

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **12**

Sample Date: **8/28/23**

Dates Test Represents: **8/29/2023**

through **9/4/2023**

Concrete Grade: **DM 4500HP**

Contractor: _____

MDOT No.: _____

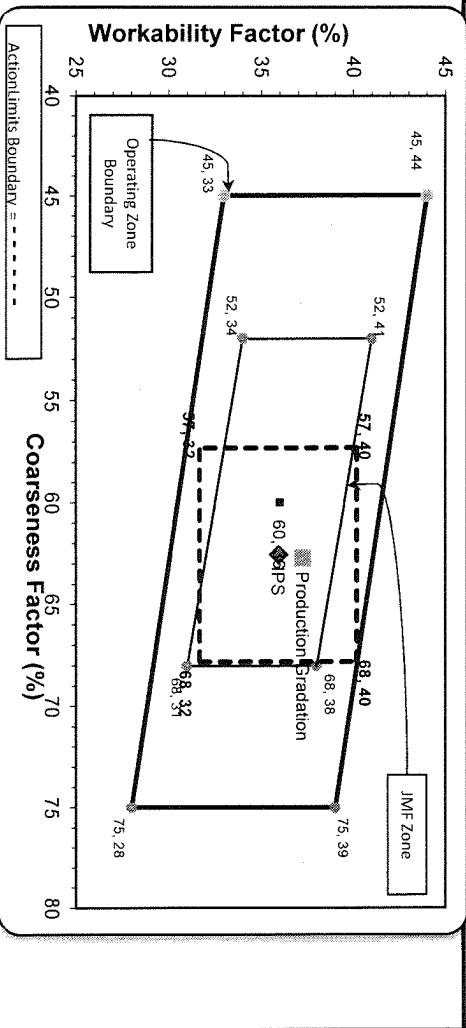
| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | Contribution % |
|------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1550 | 9.48 | 2.62 | 53.4 |
| 26A | 71-47 | Presque Isle | 205 | 1.25 | 2.62 | 7.1 |
| 2NS | 63-115 | Ray Rd | 1150 | 6.95 | 2.65 | 39.6 |
| Total Wt | | | | | | 2905 |
| | | | | | | 100.0 |

Verify this number is 100%

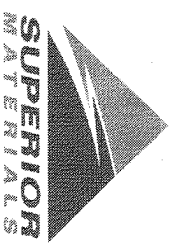
| Sieve | 6AA | 26A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|-------|-------|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 98.3 | 100.0 | 100.0 | 99.1 | 0.9 | 0.9 |
| 3/4" | 83.7 | 100.0 | 100.0 | 91.3 | 7.8 | 8.7 |
| 1/2" | 43.4 | 100.0 | 100.0 | 69.5 | 21.8 | 30.5 |
| 3/8" | 24.9 | 88.0 | 100.0 | 59.1 | 10.4 | 40.9 |
| #4 | 4.6 | 28.4 | 96.8 | 42.8 | 16.3 | 57.2 |
| #8 | 2.6 | 7.9 | 82.9 | 34.8 | 8.0 | 65.2 |
| #16 | 2.2 | 3.7 | 68.2 | 28.4 | 6.3 | 71.6 |
| #30 | 2.1 | 2.8 | 50.9 | 21.5 | 7.0 | 78.5 |
| #50 | 2.0 | 2.4 | 25.2 | 11.2 | 10.3 | 88.8 |
| #100 | 1.8 | 2.1 | 5.4 | 3.2 | 8.0 | 96.8 |
| LBW | 1.1 | 1.8 | 0.7 | 1.0 | 2.3 | 99.0 |

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

| Production Gradation | Batch Plant Gradations | Aggregate Supplier Gradations | Adjusted WF |
|----------------------------------|------------------------|-------------------------------|-------------|
| <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | 37.3 |



| 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" | 89.0 | 10.3 | 11.0 |
| 1/2" | 70.3 | 18.7 | 29.7 |
| 3/8" | 59.9 | 10.4 | 40.1 |
| #4 | 41.9 | 18.0 | 58.1 |
| #8 | 35.9 | 6.0 | 64.1 |
| #16 | 27.8 | 8.2 | 72.2 |
| #30 | 18.9 | 8.8 | 81.1 |
| #50 | 6.3 | 12.6 | 93.7 |
| #100 | 1.7 | 4.6 | 98.3 |
| LBW | 1.0 | 0.7 | 99.0 |



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

PREPARED BY:
 SM, LLC Technical Service

Approved By: _____



Plant S12-Onsite Southfield

Product 1051-6AA LS

Name/Title Doug Storey / QC Technician

Period: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 6AA LS |
|-----------|-----------------------|--------|------|---------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | 100-100 |
| | 1" (25mm) | 98.3 | % | 95-100 |
| | 3/4" (19mm) | 83.7 | % | |
| | 1/2" (12.5mm) | 43.4 | % | 30-60 |
| | 3/8" (9.5mm) | 24.9 | % | |
| | #4 (4.75mm) | 4.6 | % | 0-8 |
| | #8 (2.36mm) | 2.6 | % | |
| | #16 (1.18mm) | 2.2 | % | |
| | #30 (.6mm) | 2.1 | % | |
| | #50 (.3mm) | 2.0 | % | |
| | #100 (.15mm) | 1.8 | % | |
| | #200 (75µm) | 1.41 | % | |
| | Wash Loss (#200/75um) | 1.1 | % | 0-2 |
| | Total Moisture | 2.15 | % | |



Plant S12-Onsite Southfield

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 26A 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) | 95.8 | % | 95-100 |
| | 3/8" (9.5mm) | 88.0 | % | 60-95 |
| | #4 (4.75mm) | 28.4 | % | 5-30 |
| | #8 (2.36mm) | 7.9 | % | 0-12 |
| | #16 (1.18mm) | 3.7 | % | |
| | #30 (.6mm) | 2.8 | % | |
| | #50 (.3mm) | 2.4 | % | |
| | #100 (.15mm) | 2.1 | % | |
| | #200 (75µm) | 1.9 | % | |
| | Wash Loss (#200/75µm) | 1.8 | % | 0-3 |
| | Total Moisture | 2.55 | % | |



Plant S12-Onsite Southfield

Product 1022-2NS GR

Period: 08/27/2023 - 09/02/2023

Name/Title Doug Storey / QC Technician

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 2NS GR Spec |
|-----------|-----------------------|--------|------|-------------|
| | 3/8" (9.5mm) | 100.0 | % | 100-100 |
| | #4 (4.75mm) | 96.8 | % | 95-100 |
| | #8 (2.36mm) | 82.9 | % | 65-95 |
| | #16 (1.18mm) | 68.2 | % | 35-75 |
| | #30 (.6mm) | 50.9 | % | 20-55 |
| | #50 (.3mm) | 25.2 | % | 10-30 |
| | #100 (.15mm) | 5.4 | % | 0-10 |
| | #200 (75µm) | 0.9 | % | |
| | FM | 2.71 | | 2.6-3 |
| | Wash Loss (#200/75um) | 0.7 | % | 0-3 |
| | Total Moisture | 3.21 | % | |

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-32**

Sample Date: **8/28/23**

Dates Test Represents: **8/29/2023** through **9/4/2023**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____

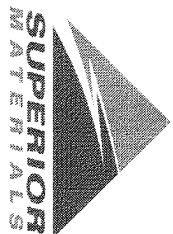
| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | Contribution % |
|------------|--------|--------------|--------------|-----------------|------------------|----------------|
| 6AA | 71-47 | Presque Isle | 1455 | 8.90 | 2.62 | 50.1 |
| 26A | 71-47 | Presque Isle | 300 | 1.83 |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

<----- 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" | 97.0 | 100.0 | 100.0 | 98.5 | 1.5 | 1.5 |
| 3/4" | 85.9 | 100.0 | 100.0 | 92.9 | 5.6 | 7.1 |
| 1/2" | 46.5 | 95.5 | 100.0 | 72.7 | 20.2 | 27.3 |
| 3/8" | 29.3 | 85.0 | 100.0 | 63.0 | 9.7 | 37.0 |
| #4 | 6.8 | 23.6 | 96.9 | 44.2 | 18.8 | 55.8 |
| #8 | 3.5 | 6.4 | 86.2 | 36.5 | 7.7 | 63.5 |
| #16 | 3.0 | 3.3 | 71.4 | 30.1 | 6.4 | 69.9 |
| #30 | 2.7 | 2.6 | 51.2 | 21.9 | 8.2 | 78.1 |
| #50 | 2.6 | 2.3 | 24.3 | 11.2 | 10.7 | 88.8 |
| #100 | 2.4 | 2.1 | 7.5 | 4.4 | 6.8 | 95.6 |
| LBW | 1.8 | 1.9 | 1.5 | 1.7 | 2.7 | 98.3 |

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

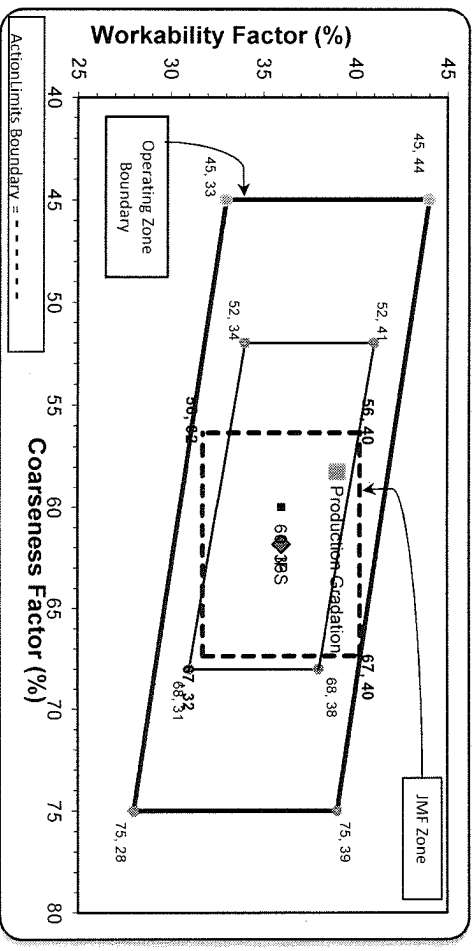
Superior Materials, LLC
 30701 W. 10 Mile Rd.
 Suite 500
 Farmington Hills, MI 48336



Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **58** Workability Factor: **37** Adjusted WF: **39.0**

Initial Production Sample (IPS)
 Coarseness Factor: **62**
 Workability Factor: **36**



| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
|-------|----------------------|------------|-----------------------|
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 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: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 6AA LS PI Spec |
|-----------|-----------------------|--------|------|----------------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | 100-100 |
| | 1" (25mm) | 97.0 | % | 95-100 |
| | 3/4" (19mm) | 85.9 | % | |
| | 1/2" (12.5mm) | 46.5 | % | 30-60 |
| | 3/8" (9.5mm) | 29.3 | % | |
| | #4 (4.75mm) | 6.8 | % | 0-8 |
| | #8 (2.36mm) | 3.5 | % | |
| | #16 (1.18mm) | 3.0 | % | |
| | #30 (.6mm) | 2.7 | % | |
| | #50 (.3mm) | 2.6 | % | |
| | #100 (.15mm) | 2.4 | % | |
| | #200 (75µm) | 2.1 | % | |
| | Wash Loss (#200/75um) | 1.8 | % | 0-2 |
| | Total Moisture | 3.0 | % | |

Plant 958-JMT

Product 1067-26A Mod LS

Name/Title Doug Storey / QC Technician

Period: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| 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) | 95.5 | % | 95-100 |
| | 3/8" (9.5mm) | 85.0 | % | 60-95 |
| | #4 (4.75mm) | 23.6 | % | 5-30 |
| | #8 (2.36mm) | 6.4 | % | 0-12 |
| | #16 (1.18mm) | 3.3 | % | |
| | #30 (.6mm) | 2.6 | % | |
| | #50 (.3mm) | 2.3 | % | |
| | #100 (.15mm) | 2.1 | % | |
| | #200 (75µm) | 2.0 | % | |
| | Wash Loss (#200/75um) | 1.9 | % | 0-3 |
| | Total Moisture | 2.5 | % | |

Plant 958-JMT

Product 1022-2NS GR - Smelter Bay

Name/Title Doug Storey / QC Technician

Period: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 2NS GR Spec |
|-----------|-----------------------|--------|------|-------------|
| | 3/8" (9.5mm) | 100.0 | % | 100-100 |
| | #4 (4.75mm) | 96.9 | % | 95-100 |
| | #8 (2.36mm) | 86.2 | % | 65-95 |
| | #16 (1.18mm) | 71.4 | % | 35-75 |
| | #30 (.6mm) | 51.2 | % | 20-55 |
| | #50 (.3mm) | 24.3 | % | 10-30 |
| | #100 (.15mm) | 7.5 | % | 0-10 |
| | #200 (75µm) | 2.0 | % | |
| | FM | 2.62 | | 2.6-3 |
| | Wash Loss (#200/75um) | 1.5 | % | 0-3 |
| | Total Moisture | 4.1 | % | |

Aggregate Optimization Chart

Production Gradation Report

PLANT #: **P-102**

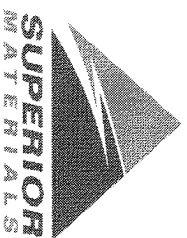
Sample Date: **8/28/23**

Dates Test Represents: **8/29/2023** through **9/4/2023**

Concrete Grade: **DM, 4500HP**

Contractor: _____

MDOT No.: _____



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

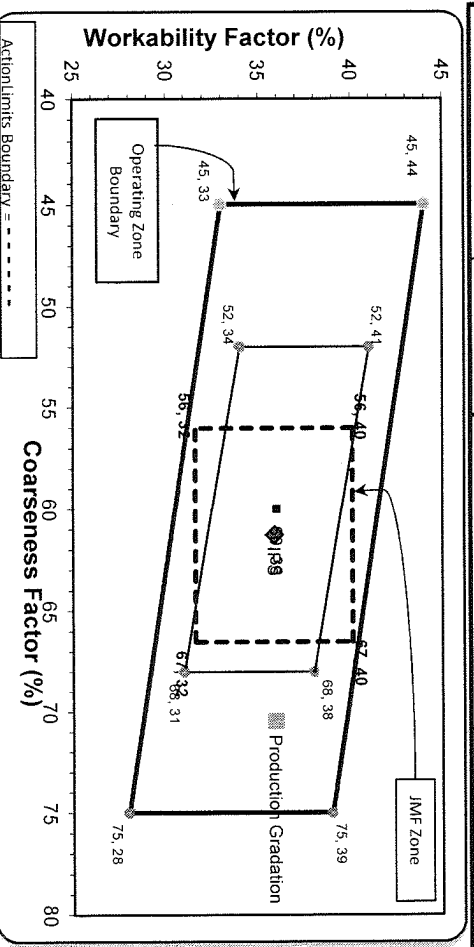
| Aggr. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | Contribution % |
|-------------|--------|---------------|-----------------|-----------------|------------------|----------------|
| 6AA | 58-003 | Stoneco | 1525 | 9.09 | 2.69 | 51.7 |
| 26A | 58-003 | Stoneco | 275 | 1.64 | 2.69 | 9.3 |
| ZNS | 81-019 | Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |
| | | | Total Wt | 2950 | 17.68 | 100.0 |

| Sieve | 6AA | 26A | ZNS | 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" | 98.2 | 100.0 | 100.0 | 99.1 | 0.9 | 0.9 |
| 3/4" | 73.2 | 100.0 | 100.0 | 86.1 | 12.9 | 13.9 |
| 1/2" | 28.2 | 99.1 | 100.0 | 62.8 | 23.3 | 37.2 |
| 3/8" | 11.5 | 87.4 | 100.0 | 53.1 | 9.7 | 46.9 |
| #4 | 2.6 | 11.3 | 97.8 | 40.5 | 12.6 | 59.5 |
| #8 | 1.8 | 3.8 | 82.4 | 33.4 | 7.1 | 66.6 |
| #16 | 1.6 | 2.8 | 64.2 | 26.1 | 7.3 | 73.9 |
| #30 | 1.5 | 2.5 | 45.9 | 18.9 | 7.2 | 81.1 |
| #50 | 1.4 | 2.3 | 22.5 | 9.7 | 9.2 | 90.3 |
| #100 | 1.3 | 2.2 | 4.2 | 2.5 | 7.2 | 97.5 |
| LBW | 1.1 | 2.0 | 0.2 | 0.8 | 1.7 | 99.2 |

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

Production Gradation Batch Plant Gradations Aggregate Supplier Gradations

Coarseness Factor: **70** Workability Factor: **33** Adjusted WF: **35.9**



| Sieve | Initial Production Sample (IPS) | Coarseness Factor: | Workability Factor: | Adjusted WF |
|-------|---------------------------------|--------------------|---------------------|-------------|
| 2" | 100.0 | 61 | 36 | 35.9 |
| 1.5" | 100.0 | 0.0 | 0.0 | 0.0 |
| 1" | 99.3 | 0.7 | 0.7 | 0.7 |
| 3/4" | 89.2 | 10.1 | 10.8 | 10.8 |
| 1/2" | 70.7 | 18.5 | 29.3 | 29.3 |
| 3/8" | 60.7 | 10.0 | 39.3 | 39.3 |
| #4 | 44.4 | 16.3 | 55.6 | 55.6 |
| #8 | 35.9 | 8.5 | 64.1 | 64.1 |
| #16 | 27.3 | 8.6 | 72.7 | 72.7 |
| #30 | 19.1 | 8.2 | 80.9 | 80.9 |
| #50 | 7.4 | 11.7 | 92.6 | 92.6 |
| #100 | 1.9 | 5.6 | 98.1 | 98.1 |
| LBW | 0.7 | 1.2 | 99.3 | 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: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 6AA LS |
|-----------|-----------------------|--------|------|---------|
| | 2" (50mm) | 100.0 | % | |
| | 1 1/2" (37.5mm) | 100.0 | % | 100-100 |
| | 1" (25mm) | 98.2 | % | 95-100 |
| | 3/4" (19mm) | 73.2 | % | |
| | 1/2" (12.5mm) | 28.2 | % | 30-60 |
| | 3/8" (9.5mm) | 11.5 | % | |
| | #4 (4.75mm) | 2.6 | % | 0-8 |
| | #8 (2.36mm) | 1.8 | % | |
| | #16 (1.18mm) | 1.6 | % | |
| | #30 (.6mm) | 1.5 | % | |
| | #50 (.3mm) | 1.4 | % | |
| | #100 (.15mm) | 1.3 | % | |
| | #200 (75µm) | 1.18 | % | |
| | Wash Loss (#200/75um) | 1.1 | % | 0-2 |
| | Total Moisture | 2.77 | % | |



Plant S102-Superior Novi
 Product 1067-26A Mod LS
 Period: 08/27/2023 - 09/02/2023

Name/Title Doug Storey / QC Technician
 Report Date 09/02/2023

| 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) | 87.4 | % | 60-95 |
| | #4 (4.75mm) | 11.3 | % | 5-30 |
| | #8 (2.36mm) | 3.8 | % | 0-12 |
| | #16 (1.18mm) | 2.8 | % | |
| | #30 (.6mm) | 2.5 | % | |
| | #50 (.3mm) | 2.3 | % | |
| | #100 (.15mm) | 2.2 | % | |
| | #200 (75µm) | 2.1 | % | |
| | Wash Loss (#200/75um) | 2.0 | % | 0-3 |
| | Total Moisture | 3.65 | % | |



Plant S102-Superior Novi

Product 1022-2NS GR

Name/Title Doug Storey / QC Technician

Period: 08/27/2023 - 09/02/2023

Report Date 09/02/2023

| Procedure | Sieve/Test | Result | Unit | 2NS GR Spec |
|-----------|-----------------------|--------|------|-------------|
| | 3/8" (9.5mm) | 100.0 | % | 100-100 |
| | #4 (4.75mm) | 97.8 | % | 95-100 |
| | #8 (2.36mm) | 82.4 | % | 65-95 |
| | #16 (1.18mm) | 64.2 | % | 35-75 |
| | #30 (.6mm) | 45.9 | % | 20-55 |
| | #50 (.3mm) | 22.5 | % | 10-30 |
| | #100 (.15mm) | 4.2 | % | 0-10 |
| | #200 (75µm) | 0.4 | % | |
| | FM | 2.83 | | 2.6-3 |
| | Wash Loss (#200/75um) | 0.2 | % | 0-3 |
| | Total Moisture | 3.45 | % | |