

Aggregate Optimization Chart

PLANT #: **P-101**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 1070 | 6.54 | 2.62 | 34.9 |
| IA | 71-47 | Presque Isle | 800 | 4.89 | 2.62 | 26.1 |
| 2NS | 75-051 | Mid Michigan | 1200 | 7.23 | 2.66 | 39.1 |
| Total Wt | | | 3070 | 18.67 | | 100.0 |

<---- Verify this number is 100%



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

| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 98.7 | 100.0 | 100.0 | 99.5 | 0.5 | 0.5 |
| 1" | 47.5 | 100.0 | 100.0 | 81.7 | 17.8 | 18.3 |
| 3/4" | 12.4 | 98.5 | 100.0 | 69.1 | 12.6 | 30.9 |
| 1/2" | 3.0 | 83.2 | 100.0 | 61.8 | 7.3 | 38.2 |
| 3/8" | 2.0 | 63.7 | 100.0 | 56.4 | 5.4 | 43.6 |
| #4 | 1.6 | 17.3 | 98.5 | 43.6 | 12.8 | 56.4 |
| #8 | 1.4 | 4.5 | 83.1 | 34.1 | 9.4 | 65.9 |
| #16 | 1.4 | 2.7 | 66.3 | 27.1 | 7.0 | 72.9 |
| #30 | 1.3 | 2.3 | 47.5 | 19.6 | 7.5 | 80.4 |
| #50 | 1.2 | 2.1 | 20.7 | 9.1 | 10.6 | 90.9 |
| #100 | 1.1 | 1.9 | 4.8 | 2.8 | 6.3 | 97.2 |
| LBW | 0.9 | 1.7 | 0.8 | 1.1 | 1.7 | 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.

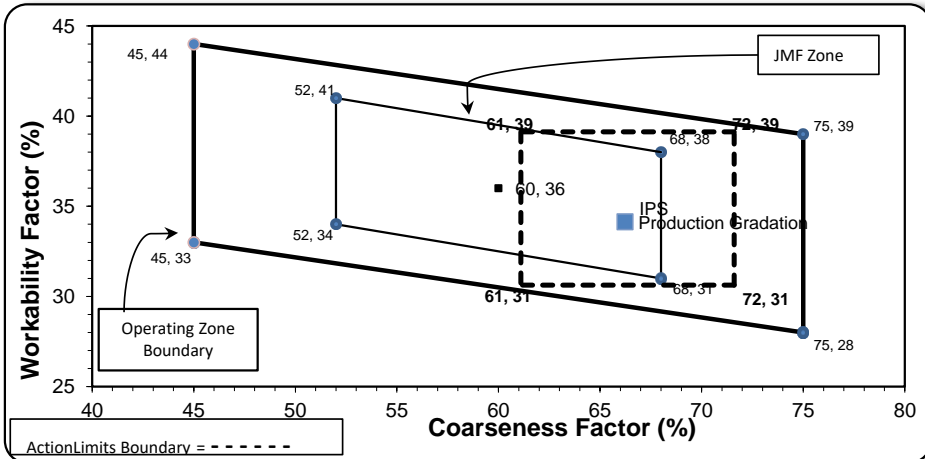
Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

| | | | |
|---------------------------|-----------|----------------------------|-----------|
| Coarseness Factor: | 66 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|

Initial Production Sample (IPS)

| | |
|----------------------------|-----------|
| Coarseness Factor: | 66 |
| Workability Factor: | 35 |

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.6 | 0.4 | 0.4 |
| 1" | 84.3 | 15.3 | 15.7 |
| 3/4" | 74.8 | 9.6 | 25.2 |
| 1/2" | 64.3 | 10.4 | 35.7 |
| 3/8" | 56.8 | 7.5 | 43.2 |
| #4 | 43.0 | 13.8 | 57.0 |
| #8 | 34.9 | 8.1 | 65.1 |
| #16 | 26.4 | 8.5 | 73.6 |
| #30 | 19.9 | 6.5 | 80.1 |
| #50 | 10.4 | 9.5 | 89.6 |
| #100 | 3.4 | 7.0 | 96.6 |
| LBW | 1.2 | 2.2 | 98.8 |



PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| CA | 58-003 | Stoneco | 1370 | 8.16 | 2.69 | 43.9 |
| IA | 58-003 | Stoneco | 550 | 3.28 | 2.69 | 17.6 |
| 2NS | 81-019 | Pleasant Lake | 1200 | 7.26 | 2.65 | 38.5 |
| Total Wt | | | 3120 | 18.70 | | 100.0 |

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



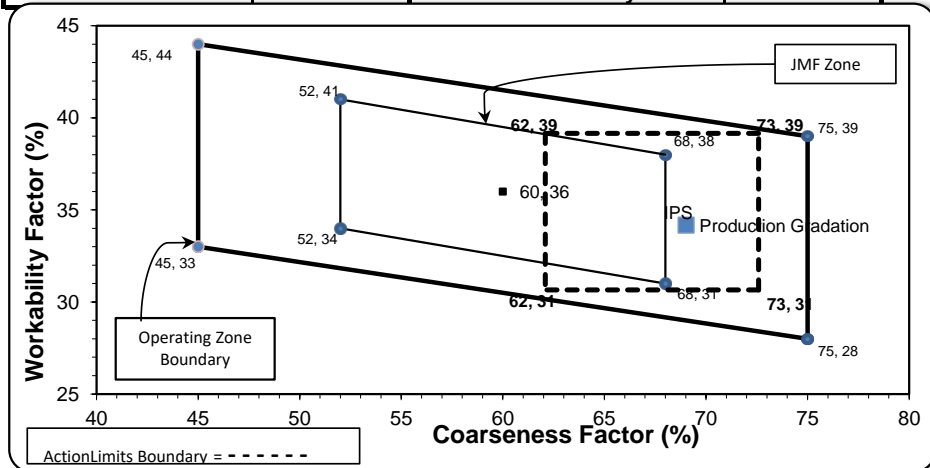
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 66.6 | 100.0 | 100.0 | 85.3 | 14.7 | 14.7 |
| 3/4" | 41.7 | 100.0 | 100.0 | 74.4 | 10.9 | 25.6 |
| 1/2" | 15.7 | 91.3 | 100.0 | 61.5 | 13.0 | 38.6 |
| 3/8" | 7.2 | 73.4 | 100.0 | 54.6 | 6.9 | 45.4 |
| #4 | 2.2 | 18.8 | 98.1 | 42.0 | 12.6 | 58.0 |
| #8 | 1.4 | 6.0 | 84.5 | 34.2 | 7.8 | 65.8 |
| #16 | 1.2 | 3.2 | 68.0 | 27.2 | 6.9 | 72.8 |
| #30 | 1.1 | 3.2 | 49.2 | 20.0 | 7.3 | 80.0 |
| #50 | 1.0 | 2.1 | 25.7 | 10.7 | 9.3 | 89.3 |
| #100 | 0.9 | 2.0 | 7.2 | 3.5 | 7.2 | 96.5 |
| LBW | 0.7 | 1.8 | 1.4 | 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: | 69 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| | |
|----------------------------|-----------|
| Coarseness Factor: | 67 |
| 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" | 85.5 | 14.5 | 14.5 |
| 3/4" | 73.4 | 12.1 | 26.6 |
| 1/2" | 61.0 | 12.4 | 39.0 |
| 3/8" | 56.2 | 4.8 | 43.8 |
| #4 | 43.1 | 13.1 | 56.9 |
| #8 | 34.9 | 8.2 | 65.1 |
| #16 | 29.4 | 5.5 | 70.6 |
| #30 | 21.6 | 7.8 | 78.4 |
| #50 | 8.1 | 13.4 | 91.9 |
| #100 | 2.2 | 5.9 | 97.8 |
| LBW | 1.4 | 0.8 | 98.6 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-103**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| CA | 58-003 | Stoneco | 1370 | 8.16 | 2.69 | 43.9 |
| IA | 58-003 | Stoneco | 550 | 3.28 | 2.69 | 17.6 |
| 2NS | 81-019 | Pleasant Lake | 1200 | 7.26 | 2.65 | 38.5 |
| Total Wt | | | 3120 | 18.70 | | 100.0 |

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



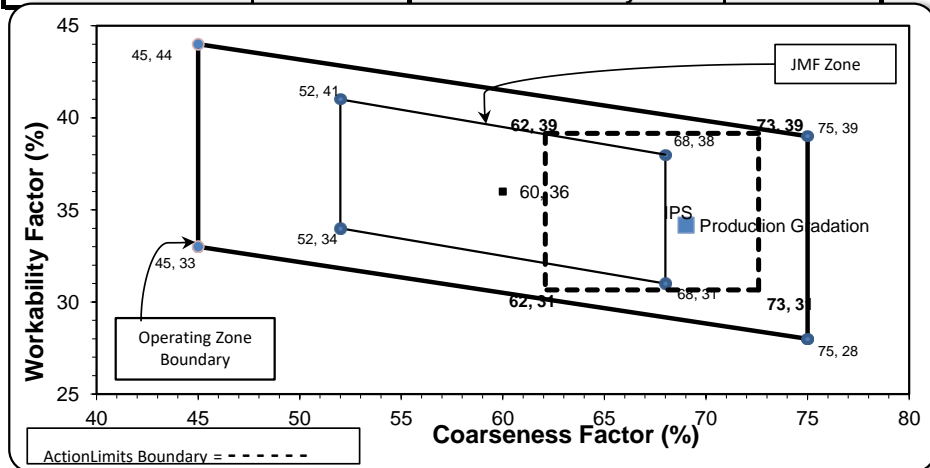
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 66.6 | 100.0 | 100.0 | 85.3 | 14.7 | 14.7 |
| 3/4" | 41.7 | 100.0 | 100.0 | 74.4 | 10.9 | 25.6 |
| 1/2" | 15.7 | 91.3 | 100.0 | 61.5 | 13.0 | 38.6 |
| 3/8" | 7.2 | 73.4 | 100.0 | 54.6 | 6.9 | 45.4 |
| #4 | 2.2 | 18.8 | 98.1 | 42.0 | 12.6 | 58.0 |
| #8 | 1.4 | 6.0 | 84.5 | 34.2 | 7.8 | 65.8 |
| #16 | 1.2 | 3.2 | 68.0 | 27.2 | 6.9 | 72.8 |
| #30 | 1.1 | 3.2 | 49.2 | 20.0 | 7.3 | 80.0 |
| #50 | 1.0 | 2.1 | 25.7 | 10.7 | 9.3 | 89.3 |
| #100 | 0.9 | 2.0 | 7.2 | 3.5 | 7.2 | 96.5 |
| LBW | 0.7 | 1.8 | 1.4 | 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: | 69 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| Coarseness Factor: | 67 | | |
|----------------------------|----------------------|------------|-----------------------|
| 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" | 85.5 | 14.5 | 14.5 |
| 3/4" | 73.4 | 12.1 | 26.6 |
| 1/2" | 61.0 | 12.4 | 39.0 |
| 3/8" | 56.2 | 4.8 | 43.8 |
| #4 | 43.1 | 13.1 | 56.9 |
| #8 | 34.9 | 8.2 | 65.1 |
| #16 | 29.4 | 5.5 | 70.6 |
| #30 | 21.6 | 7.8 | 78.4 |
| #50 | 8.1 | 13.4 | 91.9 |
| #100 | 2.2 | 5.9 | 97.8 |
| LBW | 1.4 | 0.8 | 98.6 |

PREPARED BY:
 SM, LLC Technical Service

Approved BY:

Aggregate Optimization Chart

PLANT #: **P-14**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|----------|--------------|-----------------|------------------|----------------|
| CA | 58-003 | Stoneco | 1370 | 8.16 | 2.69 | 43.9 |
| IA | 58-003 | Stoneco | 550 | 3.28 | 2.69 | 17.6 |
| 2NS | 19-55 | Schlegel | 1200 | 7.20 | 2.67 | 38.5 |
| Total Wt | | | 3120 | 18.64 | | 100.0 |

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



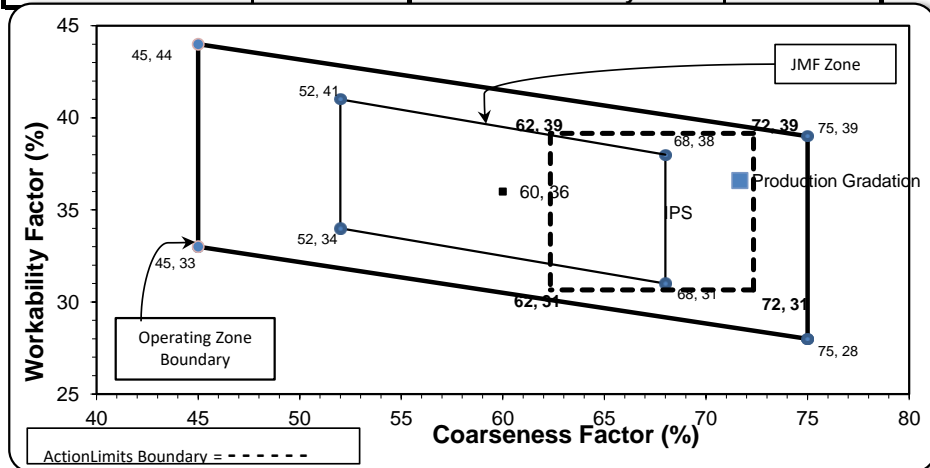
Builders Redi-Mix
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 66.6 | 100.0 | 100.0 | 85.3 | 14.7 | 14.7 |
| 3/4" | 41.7 | 100.0 | 100.0 | 74.4 | 10.9 | 25.6 |
| 1/2" | 15.7 | 91.3 | 100.0 | 61.5 | 13.0 | 38.6 |
| 3/8" | 7.2 | 73.4 | 100.0 | 54.6 | 6.9 | 45.4 |
| #4 | 2.2 | 18.8 | 100.0 | 42.7 | 11.8 | 57.3 |
| #8 | 1.4 | 6.0 | 90.8 | 36.6 | 6.1 | 63.4 |
| #16 | 1.2 | 3.2 | 71.2 | 28.5 | 8.1 | 71.5 |
| #30 | 1.1 | 3.2 | 48.1 | 19.5 | 8.9 | 80.5 |
| #50 | 1.0 | 2.1 | 16.9 | 7.3 | 12.2 | 92.7 |
| #100 | 0.9 | 2.0 | 3.2 | 2.0 | 5.3 | 98.0 |
| LBW | 0.7 | 1.8 | 0.3 | 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 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: | 72 | Workability Factor: | 37 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| Coarseness Factor: | 67 | | |
|----------------------------|----------------------|------------|-----------------------|
| 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" | 85.5 | 14.5 | 14.5 |
| 3/4" | 73.4 | 12.1 | 26.6 |
| 1/2" | 61.0 | 12.4 | 39.0 |
| 3/8" | 56.2 | 4.8 | 43.8 |
| #4 | 43.1 | 13.1 | 56.9 |
| #8 | 34.9 | 8.2 | 65.1 |
| #16 | 29.4 | 5.5 | 70.6 |
| #30 | 21.6 | 7.8 | 78.4 |
| #50 | 8.1 | 13.4 | 91.9 |
| #100 | 2.2 | 5.9 | 97.8 |
| LBW | 1.4 | 0.8 | 98.6 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-12**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 1020 | 6.24 | 2.62 | 33.2 |
| IA | 71-47 | Presque Isle | 800 | 4.89 | 2.62 | 26.1 |
| 2NS | 63-115 | Ray Rd | 1250 | 7.56 | 2.65 | 40.7 |
| Total Wt | | | 3070 | 18.69 | | 100.0 |

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



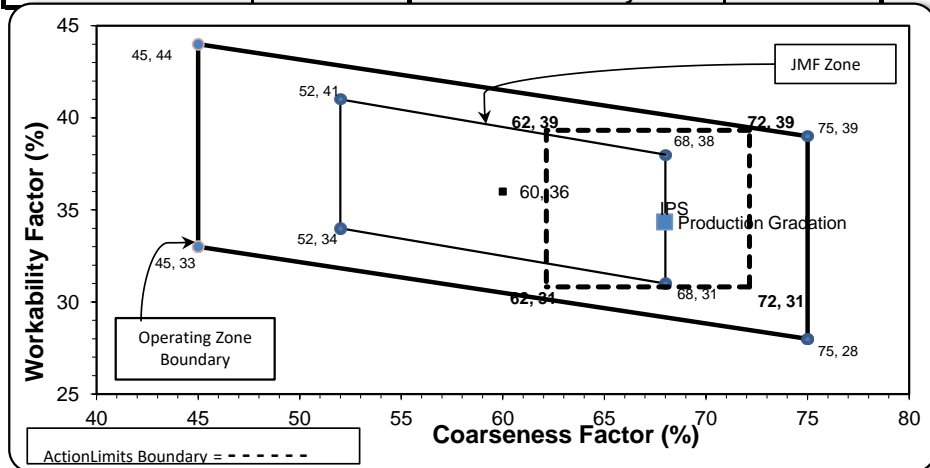
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 50.9 | 100.0 | 100.0 | 83.7 | 16.3 | 16.3 |
| 3/4" | 18.9 | 97.3 | 100.0 | 72.4 | 11.3 | 27.6 |
| 1/2" | 5.9 | 76.2 | 100.0 | 62.5 | 9.8 | 37.5 |
| 3/8" | 4.7 | 50.3 | 100.0 | 55.4 | 7.1 | 44.6 |
| #4 | 2.8 | 11.0 | 96.9 | 43.3 | 12.1 | 56.7 |
| #8 | 2.2 | 4.0 | 80.0 | 34.3 | 8.9 | 65.7 |
| #16 | 2.1 | 2.5 | 64.7 | 27.7 | 6.7 | 72.3 |
| #30 | 2.1 | 2.1 | 50.0 | 21.6 | 6.1 | 78.4 |
| #50 | 2.0 | 1.9 | 27.1 | 12.2 | 9.4 | 87.8 |
| #100 | 1.9 | 1.8 | 6.0 | 3.5 | 8.7 | 96.5 |
| LBW | 1.6 | 1.4 | 0.8 | 1.2 | 2.3 | 98.8 |

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

| | | | |
|---------------------------|-----------|----------------------------|-----------|
| Coarseness Factor: | 68 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



Intial Production Sample (IPS)

| | |
|----------------------------|-----------|
| Coarseness Factor: | 67 |
| Workability Factor: | 35 |

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.6 | 0.4 | 0.4 |
| 1" | 83.9 | 15.7 | 16.1 |
| 3/4" | 74.0 | 9.8 | 26.0 |
| 1/2" | 63.7 | 10.3 | 36.3 |
| 3/8" | 56.4 | 7.3 | 43.6 |
| #4 | 43.0 | 13.4 | 57.0 |
| #8 | 35.1 | 7.9 | 64.9 |
| #16 | 29.0 | 6.1 | 71.0 |
| #30 | 20.9 | 8.0 | 79.1 |
| #50 | 8.1 | 12.8 | 91.9 |
| #100 | 1.6 | 6.5 | 98.4 |
| LBW | 0.9 | 0.8 | 99.1 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: 11

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 920 | 5.63 | 2.62 | 30.0 |
| IA | 71-47 | Presque Isle | 900 | 5.50 | 2.62 | 29.3 |
| 2NS | 95-013 | Smelter Bay | 1250 | 7.56 | 2.65 | 40.7 |
| Total Wt | | | 3070 | 18.69 | | 100.0 |

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



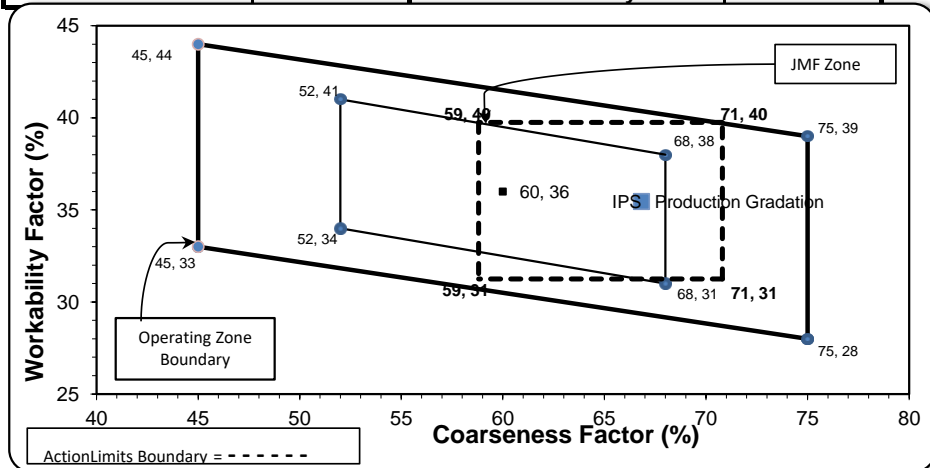
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 50.9 | 100.0 | 100.0 | 85.3 | 14.7 | 14.7 |
| 3/4" | 18.9 | 97.3 | 100.0 | 74.9 | 10.4 | 25.1 |
| 1/2" | 5.9 | 76.2 | 100.0 | 64.8 | 10.1 | 35.2 |
| 3/8" | 4.7 | 50.3 | 100.0 | 56.9 | 8.0 | 43.1 |
| #4 | 2.8 | 11.0 | 95.5 | 42.9 | 13.9 | 57.1 |
| #8 | 2.2 | 4.0 | 82.6 | 35.5 | 7.5 | 64.5 |
| #16 | 2.1 | 2.5 | 66.9 | 28.6 | 6.9 | 71.4 |
| #30 | 2.1 | 2.1 | 47.7 | 20.7 | 7.9 | 79.3 |
| #50 | 2.0 | 1.9 | 23.2 | 10.6 | 10.1 | 89.4 |
| #100 | 1.9 | 1.8 | 6.6 | 3.8 | 6.8 | 96.2 |
| LBW | 1.6 | 1.4 | 1.4 | 1.5 | 2.3 | 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 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: 65
Workability Factor: 36

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.0 | 0.6 | 0.6 |
| 1" | 84.0 | 15.3 | 16.0 |
| 3/4" | 73.5 | 10.5 | 26.5 |
| 1/2" | 65.2 | 8.2 | 34.8 |
| 3/8" | 58.2 | 7.1 | 41.8 |
| #4 | 44.1 | 14.1 | 55.9 |
| #8 | 35.5 | 8.6 | 64.5 |
| #16 | 29.1 | 6.4 | 70.9 |
| #30 | 21.9 | 7.3 | 78.1 |
| #50 | 9.6 | 12.2 | 90.4 |
| #100 | 2.6 | 7.1 | 97.4 |
| LBW | 1.0 | 1.6 | 99.0 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-32**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 920 | 5.63 | 2.62 | 30.0 |
| IA | 71-47 | Presque Isle | 900 | 5.50 | 2.62 | 29.3 |
| 2NS | 95-013 | Smelter Bay | 1250 | 7.56 | 2.65 | 40.7 |
| Total Wt | | | 3070 | 18.69 | | 100.0 |

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



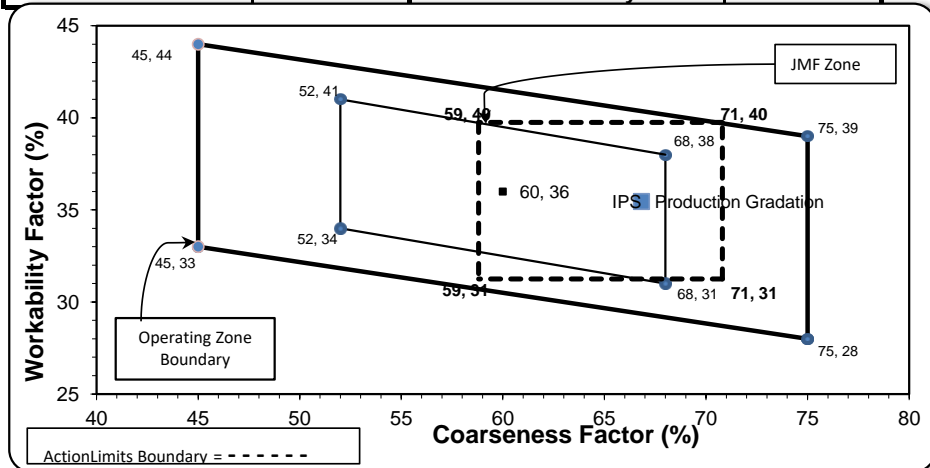
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 50.9 | 100.0 | 100.0 | 85.3 | 14.7 | 14.7 |
| 3/4" | 18.9 | 97.3 | 100.0 | 74.9 | 10.4 | 25.1 |
| 1/2" | 5.9 | 76.2 | 100.0 | 64.8 | 10.1 | 35.2 |
| 3/8" | 4.7 | 50.3 | 100.0 | 56.9 | 8.0 | 43.1 |
| #4 | 2.8 | 11.0 | 95.5 | 42.9 | 13.9 | 57.1 |
| #8 | 2.2 | 4.0 | 82.6 | 35.5 | 7.5 | 64.5 |
| #16 | 2.1 | 2.5 | 66.9 | 28.6 | 6.9 | 71.4 |
| #30 | 2.1 | 2.1 | 47.7 | 20.7 | 7.9 | 79.3 |
| #50 | 2.0 | 1.9 | 23.2 | 10.6 | 10.1 | 89.4 |
| #100 | 1.9 | 1.8 | 6.6 | 3.8 | 6.8 | 96.2 |
| LBW | 1.6 | 1.4 | 1.4 | 1.5 | 2.3 | 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 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: 65
Workability Factor: 36

| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.0 | 0.6 | 0.6 |
| 1" | 84.0 | 15.3 | 16.0 |
| 3/4" | 73.5 | 10.5 | 26.5 |
| 1/2" | 65.2 | 8.2 | 34.8 |
| 3/8" | 58.2 | 7.1 | 41.8 |
| #4 | 44.1 | 14.1 | 55.9 |
| #8 | 35.5 | 8.6 | 64.5 |
| #16 | 29.1 | 6.4 | 70.9 |
| #30 | 21.9 | 7.3 | 78.1 |
| #50 | 9.6 | 12.2 | 90.4 |
| #100 | 2.6 | 7.1 | 97.4 |
| LBW | 1.0 | 1.6 | 99.0 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-35**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|---------------|--------------|-----------------|------------------|----------------|
| CA | 58-003 | Stoneco | 1370 | 8.16 | 2.69 | 43.9 |
| IA | 58-003 | Stoneco | 550 | 3.28 | 2.69 | 17.6 |
| 2NS | 81-019 | Pleasant Lake | 1200 | 7.26 | 2.65 | 38.5 |
| Total Wt | | | 3120 | 18.70 | | 100.0 |

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



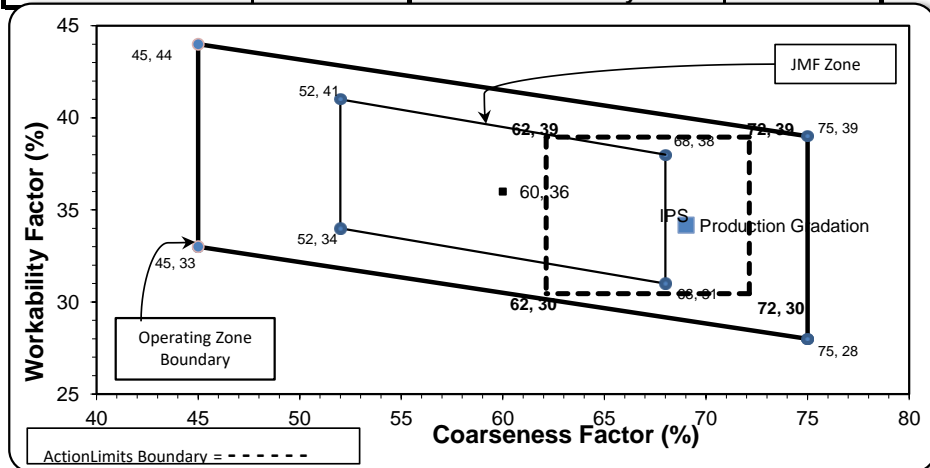
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 66.6 | 100.0 | 100.0 | 85.3 | 14.7 | 14.7 |
| 3/4" | 41.7 | 100.0 | 100.0 | 74.4 | 10.9 | 25.6 |
| 1/2" | 15.7 | 91.3 | 100.0 | 61.5 | 13.0 | 38.6 |
| 3/8" | 7.2 | 73.4 | 100.0 | 54.6 | 6.9 | 45.4 |
| #4 | 2.2 | 18.8 | 98.1 | 42.0 | 12.6 | 58.0 |
| #8 | 1.4 | 6.0 | 84.5 | 34.2 | 7.8 | 65.8 |
| #16 | 1.2 | 3.2 | 68.0 | 27.2 | 6.9 | 72.8 |
| #30 | 1.1 | 3.2 | 49.2 | 20.0 | 7.3 | 80.0 |
| #50 | 1.0 | 2.1 | 25.7 | 10.7 | 9.3 | 89.3 |
| #100 | 0.9 | 2.0 | 7.2 | 3.5 | 7.2 | 96.5 |
| LBW | 0.7 | 1.8 | 1.4 | 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: | 69 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| Coarseness Factor: | 67 | | |
|----------------------------|----------------------|------------|-----------------------|
| 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" | 86.9 | 13.1 | 13.1 |
| 3/4" | 76.1 | 10.8 | 23.9 |
| 1/2" | 63.7 | 12.4 | 36.3 |
| 3/8" | 56.2 | 7.5 | 43.8 |
| #4 | 43.2 | 13.0 | 56.8 |
| #8 | 34.7 | 8.5 | 65.3 |
| #16 | 27.5 | 7.2 | 72.5 |
| #30 | 20.6 | 7.0 | 79.4 |
| #50 | 9.0 | 11.6 | 91.0 |
| #100 | 2.1 | 6.9 | 97.9 |
| LBW | 1.0 | 1.1 | 99.0 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-36**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|-------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 950 | 5.81 | 2.62 | 30.9 |
| IA | 71-47 | Presque Isle | 920 | 5.63 | 2.62 | 30.0 |
| 2NS | 63-92 | Grange Hall | 1200 | 7.26 | 2.65 | 39.1 |
| Total Wt | | | 3070 | 18.70 | | 100.0 |

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



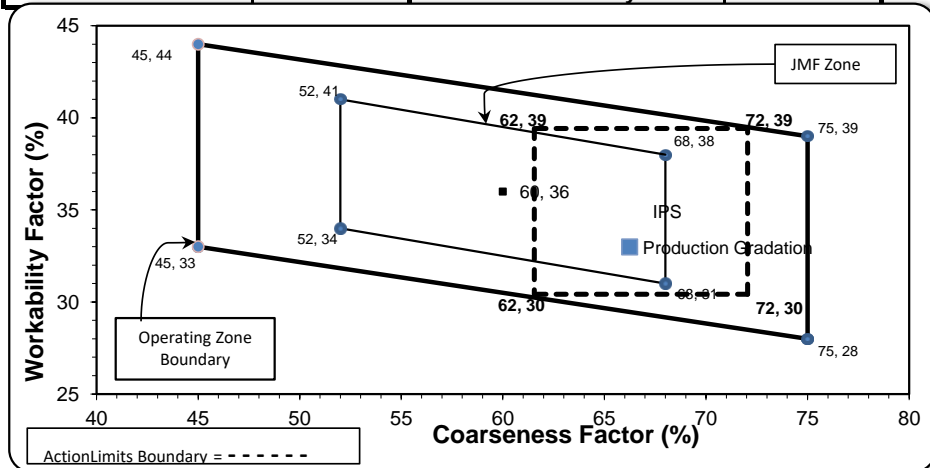
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 50.9 | 100.0 | 100.0 | 84.8 | 15.2 | 15.2 |
| 3/4" | 18.9 | 97.3 | 100.0 | 74.1 | 10.7 | 25.9 |
| 1/2" | 5.9 | 76.2 | 100.0 | 63.7 | 10.3 | 36.3 |
| 3/8" | 4.7 | 50.3 | 100.0 | 55.6 | 8.1 | 44.4 |
| #4 | 2.8 | 11.0 | 96.8 | 42.0 | 13.6 | 58.0 |
| #8 | 2.2 | 4.0 | 79.6 | 33.0 | 9.0 | 67.0 |
| #16 | 2.1 | 2.5 | 68.0 | 28.0 | 5.0 | 72.0 |
| #30 | 2.1 | 2.1 | 52.0 | 21.6 | 6.4 | 78.4 |
| #50 | 2.0 | 1.9 | 22.3 | 9.9 | 11.7 | 90.1 |
| #100 | 1.9 | 1.8 | 3.4 | 2.5 | 7.4 | 97.5 |
| LBW | 1.6 | 1.4 | 0.3 | 1.0 | 1.4 | 99.0 |

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

| | | | |
|---------------------------|-----------|----------------------------|-----------|
| Coarseness Factor: | 66 | Workability Factor: | 33 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| Coarseness Factor: | 67 | | |
|----------------------------|----------------------|------------|-----------------------|
| 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" | 85.0 | 15.0 | 15.0 |
| 3/4" | 72.1 | 12.9 | 27.9 |
| 1/2" | 64.5 | 7.6 | 35.5 |
| 3/8" | 56.5 | 8.0 | 43.5 |
| #4 | 42.7 | 13.8 | 57.3 |
| #8 | 34.9 | 7.8 | 65.1 |
| #16 | 29.0 | 5.9 | 71.0 |
| #30 | 21.0 | 8.0 | 79.0 |
| #50 | 8.2 | 12.8 | 91.8 |
| #100 | 1.6 | 6.5 | 98.4 |
| LBW | 0.7 | 0.9 | 99.3 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-39**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|-----------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 1020 | 6.24 | 2.62 | 33.2 |
| IA | 71-47 | Presque Isle | 800 | 4.89 | 2.62 | 26.1 |
| 2NS | 44-051 | Krake Willis Rd | 1250 | 7.56 | 2.65 | 40.7 |
| Total Wt | | | 3070 | 18.69 | | 100.0 |

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



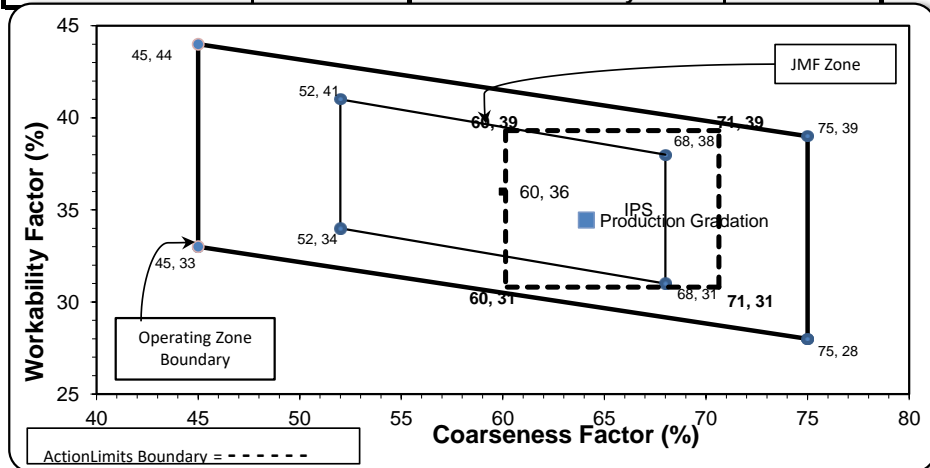
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 98.7 | 100.0 | 100.0 | 99.6 | 0.4 | 0.4 |
| 1" | 47.5 | 100.0 | 100.0 | 82.6 | 17.0 | 17.4 |
| 3/4" | 12.4 | 98.5 | 100.0 | 70.5 | 12.1 | 29.5 |
| 1/2" | 3.0 | 83.2 | 100.0 | 63.4 | 7.1 | 36.6 |
| 3/8" | 2.0 | 63.7 | 100.0 | 58.0 | 5.4 | 42.0 |
| #4 | 1.6 | 17.3 | 96.4 | 44.3 | 13.7 | 55.7 |
| #8 | 1.4 | 4.5 | 80.6 | 34.5 | 9.8 | 65.5 |
| #16 | 1.4 | 2.7 | 65.7 | 27.9 | 6.5 | 72.1 |
| #30 | 1.3 | 2.3 | 48.1 | 20.6 | 7.3 | 79.4 |
| #50 | 1.2 | 2.1 | 23.7 | 10.6 | 10.0 | 89.4 |
| #100 | 1.1 | 1.9 | 7.2 | 3.8 | 6.8 | 96.2 |
| LBW | 0.9 | 1.7 | 0.9 | 1.1 | 2.7 | 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: | 64 | Workability Factor: | 34 |
|---------------------------|-----------|----------------------------|-----------|



Initial Production Sample (IPS)

| Coarseness Factor: | 65 | | |
|----------------------------|----------------------|------------|-----------------------|
| Workability Factor: | 35 | | |
| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 99.6 | 0.4 | 0.4 |
| 1" | 83.9 | 15.7 | 16.1 |
| 3/4" | 74.1 | 9.8 | 25.9 |
| 1/2" | 64.3 | 9.7 | 35.7 |
| 3/8" | 57.5 | 6.8 | 42.5 |
| #4 | 44.5 | 13.1 | 55.5 |
| #8 | 35.1 | 9.4 | 64.9 |
| #16 | 27.9 | 7.2 | 72.1 |
| #30 | 21.7 | 6.2 | 78.3 |
| #50 | 12.6 | 9.1 | 87.4 |
| #100 | 3.5 | 9.1 | 96.5 |
| LBW | 1.2 | 2.4 | 98.8 |

PREPARED BY:
 SM, LLC Technical Service

Approved By:

Aggregate Optimization Chart

PLANT #: **P-O2**

Sample Date: 11/14/22

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/15/2022 through 11/21/2022

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 950 | 5.81 | 2.62 | 30.9 |
| IA | 71-47 | Presque Isle | 870 | 5.32 | 2.62 | 28.3 |
| 2NS | 63-115 | Ray Rd | 1250 | 7.56 | 2.65 | 40.7 |
| Total Wt | | | 3070 | 18.69 | | 100.0 |

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



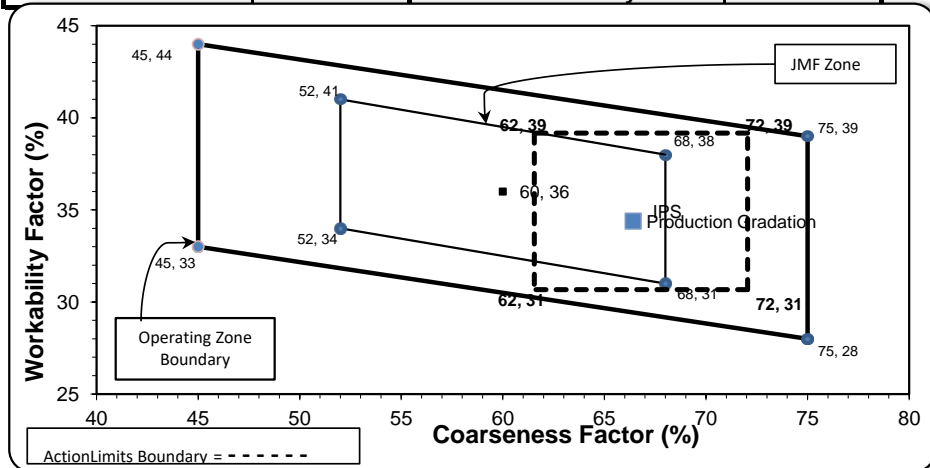
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 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" | 50.9 | 100.0 | 100.0 | 84.8 | 15.2 | 15.2 |
| 3/4" | 18.9 | 97.3 | 100.0 | 74.1 | 10.7 | 25.9 |
| 1/2" | 5.9 | 76.2 | 100.0 | 64.1 | 10.0 | 35.9 |
| 3/8" | 4.7 | 50.3 | 100.0 | 56.4 | 7.7 | 43.6 |
| #4 | 2.8 | 11.0 | 96.9 | 43.4 | 13.0 | 56.6 |
| #8 | 2.2 | 4.0 | 80.0 | 34.4 | 9.1 | 65.6 |
| #16 | 2.1 | 2.5 | 64.7 | 27.7 | 6.7 | 72.3 |
| #30 | 2.1 | 2.1 | 50.0 | 21.6 | 6.1 | 78.4 |
| #50 | 2.0 | 1.9 | 27.1 | 12.2 | 9.4 | 87.8 |
| #100 | 1.9 | 1.8 | 6.0 | 3.5 | 8.7 | 96.5 |
| LBW | 1.6 | 1.4 | 0.8 | 1.2 | 2.3 | 98.8 |

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 66 **Workability Factor:** 34



Initial Production Sample (IPS)

Coarseness Factor: 67
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" | 85.0 | 15.0 | 15.0 |
| 3/4" | 72.3 | 12.7 | 27.7 |
| 1/2" | 64.5 | 7.8 | 35.5 |
| 3/8" | 56.5 | 8.0 | 43.5 |
| #4 | 42.7 | 13.8 | 57.3 |
| #8 | 34.9 | 7.8 | 65.1 |
| #16 | 29.0 | 5.9 | 71.0 |
| #30 | 21.0 | 8.0 | 79.0 |
| #50 | 8.2 | 12.8 | 91.8 |
| #100 | 1.6 | 6.5 | 98.4 |
| LBW | 0.7 | 0.9 | 99.3 |

PREPARED BY:
 SM, LLC Technical Service

Approved By: