

Aggregate Optimization Chart

PLANT #: **P-102**

Sample Date: 11/4/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/5/2024 through 11/11/2024

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|----------|--------------|-----------------|------------------|----------------|
| CA | 58-003 | Stoneco | 1470 | 8.76 | 2.69 | 47.1 |
| IA | 58-003 | Stoneco | 450 | 2.68 | 2.69 | 14.4 |
| 2NS | 63-114 | Highland | 1200 | 7.26 | 2.65 | 38.5 |
| Total Wt | | | 3120 | 18.70 | | 100.0 |

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



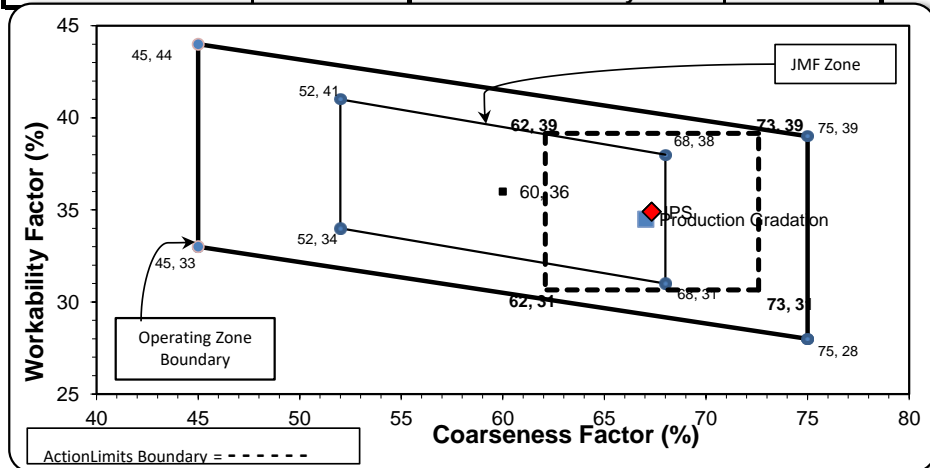
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 61.4 | 100.0 | 100.0 | 81.8 | 18.2 | 18.2 |
| 3/4" | 38.3 | 100.0 | 100.0 | 70.9 | 10.9 | 29.1 |
| 1/2" | 18.6 | 94.8 | 100.0 | 60.9 | 10.0 | 39.1 |
| 3/8" | 14.4 | 75.2 | 100.0 | 56.1 | 4.8 | 43.9 |
| #4 | 4.0 | 17.2 | 99.1 | 42.5 | 13.6 | 57.5 |
| #8 | 2.1 | 3.5 | 85.8 | 34.5 | 8.0 | 65.5 |
| #16 | 1.8 | 1.9 | 67.9 | 27.2 | 7.3 | 72.8 |
| #30 | 1.6 | 1.5 | 47.8 | 19.4 | 7.9 | 80.6 |
| #50 | 1.6 | 1.3 | 22.3 | 9.5 | 9.8 | 90.5 |
| #100 | 1.4 | 1.1 | 4.8 | 2.7 | 6.9 | 97.3 |
| LBW | 1.3 | 0.6 | 0.5 | 0.9 | 1.8 | 99.1 |

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **67** **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: 11/4/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/5/2024 through 11/11/2024

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|----------|--------------|-----------------|------------------|----------------|
| CA | 58-003 | Stoneco | 1470 | 8.76 | 2.69 | 47.1 |
| IA | 58-003 | Stoneco | 450 | 2.68 | 2.69 | 14.4 |
| 2NS | 63-114 | Highland | 1200 | 7.26 | 2.65 | 38.5 |
| Total Wt | | | 3120 | 18.70 | | 100.0 |

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



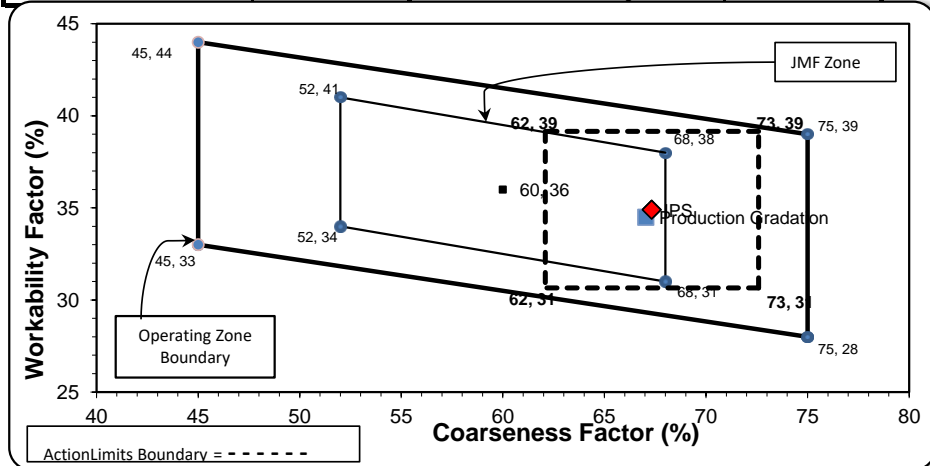
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 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| 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" | 61.4 | 100.0 | 100.0 | 81.8 | 18.2 | 18.2 |
| 3/4" | 38.3 | 100.0 | 100.0 | 70.9 | 10.9 | 29.1 |
| 1/2" | 18.6 | 94.8 | 100.0 | 60.9 | 10.0 | 39.1 |
| 3/8" | 14.4 | 75.2 | 100.0 | 56.1 | 4.8 | 43.9 |
| #4 | 4.0 | 17.2 | 99.1 | 42.5 | 13.6 | 57.5 |
| #8 | 2.1 | 3.5 | 85.8 | 34.5 | 8.0 | 65.5 |
| #16 | 1.8 | 1.9 | 67.9 | 27.2 | 7.3 | 72.8 |
| #30 | 1.6 | 1.5 | 47.8 | 19.4 | 7.9 | 80.6 |
| #50 | 1.6 | 1.3 | 22.3 | 9.5 | 9.8 | 90.5 |
| #100 | 1.4 | 1.1 | 4.8 | 2.7 | 6.9 | 97.3 |
| LBW | 1.3 | 0.6 | 0.5 | 0.9 | 1.8 | 99.1 |

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **67** **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 #: 12

Sample Date: 11/4/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/5/2024 through 11/11/2024

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 870 | 5.32 | 2.62 | 28.3 |
| IA | 71-47 | Presque Isle | 1000 | 6.12 | 2.62 | 32.6 |
| 2NS | 63-115 | Ray Rd | 1200 | 7.26 | 2.65 | 39.1 |
| Total Wt | | | 3070 | 18.70 | | 100.0 |

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



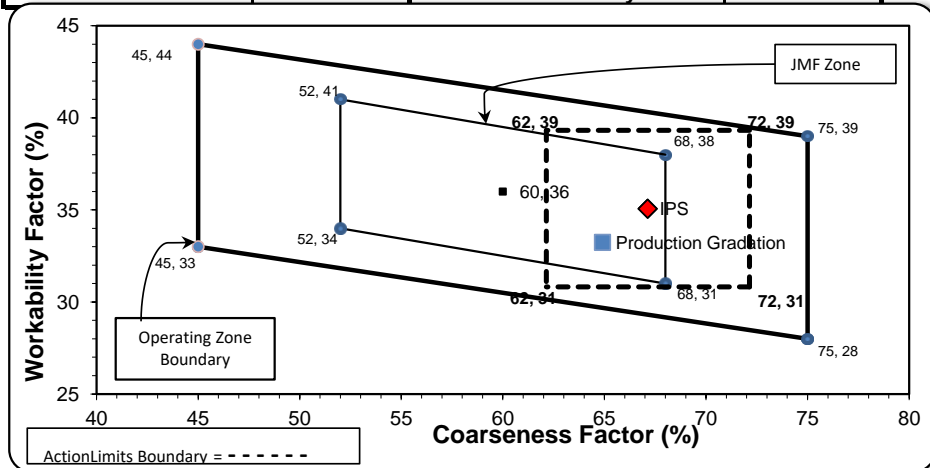
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 98.4 | 100.0 | 100.0 | 99.5 | 0.5 | 0.5 |
| 1" | 28.8 | 100.0 | 100.0 | 79.8 | 19.7 | 20.2 |
| 3/4" | 7.8 | 99.4 | 100.0 | 73.7 | 6.1 | 26.3 |
| 1/2" | 3.5 | 80.1 | 100.0 | 66.2 | 7.5 | 33.8 |
| 3/8" | 2.6 | 51.7 | 100.0 | 56.7 | 9.5 | 43.3 |
| #4 | 1.8 | 9.0 | 98.0 | 41.7 | 14.9 | 58.3 |
| #8 | 1.6 | 3.2 | 81.2 | 33.2 | 8.5 | 66.8 |
| #16 | 1.6 | 2.3 | 65.5 | 26.8 | 6.4 | 73.2 |
| #30 | 1.4 | 2.1 | 50.1 | 20.7 | 6.1 | 79.3 |
| #50 | 1.4 | 2.0 | 26.2 | 11.3 | 9.4 | 88.7 |
| #100 | 1.3 | 1.9 | 5.9 | 3.3 | 8.0 | 96.7 |
| LBW | 1.0 | 1.7 | 1.3 | 1.3 | 1.9 | 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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: 65 **Workability Factor:** 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" | 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 #: P11

Sample Date: 11/4/24

Concrete Grade: P1M, 3500HP

Dates Test Represents: 11/5/2024 through 11/11/2024

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 870 | 5.32 | 2.62 | 28.3 |
| IA | 71-47 | Presque Isle | 1000 | 6.12 | 2.62 | 32.6 |
| 2NS | 63-115 | Ray Rd | 1200 | 7.26 | 2.65 | 39.1 |
| Total Wt | | | 3070 | 18.70 | | 100.0 |

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



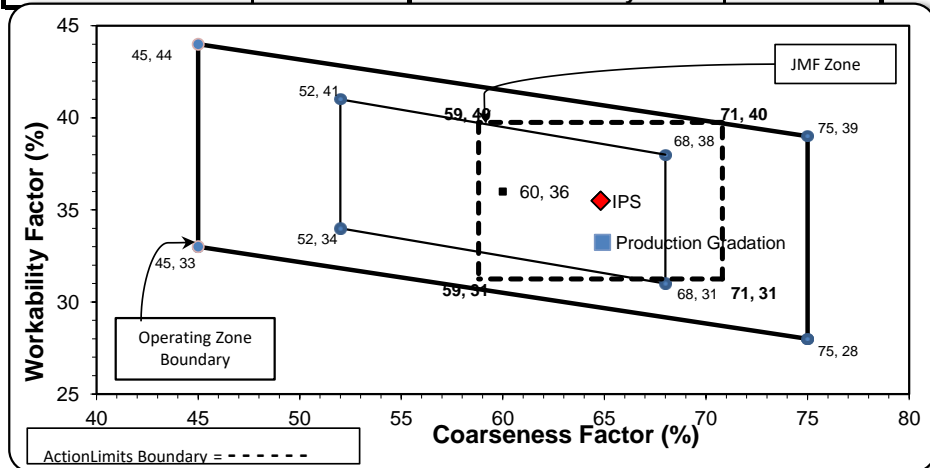
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 98.4 | 100.0 | 100.0 | 99.5 | 0.5 | 0.5 |
| 1" | 28.8 | 100.0 | 100.0 | 79.8 | 19.7 | 20.2 |
| 3/4" | 7.8 | 99.4 | 100.0 | 73.7 | 6.1 | 26.3 |
| 1/2" | 3.5 | 80.1 | 100.0 | 66.2 | 7.5 | 33.8 |
| 3/8" | 2.6 | 51.7 | 100.0 | 56.7 | 9.5 | 43.3 |
| #4 | 1.8 | 9.0 | 98.0 | 41.7 | 14.9 | 58.3 |
| #8 | 1.6 | 3.2 | 81.2 | 33.2 | 8.5 | 66.8 |
| #16 | 1.6 | 2.3 | 65.5 | 26.8 | 6.4 | 73.2 |
| #30 | 1.4 | 2.1 | 50.1 | 20.7 | 6.1 | 79.3 |
| #50 | 1.4 | 2.0 | 26.2 | 11.3 | 9.4 | 88.7 |
| #100 | 1.3 | 1.9 | 5.9 | 3.3 | 8.0 | 96.7 |
| LBW | 1.0 | 1.7 | 1.3 | 1.3 | 1.9 | 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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **65** Workability Factor: **33**



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-02**

Sample Date: 11/4/24

Concrete Grade: **P1M, 3500HP**

Dates Test Represents: 11/5/2024 through 11/11/2024

Contractor: _____

MDOT No.: _____

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|
| CA | 71-47 | Presque Isle | 870 | 5.32 | 2.62 | 28.3 |
| IA | 71-47 | Presque Isle | 1000 | 6.12 | 2.62 | 32.6 |
| 2NS | 63-115 | Ray Rd | 1200 | 7.26 | 2.65 | 39.1 |
| Total Wt | | | 3070 | 18.70 | | 100.0 |

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



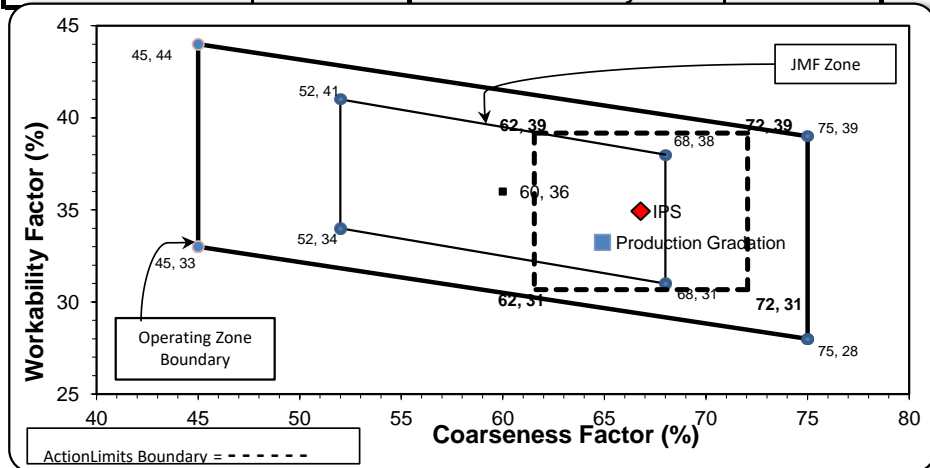
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336

| Sieve | CA | IA | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 98.4 | 100.0 | 100.0 | 99.5 | 0.5 | 0.5 |
| 1" | 28.8 | 100.0 | 100.0 | 79.8 | 19.7 | 20.2 |
| 3/4" | 7.8 | 99.4 | 100.0 | 73.7 | 6.1 | 26.3 |
| 1/2" | 3.5 | 80.1 | 100.0 | 66.2 | 7.5 | 33.8 |
| 3/8" | 2.6 | 51.7 | 100.0 | 56.7 | 9.5 | 43.3 |
| #4 | 1.8 | 9.0 | 98.0 | 41.7 | 14.9 | 58.3 |
| #8 | 1.6 | 3.2 | 81.2 | 33.2 | 8.5 | 66.8 |
| #16 | 1.6 | 2.3 | 65.5 | 26.8 | 6.4 | 73.2 |
| #30 | 1.4 | 2.1 | 50.1 | 20.7 | 6.1 | 79.3 |
| #50 | 1.4 | 2.0 | 26.2 | 11.3 | 9.4 | 88.7 |
| #100 | 1.3 | 1.9 | 5.9 | 3.3 | 8.0 | 96.7 |
| LBW | 1.0 | 1.7 | 1.3 | 1.3 | 1.9 | 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 8% for the 1" sieve when a 2" max. size (nom. Max. 1.5") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **65** Workability Factor: **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" | 72.3 | 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: