        | 96.4                  |
| LBW   | 1.2   | 1.5   | 1.1   | 1.2                  | 2.4        | 98.8                  |

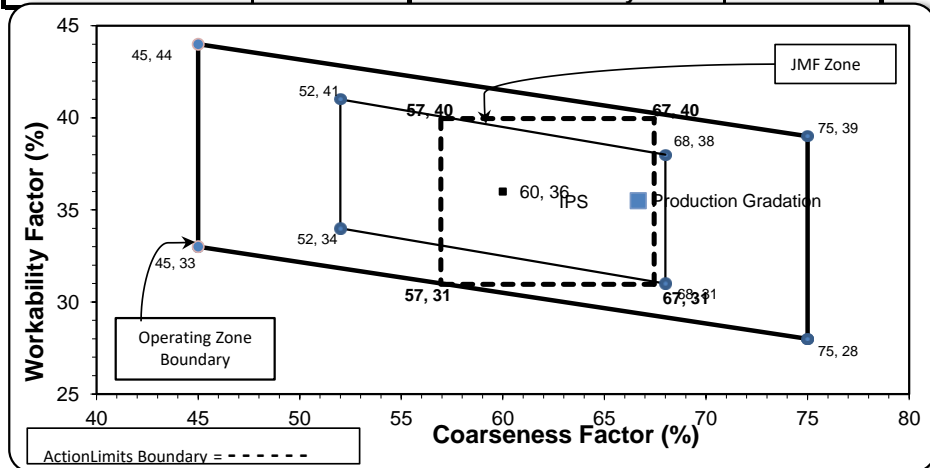


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 Suite 500  
 Farmington Hills, MI 48336

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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** 67      **Workability Factor:** 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-32**

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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%



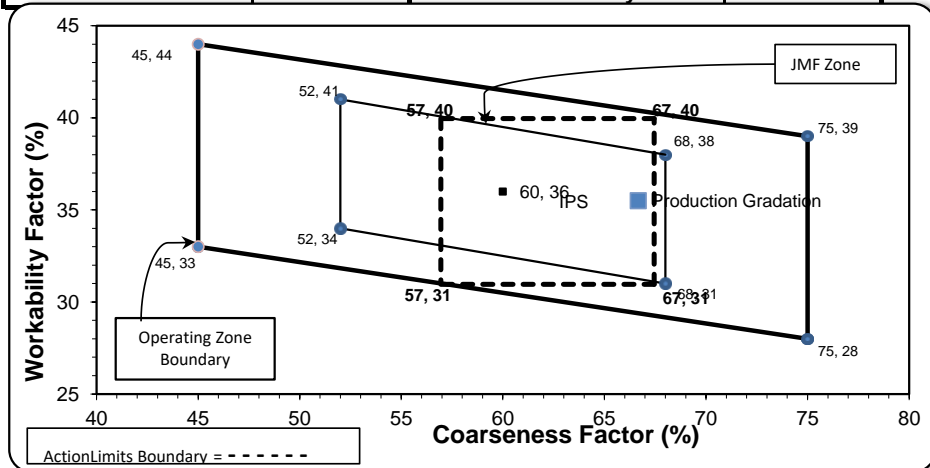
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 100.0 | 100.0 | 100.0 | 100.0                | 0.0        | 0.0                   |
| 3/4"  | 83.1  | 100.0 | 100.0 | 91.7                 | 8.3        | 8.3                   |
| 1/2"  | 31.2  | 95.3  | 100.0 | 65.7                 | 26.0       | 34.3                  |
| 3/8"  | 15.9  | 84.4  | 100.0 | 57.0                 | 8.7        | 43.0                  |
| #4    | 2.9   | 17.3  | 96.2  | 42.0                 | 15.0       | 58.0                  |
| #8    | 1.9   | 4.7   | 84.5  | 35.5                 | 6.5        | 64.5                  |
| #16   | 1.5   | 2.4   | 69.2  | 28.9                 | 6.6        | 71.1                  |
| #30   | 1.5   | 1.9   | 50.4  | 21.3                 | 7.6        | 78.7                  |
| #50   | 1.4   | 1.8   | 24.8  | 10.9                 | 10.4       | 89.1                  |
| #100  | 1.4   | 1.7   | 6.8   | 3.6                  | 7.3        | 96.4                  |
| LBW   | 1.2   | 1.5   | 1.1   | 1.2                  | 2.4        | 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:** **67**      **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-35**

Sample Date: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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

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

| Agg. Class      | Pit #  | Source        | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA             | 58-003 | Stoneco       | 1600         | 9.53            | 2.69             | 51.6           |
| 26A             | 58-003 | Stoneco       | 300          | 1.79            | 2.69             | 9.7            |
| 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%



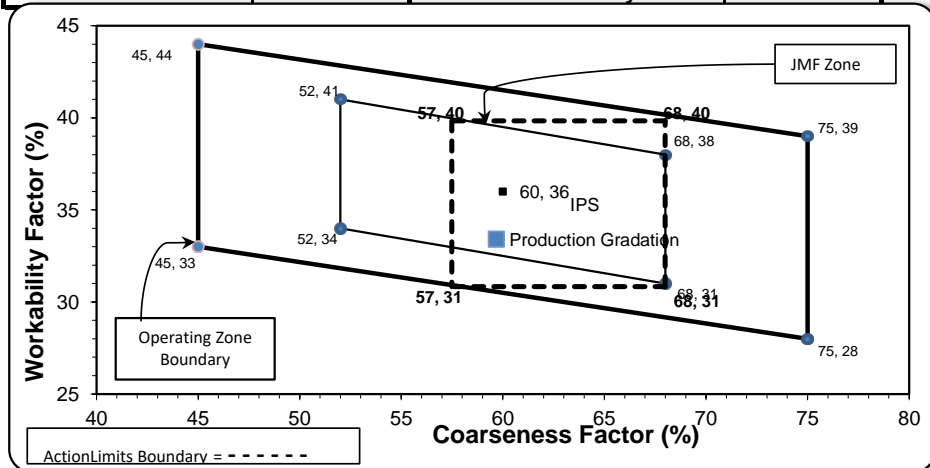
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"  | 85.5  | 100.0 | 100.0 | 92.5                 | 7.5        | 7.5                   |
| 1/2"  | 47.3  | 99.5  | 100.0 | 72.8                 | 19.8       | 27.2                  |
| 3/8"  | 25.0  | 89.4  | 100.0 | 60.3                 | 12.5       | 39.7                  |
| #4    | 4.1   | 11.5  | 96.8  | 40.7                 | 19.6       | 59.3                  |
| #8    | 2.2   | 3.9   | 82.4  | 33.4                 | 7.3        | 66.6                  |
| #16   | 1.2   | 2.6   | 66.4  | 26.6                 | 6.8        | 73.4                  |
| #30   | 1.1   | 2.3   | 48.8  | 19.7                 | 6.9        | 80.3                  |
| #50   | 1.0   | 2.0   | 23.5  | 9.8                  | 9.9        | 90.2                  |
| #100  | 0.9   | 1.9   | 6.5   | 3.2                  | 6.6        | 96.8                  |
| LBW   | 0.8   | 1.8   | 1.3   | 1.1                  | 2.1        | 98.9                  |

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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **60**      **Workability Factor:** **33**



Initial 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: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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%



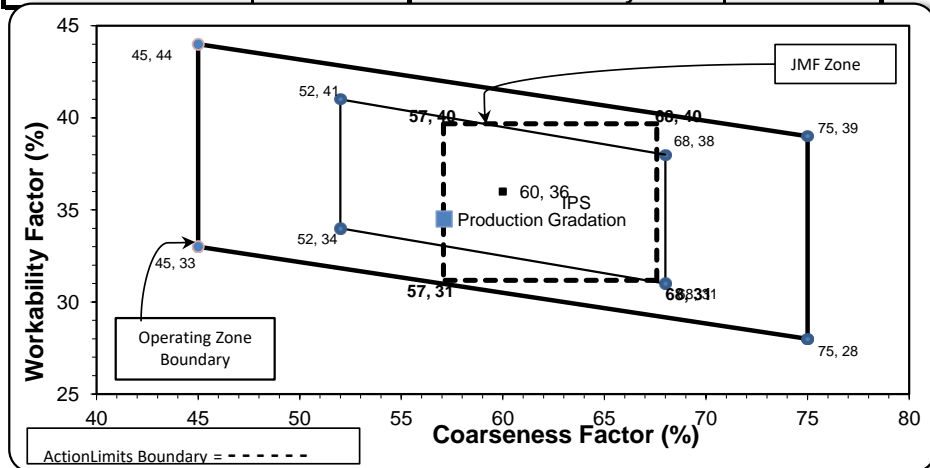
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 100.0 | 100.0 | 100.0 | 100.0                | 0.0        | 0.0                   |
| 3/4"  | 90.0  | 100.0 | 100.0 | 95.1                 | 4.9        | 4.9                   |
| 1/2"  | 47.6  | 95.3  | 100.0 | 73.7                 | 21.4       | 26.3                  |
| 3/8"  | 27.6  | 84.4  | 100.0 | 62.6                 | 11.1       | 37.4                  |
| #4    | 2.9   | 17.3  | 97.2  | 41.7                 | 20.9       | 58.3                  |
| #8    | 1.4   | 4.7   | 84.6  | 34.5                 | 7.1        | 65.5                  |
| #16   | 1.2   | 2.4   | 69.9  | 28.4                 | 6.1        | 71.6                  |
| #30   | 1.2   | 1.9   | 50.2  | 20.6                 | 7.8        | 79.4                  |
| #50   | 1.2   | 1.8   | 19.5  | 8.5                  | 12.1       | 91.5                  |
| #100  | 1.1   | 1.7   | 3.0   | 1.9                  | 6.6        | 98.1                  |
| LBW   | 1.0   | 1.5   | 0.5   | 0.9                  | 1.1        | 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

|                           |           |                            |           |
|---------------------------|-----------|----------------------------|-----------|
| <b>Coarseness Factor:</b> | <b>57</b> | <b>Workability Factor:</b> | <b>35</b> |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

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

| 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: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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

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

| Agg. Class      | Pit #  | Source          | Weight (SSD) | ft <sup>3</sup> | Specific Gravity | % Contribution |
|-----------------|--------|-----------------|--------------|-----------------|------------------|----------------|
| 6AA             | 71-47  | Presque Isle    | 1520         | 9.30            | 2.62             | 49.8           |
| 26A             | 71-47  | Presque Isle    | 280          | 1.71            | 2.62             | 9.2            |
| 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%



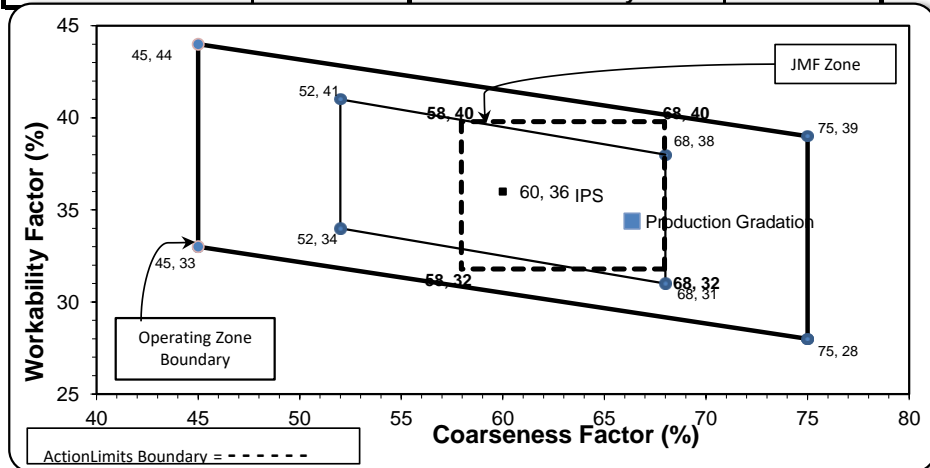
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 98.1  | 100.0 | 100.0 | 99.1                 | 0.9        | 0.9                   |
| 3/4"  | 74.4  | 100.0 | 100.0 | 87.2                 | 11.8       | 12.8                  |
| 1/2"  | 31.5  | 95.5  | 100.0 | 65.4                 | 21.8       | 34.6                  |
| 3/8"  | 15.3  | 85.5  | 100.0 | 56.5                 | 9.0        | 43.5                  |
| #4    | 3.0   | 18.7  | 95.3  | 42.3                 | 14.2       | 57.7                  |
| #8    | 1.8   | 4.1   | 80.8  | 34.4                 | 7.9        | 65.6                  |
| #16   | 1.6   | 2.5   | 64.9  | 27.6                 | 6.8        | 72.4                  |
| #30   | 1.6   | 2.2   | 49.7  | 21.4                 | 6.3        | 78.6                  |
| #50   | 1.5   | 2.0   | 24.1  | 10.8                 | 10.6       | 89.2                  |
| #100  | 1.5   | 1.9   | 7.2   | 3.9                  | 6.9        | 96.1                  |
| LBW   | 1.3   | 1.8   | 0.7   | 1.1                  | 2.8        | 98.9                  |

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

Production Gradation  Batch Plant Gradations  Aggregate Supplier Gradations

**Coarseness Factor:** **66**      **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: 4/17/23

Concrete Grade: **S2M, 3500HP**

Dates Test Represents: 4/18/2023 through 4/24/2023

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 | 220          | 1.35            | 2.62             | 7.2            |
| 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%



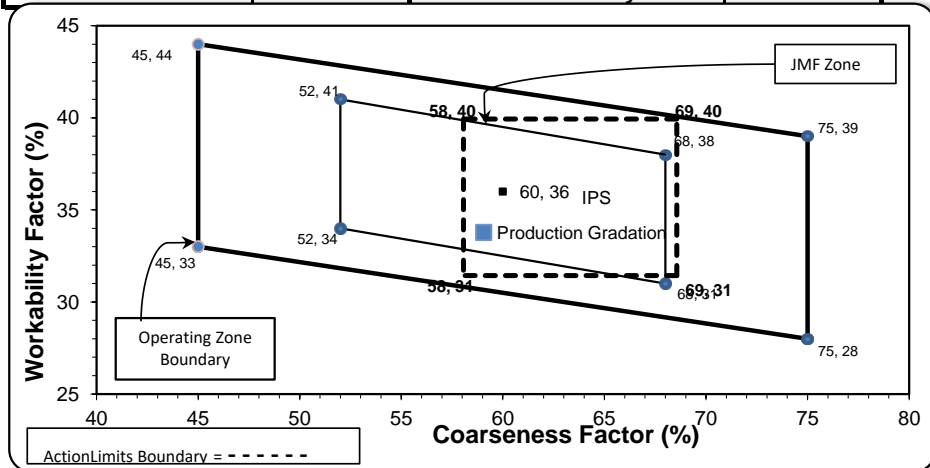
**Superior Materials, LLC**  
 30701 W. 10 Mile Rd.  
 Suite 500  
 Farmington Hills, MI 48336

| 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"    | 100.0 | 100.0 | 100.0 | 100.0                | 0.0        | 0.0                   |
| 3/4"  | 90.0  | 100.0 | 100.0 | 94.8                 | 5.2        | 5.2                   |
| 1/2"  | 47.6  | 95.3  | 100.0 | 72.2                 | 22.6       | 27.8                  |
| 3/8"  | 27.6  | 84.4  | 100.0 | 60.9                 | 11.3       | 39.1                  |
| #4    | 2.9   | 17.3  | 97.0  | 41.9                 | 19.0       | 58.1                  |
| #8    | 1.4   | 4.7   | 81.1  | 33.8                 | 8.1        | 66.2                  |
| #16   | 1.2   | 2.4   | 65.8  | 27.3                 | 6.4        | 72.7                  |
| #30   | 1.2   | 1.9   | 49.8  | 20.8                 | 6.5        | 79.2                  |
| #50   | 1.2   | 1.8   | 25.8  | 11.2                 | 9.7        | 88.8                  |
| #100  | 1.1   | 1.7   | 3.2   | 2.0                  | 9.2        | 98.0                  |
| LBW   | 1.0   | 1.5   | 0.5   | 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:** **59**      **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:  
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