

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

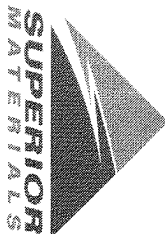
Sample Date: 9/11/23

Dates Test Represents: 9/12/2023 through 9/18/2023

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



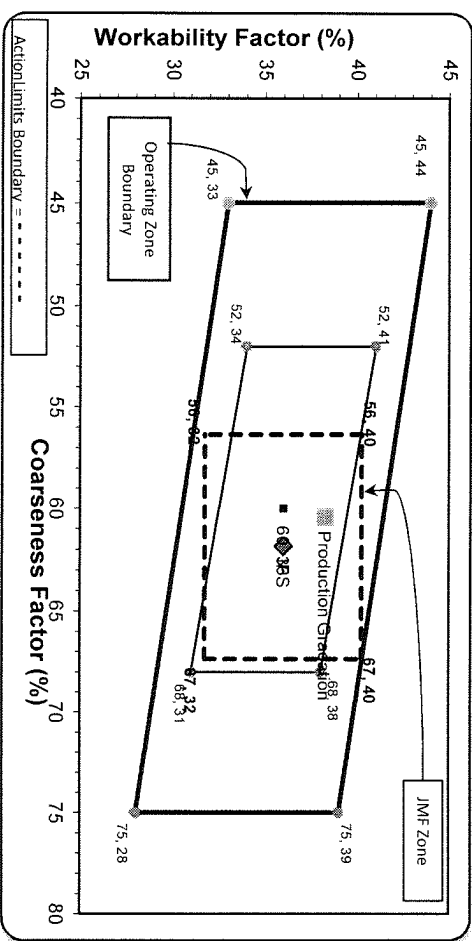
Superior Materials, LLC
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | Contribution % | |
|-----------------|--------|--------------|--------------|-----------------|------------------|----------------|--------------|
| 6AA | 71-47 | Presque Isle | 1455 | 8.90 | 2.62 | 50.1 | |
| 26A | 71-47 | Presque Isle | 300 | 1.83 | 2.62 | 10.3 | |
| 2NS | 95-013 | Smelter Bay | 1150 | 6.95 | 2.65 | 39.6 | |
| Total Wt | | | | | | 2905 | 17.69 |
| | | | | | | 100.0 | |

| Sieve | % Retained | Cumulative % Retained |
|-------|------------|-----------------------|
| 2" | 0.0 | 0.0 |
| 1.5" | 0.0 | 0.0 |
| 1" | 1.1 | 1.1 |
| 3/4" | 9.1 | 10.2 |
| 1/2" | 18.8 | 29.0 |
| 3/8" | 9.8 | 38.8 |
| #4 | 17.8 | 56.6 |
| #8 | 7.6 | 64.2 |
| #16 | 6.7 | 70.9 |
| #30 | 7.9 | 78.8 |
| #50 | 10.3 | 89.0 |
| #100 | 7.0 | 96.0 |
| LBW | 2.8 | 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 4% for the 3/4" sieve when a 1.5" max. size (nom. Max. 1.0") aggregate is used.

| Production Gradation | Batch Plant Gradations | Aggregate Supplier Gradations | Adjusted WF |
|---|---|-------------------------------|-------------|
| <input checked="" type="radio"/> Coarseness Factor: 60 | <input type="radio"/> Workability Factor: 36 | | 38.3 |



| 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" | 95.0 | 5.0 | 5.0 |
| 1/2" | 72.3 | 22.8 | 27.7 |
| 3/8" | 60.4 | 11.8 | 39.6 |
| #4 | 42.6 | 17.8 | 57.4 |
| #8 | 36.0 | 6.6 | 64.0 |
| #16 | 29.5 | 6.5 | 70.5 |
| #30 | 20.3 | 9.2 | 79.7 |
| #50 | 9.5 | 10.8 | 90.5 |
| #100 | 3.4 | 6.1 | 96.6 |
| LBW | 1.3 | 2.1 | 98.7 |

PREPARED BY:
SM, LLC Technical Service

Approved By: _____

Plant 958-JMT

Product 1054-6AA LS PI

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

| Procedure | Sieve/Test | Result | Unit | 6AA LS PI Spec |
|-----------|-----------------------|--------|------|----------------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | 100-100 |
| | 1" (25mm) | 97.8 | % | 95-100 |
| | 3/4" (19mm) | 79.6 | % | |
| | 1/2" (12.5mm) | 43.3 | % | 30-60 |
| | 3/8" (9.5mm) | 25.5 | % | |
| | #4 (4.75mm) | 5.2 | % | 0-8 |
| | #8 (2.36mm) | 2.7 | % | |
| | #16 (1.18mm) | 2.2 | % | |
| | #30 (.6mm) | 2.1 | % | |
| | #50 (.3mm) | 2.0 | % | |
| | #100 (.15mm) | 1.9 | % | |
| | #200 (75µm) | 1.6 | % | |
| | Wash Loss (#200/75um) | 1.4 | % | 0-2 |
| | Total Moisture | 2.6 | % | |

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

| Procedure | Sieve/Test | Result | Unit | 2NS GR Spec |
|-----------|-----------------------|--------|------|-------------|
| | 3/8" (9.5mm) | 100.0 | % | 100-100 |
| | #4 (4.75mm) | 97.2 | % | 95-100 |
| | #8 (2.36mm) | 85.4 | % | 65-95 |
| | #16 (1.18mm) | 69.9 | % | 35-75 |
| | #30 (.6mm) | 50.3 | % | 20-55 |
| | #50 (.3mm) | 24.6 | % | 10-30 |
| | #100 (.15mm) | 7.2 | % | 0-10 |
| | #200 (75µm) | 1.6 | % | |
| | FM | 2.65 | | 2.6-3 |
| | Wash Loss (#200/75um) | 0.9 | % | 0-3 |
| | Total Moisture | 4.0 | % | |

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

| Procedure | Sieve/Test | Result | Unit | 26A Mod LS Spec |
|-----------|-----------------------|--------|------|-----------------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | |
| | 1" (25mm) | 100.0 | % | |
| | 3/4" (19mm) | 100.0 | % | 100-100 |
| | 1/2" (12.5mm) | 94.4 | % | 95-100 |
| | 3/8" (9.5mm) | 85.5 | % | 60-95 |
| | #4 (4.75mm) | 22.3 | % | 5-30 |
| | #8 (2.36mm) | 5.8 | % | 0-12 |
| | #16 (1.18mm) | 3.1 | % | |
| | #30 (.6mm) | 2.5 | % | |
| | #50 (.3mm) | 2.2 | % | |
| | #100 (.15mm) | 2.0 | % | |
| | #200 (75µm) | 1.8 | % | |
| | Wash Loss (#200/75um) | 1.7 | % | 0-3 |
| | Total Moisture | 2.7 | % | |

Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-102

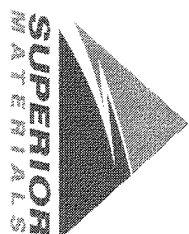
Sample Date: 9/11/23

Dates Test Represents: 9/12/2023 through 9/18/2023

Concrete Grade: DM, 4500HP

Contractor: _____

MDOT No.: _____



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

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

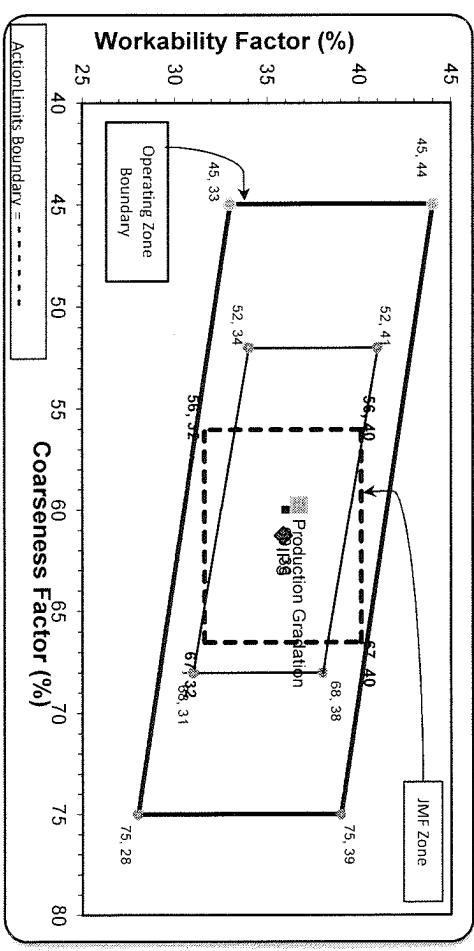
| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | Contribution % |
|------------|--------|---------------|--------------|-----------------|------------------|----------------|
| 6AA | 58-003 | Stoneco | 1500 | 8.94 | 2.69 | 50.8 |
| 26A | 58-003 | Stoneco | 300 | 1.79 | 2.69 | 10.2 |
| 2NS | 81-019 | Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |
| Total Wt | | | 2950 | 17.68 | | 100.0 |

| Sieve | 6AA | 26A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 99.5 | 100.0 | 100.0 | 99.7 | 0.3 | 0.3 |
| 3/4" | 78.3 | 100.0 | 100.0 | 89.0 | 10.8 | 11.0 |
| 1/2" | 41.7 | 99.1 | 100.0 | 70.3 | 18.7 | 29.7 |
| 3/8" | 24.4 | 91.5 | 100.0 | 60.7 | 9.6 | 39.3 |
| #4 | 4.2 | 16.8 | 98.2 | 42.1 | 18.6 | 57.9 |
| #8 | 2.0 | 3.9 | 84.2 | 34.2 | 7.9 | 65.8 |
| #16 | 1.7 | 3.8 | 67.5 | 27.6 | 6.7 | 72.4 |
| #30 | 1.6 | 3.4 | 49.7 | 20.5 | 7.0 | 79.5 |
| #50 | 1.6 | 3.2 | 25.8 | 11.2 | 9.3 | 88.8 |
| #100 | 1.5 | 3.1 | 7.3 | 3.9 | 7.3 | 96.1 |
| LBW | 1.2 | 3.0 | 1.3 | 1.4 | 2.5 | 98.6 |

*Maximum % Retained must be above the 3/8" sieve.
 *Any two adjacent sieves must equal 10% except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for each sieve except max.
 nom. max. #100 and #200 sieves.
 *% Retained must be at least 4% for the 3/4" sieve when
 a 1.5" max. size (nom. Max. 1.0") aggregate is used.

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **60** Workability Factor: **34** Adjusted WF: **36.7**



| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 99.3 | 0.7 | 0.7 |
| 3/4" | 89.2 | 10.1 | 10.8 |
| 1/2" | 70.7 | 18.5 | 29.3 |
| 3/8" | 60.7 | 10.0 | 39.3 |
| #4 | 44.4 | 16.3 | 55.6 |
| #8 | 35.9 | 8.5 | 64.1 |
| #16 | 27.3 | 8.6 | 72.7 |
| #30 | 19.1 | 8.2 | 80.9 |
| #50 | 7.4 | 11.7 | 92.6 |
| #100 | 1.9 | 5.6 | 98.1 |
| LBW | 0.7 | 1.2 | 99.3 |

PREPARED BY:
SM, LLC Technical Service

Approved By: _____



Plant S102-Superior Novi

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

| Procedure | Sieve/Test | Result | Unit | 6AA LS |
|-----------|-----------------------|--------|------|---------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | 100-100 |
| | 1" (25mm) | 99.5 | % | 95-100 |
| | 3/4" (19mm) | 78.3 | % | |
| | 1/2" (12.5mm) | 41.7 | % | 30-60 |
| | 3/8" (9.5mm) | 24.4 | % | |
| | #4 (4.75mm) | 4.2 | % | 0-8 |
| | #8 (2.36mm) | 2.0 | % | |
| | #16 (1.18mm) | 1.7 | % | |
| | #30 (.6mm) | 1.6 | % | |
| | #50 (.3mm) | 1.6 | % | |
| | #100 (.15mm) | 1.5 | % | |
| | #200 (75µm) | 1.37 | % | |
| | Wash Loss (#200/75um) | 1.2 | % | 0-2 |
| | Total Moisture | 3.54 | % | |



Plant S102-Superior Novi

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

| Procedure | Sieve/Test | Result | Unit | 26A Mod LS Spec |
|-----------|-----------------------|--------|------|-----------------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | |
| | 1" (25mm) | 100.0 | % | |
| | 3/4" (19mm) | 100.0 | % | 100-100 |
| | 1/2" (12.5mm) | 99.1 | % | 95-100 |
| | 3/8" (9.5mm) | 91.5 | % | 60-95 |
| | #4 (4.75mm) | 16.8 | % | 5-30 |
| | #8 (2.36mm) | 3.9 | % | 0-12 |
| | #16 (1.18mm) | 3.8 | % | |
| | #30 (.6mm) | 3.4 | % | |
| | #50 (.3mm) | 3.2 | % | |
| | #100 (.15mm) | 3.1 | % | |
| | #200 (75µm) | 3.0 | % | |
| | Wash Loss (#200/75um) | 3.0 | % | 0-3 |
| | Total Moisture | 5.29 | % | |



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 09/10/2023 - 09/16/2023

Report Date 09/16/2023

| Procedure | Sieve/Test | Result | Unit | 2NS GR Spec |
|-----------|-----------------------|--------|------|-------------|
| | 3/8" (9.5mm) | 100.0 | % | 100-100 |
| | #4 (4.75mm) | 98.2 | % | 95-100 |
| | #8 (2.36mm) | 84.2 | % | 65-95 |
| | #16 (1.18mm) | 67.5 | % | 35-75 |
| | #30 (.6mm) | 49.7 | % | 20-55 |
| | #50 (.3mm) | 25.8 | % | 10-30 |
| | #100 (.15mm) | 7.3 | % | 0-10 |
| | #200 (75µm) | 2.0 | % | |
| | FM | 2.67 | | 2.6-3 |
| | Wash Loss (#200/75um) | 1.3 | % | 0-3 |
| | Total Moisture | 3.27 | % | |