Aggregate Optimization Chart

Production Gradation Report

PLANT #: P-101 Contractor:

Sample Date: 5/8/23 Concrete Grade: DM, 4500HP Dates Test Represents: 5/9/2023 5/15/2023 MDOT No.: through

| Agg. Class | Pit# | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|------------|--------|--------------|--------------|-----------------|---------------------|-------------------|
| 6AA | 71-47 | Presque Isle | 1450 | 8.87 | 2.62 | 50.0 |
| 26A | 71-47 | Presque Isle | 300 | 1.83 | 2.62 | 10.3 |
| 2NS | 75-051 | Mid Michigan | 1150 | 6.93 | 2.66 | 39.7 |
| | | Total Wt | 2900 | 17.63 | | 100.0 |



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

| | Total Wt | 2900 17.63 | | 100.0 | < Verify this n | umber 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" | 98.8 | 100.0 | 100.0 | 99.4 | 0.6 | 0.6 |
| 3/4" | 80.2 | 100.0 | 100.0 | 90.1 | 9.3 | 9.9 |
| 1/2" | 33.4 | 96.7 | 100.0 | 66.4 | 23.7 | 33.6 |
| 3/8" | 19.8 | 88.0 | 100.0 | 58.7 | 7.7 | 41.3 |
| #4 | 4.2 | 21.6 | 97.2 | 42.9 | 15.8 | 57.1 |
| #8 | 2.1 | 5.2 | 81.8 | 34.0 | 8.9 | 66.0 r |
| #16 | 1.8 | 3.0 | 65.7 | 27.3 | 6.8 | 72.7 |
| #30 | 1.7 | 2.6 | 47.8 | 20.1 | 7.2 | 79.9 r |
| #50 | 1.7 | 2.5 | 21.9 | 9.8 | 10.3 | 90.2 |
| #100 | 1.6 | 2.3 | 5.2 | 3.1 | 6.7 | 96.9 |
| LBW | 1.4 | 2.1 | 0.8 | 1.2 | 1.9 | 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 Gra | dations | ns | Adjusted WF | Initial Produc | tion Sample (IPS | (|
|-------------------------|-----------------|---|-------------|-------------|------------------|------------------|---|
| Coarseness Factor: | 63 | Workability Factor: | 34 | 36.5 | Coarseness Facto | | |
| 45 | | | | | Worl | kability Factor: | |
| 45, 44 | | | JMF Zone | 7 I I | Sieve | Cumulative | _ |
|], | | | JIVII ZOIIC | - | Sieve | % Passing | F |
| 10 | 52, 41 | | | - 11 | 2" | 100.0 | |
| 3 40 1 | | 57, 39 67, 39 68, 38 | 75, 39 | - 11 | 1.5" | 100.0 | |
| ိ | | | | - 11 | 1" | 100.0 | |
| Factor 35 | | ■ 60, 36 Production Gradation | | - 11 | 3/4" | 95.0 | |
| 교 35 - | | i IPS | | - 11 | 1/2" | 70.5 | |
| 1 / | 52, 34 | -! | | - 11 | 3/8" | 60.0 | |
| Operating Zone Boundary | | | | - 11 | #4 | 44.4 | |
| □ 30 | | 57 , 31 67 ₆ 3 ,1 ₃₁ | | - 11 | #8 | 35.5 | |
| Operating Zone | | | | - 11 | #16 | 28.5 | |
| b Boundary | | | 75, 28 | - 11 | #30 | 21.5 | |
| > 25 | | | | | #50 | 10.2 | |
| 40 45 | 50 5 | 55 60 65 70 | 75 | 80 | #100 | 3.1 | |
| | | Coarseness Factor (%) | - | | LBW | 1.3 | |
| ActionLimits Boundary = | | | | | | | |

| Workability Factor: | | 35 | |
|---------------------|------------|----------|------------|
| Sieve | Cumulative | % | Cumulative |
| Sieve | % Passing | Retained | % 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" | 70.5 | 24.5 | 29.5 |
| 3/8" | 60.0 | 10.5 | 40.0 |
| #4 | 44.4 | 15.6 | 55.6 |
| #8 | 35.5 | 9.0 | 64.5 |
| #16 | 28.5 | 7.0 | 71.5 |
| #30 | 21.5 | 7.0 | 78.5 |
| #50 | 10.2 | 11.3 | 89.8 |
| #100 | 3.1 | 7.1 | 96.9 |
| LBW | 1.3 | 1.8 | 98.7 |

Sample Date:

Production Gradation

5/8/23 Concrete Grade: DM, 4500HP

| Dates Test F | Represents: | 5/9/2023 | through | 5/15/2023 | | |
|--------------|-------------|----------|--------------|-----------------|---------------------|-------------------|
| Agg. Class | Pit# | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
| 6AA | 58-003 | Stoneco | 1550 | 9.23 | 2.69 | 52.5 |

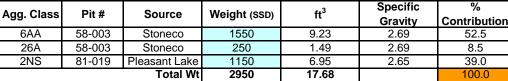
Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.4

MDOT No.:



<---- Verify this number is 100%

| SUP | ER | 10 | R |
|-----|----|----|---|

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

| | | 2000 | | | Tomy time mamber to ree /e | |
|-------|-------|-------|-------|-------------------------|----------------------------|-----------------------|
| 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" | 99.4 | 100.0 | 100.0 | 99.7 | 0.3 | 0.3 |
| 3/4" | 87.2 | 100.0 | 100.0 | 93.3 | 6.4 | 6.7 |
| 1/2" | 46.1 | 99.8 | 100.0 | 71.7 | 21.6 | 28.3 |
| 3/8" | 25.4 | 87.5 | 100.0 | 59.7 | 11.9 | 40.3 |
| #4 | 2.2 | 7.5 | 98.7 | 40.3 | 19.5 | 59.7 |
| #8 | 1.3 | 1.9 | 84.8 | 33.9 | 6.4 | 66.1 |
| #16 | 0.9 | 1.5 | 67.7 | 27.0 | 6.9 | 73.0 |
| #30 | 0.9 | 1.3 | 48.1 | 19.3 | 7.7 | 80.7 |
| #50 | 0.8 | 1.2 | 22.9 | 9.4 | 9.9 | 90.6 |
| #100 | 0.8 | 1.2 | 6.0 | 2.9 | 6.6 | 97.1 |
| I BW | 0.5 | 0.9 | 1.4 | 0.9 | 2.0 | 99 1 |

Aggregate Supplier Gradations

*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.

| Coarseness Factor: | 61 | Workability Factor: | 34 | |
|---|--------|-----------------------------------|--------|----|
| 45 45, 44 45, 44 45, 33 Operating Zone Boundary | 52, 34 | 68, 38 667 Seduction Gracation | 75, 39 | |
| 25 | 50 55 | Coarseness Factor (%) | 75 | 80 |

Batch Plant Gradations

| Work | ability Factor: | 36 | |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 99.3 | 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 |

PLANT #: P-103

Pit#

58-003

58-003

81-019

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

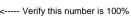
5/8/23 Concrete Grade: DM, 4500HP

5/9/2023

| 5/9/2023 | through | 5/15/2023 | | |
|---------------|--------------|-----------------|----------|--------------|
| Source | Weight (SSD) | ft ³ | Specific | % |
| Source | weight (SSD) | It | Gravity | Contribution |
| Stoneco | 1550 | 9.23 | 2.69 | 52.5 |
| Stoneco | 250 | 1.49 | 2.69 | 8.5 |
| Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |

Contractor:

MDOT No.:



| SUPERIOR MATERIALS |
|-----------------------|

Superior Materials, LLC 30701 W. 10 Mile Rd. 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.

| | | | | | < Verify this number is 100% | | |
|------------|-----|-----|-------|-------------------------|------------------------------|--------------------------|--|
| Sieve 6AA | 26 | 26A | | Cumulative % Passing | % Retained | Cumulative % Retained | |
| 2" 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1.5" 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1" 99.4 | 100 | 0.0 | 100.0 | 99.7 | 0.3 | 0.3 | |
| 3/4" 87.2 | 100 | 0.0 | 100.0 | 93.3 | 6.4 | 6.7 | |
| 1/2" 46.1 | 99. | .8 | 100.0 | 71.7 | 21.6 | 28.3 | |
| 3/8" 25.4 | 87. | .5 | 100.0 | 59.7 | 11.9 | 40.3 | |
| #4 2.2 | 7. | 5 | 98.7 | 40.3 | 19.5 | 59.7 | |
| #8 1.3 | 1.9 | 9 | 84.8 | 33.9 | 6.4 | 66.1 | |
| #16 0.9 | 1. | 5 | 67.7 | 27.0 | 6.9 | 73.0 | |
| #30 0.9 | 1.3 | 3 | 48.1 | 19.3 | 7.7 | 80.7 | |
| #50 0.8 | 1.3 | 2 | 22.9 | 9.4 | 9.9 | 90.6 | |
| #100 0.8 | 1.3 | 2 | 6.0 | 2.9 | 6.6 | 97.1 | |
| LBW 0.5 | 0.9 | 9 | 1.4 | 0.9 | 2.0 | 99.1 | |

| Production Gradation | ant Gradations | ations | Adjusted WF | Intial Producti | on Sample (IPS |) |
|-------------------------|--------------------------------|----------|-------------|-----------------|-----------------|---|
| Coarseness Factor: 61 | Workability Factor: | 34 | 36.4 | Coars | eness Factor: | |
| 45 | | | | Work | ability Factor: | |
| 45, 44 | | JMF Zone | 711 | Sieve | Cumulative | П |
| | | | - | Sieve | % Passing | F |
| 52, 41 | 56.40 | | - 11 | 2" | 100.0 | ĺ |
| (3) 40 1 | | 75, 39 | - 11 | 1.5" | 100.0 | |
| (%) | 68, 38 | T | - 11 | 1" | 99.3 | Ī |
| 6 | ■ 60 Reduction Gradation | | - 11 | 3/4" | 89.2 | П |
| Factor 1 52.34 | - oojes | | - 11 | 1/2" | 70.7 | П |
| 52, 34 | | | - 11 | 3/8" | 60.7 | |
| 45, 33 | | | - 11 | #4 | 44.4 | П |
| 30 | 56, 32 67, 3 2, 368, 31 | | | #8 | 35.9 | |
| Operating Zone Boundary | | | - 11 | #16 | 27.3 | П |
| Boundary | | 75, 28 | | #30 | 19.1 | |
| Š | | , | | #50 | 7.4 | |

Coarseness Factor (%) 60

75

80

| Work | ability Factor: | 36 | |
|-------|-----------------|----------|------------|
| Sieve | Cumulative | % | Cumulative |
| Sieve | % Passing | Retained | % Retained |
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 1" 99.3 | | 0.7 |
| 3/4" | 89.2 | 10.1 | 10.8 |
| 1/2" | 1/2" 70.7 | | 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

50

55

45

ActionLimits Boundary = - - - -

25

Approved BY:

PLANT #: Contractor:

5/8/23 Concrete Grade: DM, 4500HP Sample Date: Dates Test Represents: 5/9/2023 5/15/2023 through MDOT No.:

| Agg. Class | Pit# | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
|------------|--------|----------|--------------|-----------------|---------------------|-------------------|
| 6AA | 58-003 | Stoneco | 1560 | 9.29 | 2.69 | 52.7 |
| 26A | 58-003 | Stoneco | 300 | 1.79 | 2.69 | 10.1 |
| 2NS | 19-04 | Schlegel | 1100 | 6.60 | 2.67 | 37.2 |
| Total Wt | | | 2960 | 17.68 | | 100.0 |

Coarseness Factor:

| Builders Redi-Mix |
|----------------------|
| 30701 W. 10 Mile Rd. |
| 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.

63

*% Retained must be at least 8% for the 1" sieve when

a 2" max. size (nom. Max. 1.5") aggregate is used.

| | Total Wt | 2960 | 17.68 | | 100.0 | < Verify this n | umber is 100% |
|-------|----------|------|-------|-------|-------------------------|-----------------|-----------------------|
| Sieve | 6AA | 26 | A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 99.4 | 100 | 0.0 | 100.0 | 99.7 | 0.3 | 0.3 |
| 3/4" | 87.2 | 100 | 0.0 | 100.0 | 93.3 | 6.4 | 6.7 |
| 1/2" | 46.1 | 99 | .8 | 100.0 | 71.6 | 21.7 | 28.4 |
| 3/8" | 25.4 | 87 | .5 | 100.0 | 59.4 | 12.2 | 40.6 |
| #4 | 2.2 | 7. | 5 | 99.9 | 39.0 | 20.4 | 61.0 |
| #8 | 1.3 | 1. | 9 | 90.1 | 34.4 | 4.7 | 65.6 |
| #16 | 0.9 | 1. | 5 | 69.4 | 26.4 | 7.9 | 73.6 |
| #30 | 0.9 | 1. | 3 | 44.5 | 17.1 | 9.3 | 82.9 |
| #50 | 0.8 | 1. | 2 | 14.3 | 5.9 | 11.3 | 94.1 |
| #100 | 0.8 | 1. | 2 | 2.7 | 1.5 | 4.3 | 98.5 |
| LBW | 0.5 | 0. | 9 | 0.2 | 0.4 | 1.1 | 99.6 |
| | O 5 5 | | | | | | |

Batch Plant Gradations Aggregate Supplier Gradations **Production Gradation** Adjusted WF Intial Production Sample (IPS) **Coarseness Factor: Workability Factor:** 36.9 62 34 45 JMF Zone 45, 44 52, 4 75, 39

36 **Workability Factor:** % Cumulative Cumulative Sieve % Passing Retained % 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" 18.7 29.7 70.3 3/8' 10.4 59.9 40.1 #4 58.1 41.9 18.0 #8 35.9 6.0 64.1 #16 27.8 8.2 72.2 #30 18.9 8.8 81.1 93.7 #50 6.3 12.6 #100 1.7 4.6 98.3 LBW 99.0

Workability Factor (%) 68, 38 Production Gradation 60, 36PS 52, 34 45, 33 Operating Zone Boundary 75, 28 25 Coarseness Factor (%)⁷⁰ 45 50 55 75 80 ActionLimits Boundary = - - - - -

Aggregate Optimization Chart

5/8/23

PLANT #: 12

PREPARED BY:

Sample Date:

Concrete Grade: DM, 4500HP

MDOT No.:

Contractor:

Dates Test Represents: 5/9/2023 5/15/2023 through Specific ft³ Agg. Class Pit# Source Weight (SSD) Gravity Cont 6AA 71-47 Presque Isle 1655 10.12 2.62 26A 71-47 Presque Isle 100 0.61 2.62 3.4 2NS 63-115 Ray Rd 1150 6.95 2.65 39.6

| | IVIL |
|-----------|------|
| % | |
| tribution | |
| 57.0 | |
| 0.4 | |

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

| | Total Wt | 2905 | 17.69 | | 100.0 | < Verify this number is 100% | | |
|-----------|----------|------|-------|-------|-------------------------|------------------------------|-----------------------|--|
| Sieve 6AA | | 26A | | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained | |
| 2" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1.5" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1" | 98.6 | 10 | 0.0 | 100.0 | 99.2 | 0.8 | 0.8 | |
| 3/4" | 84.3 | 10 | 0.0 | 100.0 | 91.1 | 8.1 | 8.9 | |
| 1/2" | 49.6 | 95 | 5.1 | 100.0 | 71.1 | 19.9 | 28.9 | |
| 3/8" | 31.6 | 85 | 5.7 | 100.0 | 60.5 | 10.6 | 39.5 | |
| #4 | 5.2 | 15 | 5.4 | 96.4 | 41.7 | 18.9 | 58.3 | |
| #8 | 1.9 | 3 | .3 | 79.2 | 32.5 | 9.1 | 67.5 | |
| #16 | 1.5 | 1 | .7 | 63.4 | 26.0 | 6.5 | 74.0 | |
| #30 | 1.4 | 1 | .4 | 48.1 | 19.9 | 6.1 | 80.1 | |
| #50 | 1.3 | 1 | .3 | 25.4 | 10.8 | 9.0 | 89.2 | |
| #100 | 1.3 | 1 | .2 | 4.2 | 2.4 | 8.4 | 97.6 | |
| LBW | 1.0 | 0 | .8 | 0.5 | 0.8 | 1.6 | 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 | adations | Adjusted WF | Intial Producti | ion Sample (IPS) |
|---|---|--|-----------------|------------------|
| Coarseness Factor: 59 | Workability Factor: 33 | 35.0 | Coars | seness Factor: |
| 45 | | $\neg \top$ | Work | kability Factor: |
| 45, 44 | JMF Zon | <u>. </u> | Sieve | Cumulative |
| 52, 41 | 300 200 | <u>-</u> | Sieve | % Passing |
| 40] | 57, 40 68, 40 | | 2" | 100.0 |
| (| 75, 3 |) | 1.5" | 100.0 |
| | ! 7 | | 1" | 99.3 |
| Q | _ ■ 60, 36PS | | 3/4" | 89.0 |
| %) 35 35 52 34 52 | Production Gradation | - 11 | 1/2" | 70.3 |
| 3 02,01 | <u> </u> | - 11 | 3/8" | 59.9 |
| Operating Zone Boundary | 37-22 | - 11 | #4 | 41.9 |
| 2 30 | 37, 22 •68, 32 | | #8 | 35.9 |
| Operating Zone | | | #16 | 27.8 |
| Boundary | 75, 2 | 3 | #30 | 18.9 |
| > 25 | | | #50 | 6.3 |
| I | 5 60 65 70 75 | 80 | #100 | 1.7 |
| | ⁵ Coarseness Factor (%) ⁷⁰ 75 | 33 | LBW | 1.0 |
| ActionLimits Boundary = | | | | |

| Work | ability Factor: | 36 | |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 99.3 | 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 |

SM, LLC Technical Service

PLANT #: p11

Sample Date:

5/8/23 Concrete Grade: DM, 4500HP

| Dates Test Represents: | | 5/9/2023 | through | 5/15/2023 | | | |
|------------------------|------------|----------|--------------|--------------|-----------------|---------------------|-------------------|
| | 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 |

Contractor:

MDOT No.:



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

| | l otal Wt | 2905 | 17.69 | | 100.0 | < Verify this n | umber is 100% |
|-------|-----------|------|-------|-------|----------------------|-----------------|--------------------------|
| Sieve | 6AA | 26 | A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 97.4 | 100 | 0.0 | 100.0 | 98.7 | 1.3 | 1.3 |
| 3/4" | 82.4 | 100 | 0.0 | 100.0 | 91.2 | 7.5 | 8.8 |
| 1/2" | 43.6 | 95 | .1 | 100.0 | 71.2 | 19.9 | 28.8 |
| 3/8" | 24.3 | 85 | .7 | 100.0 | 60.6 | 10.6 | 39.4 |
| #4 | 3.2 | 15 | .4 | 96.6 | 41.4 | 19.2 | 58.6 |
| #8 | 1.4 | 3. | 3 | 84.1 | 34.3 | 7.1 | 65.7 |
| #16 | 1.1 | 1. | 7 | 68.6 | 27.9 | 6.5 | 72.1 |
| #30 | 1.0 | 1. | 4 | 48.6 | 19.9 | 8.0 | 80.1 |
| #50 | 1.0 | 1. | 3 | 22.8 | 9.7 | 10.2 | 90.3 |
| #100 | 0.9 | 1. | 2 | 6.5 | 3.1 | 6.5 | 96.9 |
| LBW | 0.8 | 0. | 8 | 1.5 | 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.

| Coarseness Factor: | 60 | Workability Factor: | 34 | 36.8 | Coars | seness Factor: |
|---------------------------------|--------|-------------------------------------|----------|---------|-------|----------------------|
| 45 | | | | $\neg $ | Worl | kability Factor: |
| 45, 44 | 52, 41 | | JMF Zone | | Sieve | Cumulative % Passing |
| _ 40 - | 56, 4 | 67, 40 | | - 11 | 2" | 100.0 |
| § ⁴⁰] | i | 68, 38 | 75, 39 | - 11 | 1.5" | 100.0 |
| | ! | Production Cradetion | | - 11 | 1" | 100.0 |
| 35 | | Production Gradation 60, 3BS | | | 3/4" | 95.0 |
| 35 - | _ | i l | | | 1/2" | 72.3 |
| 4 7 | 52, 34 | <u> </u> | | - 11 | 3/8" | 60.4 |
| 45, 33 | 50.9 | | | | #4 | 42.6 |
| 30 - | 33, 3. | 67 _{68,31} | | | #8 | 36.0 |
| Operating Zone | | | | | #16 | 29.5 |
| 30 - Operating Zone Boundary | | | 75, 28 | | #30 | 20.3 |
| 25 | | | | | #50 | 9.5 |
| 40 45 | 50 55 | 60 65 70 | 75 | 80 | #100 | 3.4 |
| | | Coarseness Factor (%) ⁷⁰ | | •• | LBW | 1.3 |

| Work | ability Factor: | 36 | |
|-------|-----------------|----------|------------|
| Sieve | Cumulative | % | Cumulative |
| Sieve | % Passing | Retained | % 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 |

62

PLANT #:

Production Gradation

| Sample Date: | 5/8/23 | | Concrete Grade: DM, 450 | 0H |
|------------------------|----------|---------|-------------------------|----|
| Dates Test Represents: | 5/9/2023 | through | 5/15/2023 | |

| Batoo 1 oot 1 | toproconto. | 0/0/2020 | unougn | 0/10/2020 | | |
|---------------|-------------|--------------|--------------|-----------------|---------------------|-------------------|
| 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 | 2005 | 17 60 | | 100.0 |

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.8



Superior Materials, LLC

30701 W. 10 Mile Rd. Suite 500

Farmington Hills, MI 48336

| | Total Wt | 2905 | 17.69 | | 100.0 | < Verify this n | umber is 100% | |
|-------|----------|------|------------|-------|-------------------------|-----------------|--------------------------|-----|
| Sieve | 6AA | 26 | 6 A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained | |
| 2" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1.5" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1" | 97.4 | 10 | 0.0 | 100.0 | 98.7 | 1.3 | 1.3 | |
| 3/4" | 82.4 | 10 | 0.0 | 100.0 | 91.2 | 7.5 | 8.8 | |
| 1/2" | 43.6 | 95 | 5.1 | 100.0 | 71.2 | 19.9 | 28.8 | |
| 3/8" | 24.3 | 85 | 5.7 | 100.0 | 60.6 | 10.6 | 39.4 | * |
| #4 | 3.2 | 15 | 5.4 | 96.6 | 41.4 | 19.2 | 58.6 | *, |
| #8 | 1.4 | 3 | .3 | 84.1 | 34.3 | 7.1 | 65.7 | no |
| #16 | 1.1 | 1. | .7 | 68.6 | 27.9 | 6.5 | 72.1 | *(|
| #30 | 1.0 | 1. | .4 | 48.6 | 19.9 | 8.0 | 80.1 | no |
| #50 | 1.0 | 1. | .3 | 22.8 | 9.7 | 10.2 | 90.3 | *(|
| #100 | 0.9 | 1. | .2 | 6.5 | 3.1 | 6.5 | 96.9 | a 2 |
| LBW | 0.8 | 0. | .8 | 1.5 | 1.1 | 2.1 | 98.9 | 1 |

Aggregate Supplier Gradations

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

om. max., #100 and #200 sieves.

*% Retained must be at least 4% for each sieve except max.,

om. max., #100 and #200 sieves.

*% Retained must be at least 8% for the 1" sieve when

2" max. size (nom. Max. 1.5") aggregate is used.

| Coarseness Factor: | 60 | Workability Factor: | 34 | |
|---|--------|---------------------------------------|-----------------|----|
| 45 45, 44 | 52, 41 | 68, 38 Production Gradation 60, 3BS | JMF Zone 75, 39 | |
| Morkability Factor (%) 35 Application 200 Operating Zone Boundary | 52, 34 | 67 _{68,31} | 75, 28 | |
| 40 45 ActionLimits Boundary = | 50 5 | Coarseness Factor (%) | 75 | 80 |

Batch Plant Gradations

| Work | ability 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 |

Sample Date:

Production Gradation

5/8/23 Concrete Grade: DM, 4500HP

5/9/2023 5/15/2023 through

| Dates Test F | Represents: | 5/9/2023 | through | 5/15/2023 | | |
|--------------|-------------|---------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
| 6AA | 58-003 | Stoneco | 1550 | 9.23 | 2.69 | 52.5 |
| 26A | 58-003 | Stoneco | 250 | 1.49 | 2.69 | 8.5 |
| 2NS | 81-019 | Pleasant Lake | 1150 | 6.95 | 2.65 | 39.0 |
| | | Total Wt | 2950 | 17.68 | | 100.0 |

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.4



---- Verify this number is 100%

| Cumulative % Retained | <u>Superior Materials, LLC</u> 30701 W. 10 Mile Rd. |
|-----------------------|--|
| 0.0 | Suite 500 |
| 0.0 | Farmington Hills, MI 48336 |

Cumulative 6AA 26A % Retained Sieve 2NS % Passing 2" 100.0 100.0 100.0 100.0 0.0 1.5" 100.0 100.0 100.0 100.0 0.0 99.7 99.4 100.0 100.0 0.3 0.3 3/4" 87.2 100.0 100.0 93.3 6.4 6.7 1/2' 46.1 99.8 100.0 71.7 21.6 28.3 3/8' 87.5 100.0 59.7 11.9 40.3 25.4 19.5 #4 2.2 7.5 98.7 40.3 59.7 #8 1.3 1.9 84.8 33.9 6.4 66.1 #16 0.9 1.5 67.7 27.0 6.9 73.0 #30 0.9 19.3 80.7 1.3 48.1 7.7 #50 0.8 1.2 22.9 9.4 9.9 90.6 #100 2.9 0.8 1.2 6.0 6.6 97.1 LBW 2.0 0.5 0.9 0.9

Aggregate Supplier Gradations

*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.

| Coarseness Facto | or: 61 | Workability Factor: | 34 | |
|--|--------|------------------------------------|----------|----------|
| 45 45, 44 | 52, 41 | | JMF Zone | |
| -actor (%) | 50 | 68, 38 | 75, 39 | |
| Morkability Factor (%) 35 - 45, 33 Operating Z Boundar | one | , 31 67, 34 , 31 | 75, 28 | |
| 25 1 40 45 ActionLimits Boundary = - | | ⁵ Coarseness Factor (%) | 75 | 80 80 |

Batch Plant Gradations

| Work | ability Factor: | 36 | |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 99.3 | 0.7 | 0.7 |
| 3/4" | 89.1 | 10.2 | 10.9 |
| 1/2" | 70.5 | 18.6 | 29.5 |
| 3/8" | 60.5 | 10.0 | 39.5 |
| #4 | 44.1 | 16.4 | 55.9 |
| #8 | 35.6 | 8.5 | 64.4 |
| #16 | 27.7 | 7.9 | 72.3 |
| #30 | 20.6 | 7.1 | 79.4 |
| #50 | 8.7 | 11.8 | 91.3 |
| #100 | 1.6 | 7.1 | 98.4 |
| LBW | 1.1 | 0.6 | 98.9 |

45, 44

45, 33

Operating Zone Boundary

45

ActionLimits Boundary = - - - - -

Workability Factor (%)

25

Sample Date:

5/8/23 Concrete Grade: DM, 4500HP

| Dates Test Represents: | | 5/9/2023 | through | 5/15/2023 | | |
|------------------------|-------|--------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class | Pit# | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
| 6AA | 71-47 | Presque Isle | 1655 | 10.12 | 2.62 | 57.0 |
| 26A | 71-47 | Presque Isle | 100 | 0.61 | 2.62 | 3.4 |
| 2NS | 63-92 | Grange Hall | 1150 | 6.95 | 2.65 | 39.6 |

Contractor:

MDOT No.:



| Superior Materials, LLC |
|-------------------------|
| 30701 W. 10 Mile Rd. |
| Suite 500 |
| F |

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.

63

*% Retained must be at least 8% for the 1" sieve when

a 2" max. size (nom. Max. 1.5") aggregate is used.

| • | Total Wt | 2905 | 17.69 | | 100.0 | < Verify this n | umber is 100% |
|-------|----------|------|----------|-------|-------------------------|-----------------|--------------------------|
| Sieve | 6AA | 26 | A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 98.6 | 10 | 0.0 | 100.0 | 99.2 | 0.8 | 0.8 |
| 3/4" | 84.3 | 10 | 0.0 | 100.0 | 91.1 | 8.1 | 8.9 |
| 1/2" | 49.6 | 95 | 5.1 | 100.0 | 71.1 | 19.9 | 28.9 |
| 3/8" | 31.6 | 85 | 5.7 | 100.0 | 60.5 | 10.6 | 39.5 |
| #4 | 5.2 | 15 | 5.4 | 97.2 | 42.0 | 18.6 | 58.0 |
| #8 | 1.9 | 3 | 3 | 83.1 | 34.1 | 7.9 | 65.9 |
| #16 | 1.5 | 1 | .7 | 66.3 | 27.2 | 6.9 | 72.8 |
| #30 | 1.4 | 1 | 4 | 43.1 | 17.9 | 9.3 | 82.1 |
| #50 | 1.3 | 1 | .3 | 17.0 | 7.5 | 10.4 | 92.5 |
| #100 | 1.3 | 1 | 2 | 3.4 | 2.1 | 5.4 | 97.9 |
| LBW | 1.0 | 0 | .8 | 0.6 | 0.8 | 1.3 | 99.2 |

 Batch Plant Gradations Aggregate Supplier Gradations **Production Gradation** Adjusted WF Intial Production Sample (IPS) **Coarseness Factor: Workability Factor:** 34 36.6 Coarseness Factor: 60 **Workability Factor:** 45

Production Gradati

JMF Zone Coarseness Factor (%) 70 75 80

| Sieve | Cumulative | % | Cumulative |
|-------|------------|----------|------------|
| Sieve | % Passing | Retained | % 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" | 90.3 | 8.8 | 9.7 |
| 1/2" | 69.2 | 21.1 | 30.8 |
| 3/8" | 59.1 | 10.1 | 40.9 |
| #4 | 41.8 | 17.3 | 58.2 |
| #8 | 35.1 | 6.6 | 64.9 |
| #16 | 28.5 | 6.6 | 71.5 |
| #30 | 21.2 | 7.3 | 78.8 |
| #50 | 8.7 | 12.5 | 91.3 |
| #100 | 1.8 | 7.0 | 98.2 |
| LBW | 0.7 | 1.0 | 99.3 |

PREPARED BY: SM, LLC Technical Service

52, 34

50

55

5/9/2023

Source

Stoneco

Stoneco

Pleasant Lake

Total Wt

Batch Plant Gradations

250

1150

2950

PLANT #: P-38

Pit#

58-003

58-003

81-019

Sample Date:

Agg. Class

6AA

26A

2NS

Dates Test Represents:

Production Gradation

5/8/23 Concrete Grade: **DM**, **4500HP**

1.49

6.95

17.68

 through
 5/15/2023

 Weight (ssp)
 ft³
 Specific Gravity
 % Contribution

 1550
 9.23
 2.69
 52.5

2.69

2.65

MDOT No.:

Contractor:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.4



<---- Verify this number is 100%

| M | A | T | E | R | / | A | L | S | |
|-----|------|-----|-----|-----|-----|------|----|------------|--|
| Su | pei | io | r N | 1at | eı | rial | s, | <u>LLC</u> | |
| 307 | 701 | W | . 1 | 0 N | 1il | e R | d. | | |
| Sui | te ! | 500 |) | | | | | | |

Farmington Hills, MI 48336

| | . • • • • • • • • • • • • • • • • • • • | | | 100.0 | · voing and in | di 11001 10 10070 |
|-------|---|-------|-------|-------------------------|----------------|--------------------------|
| 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" | 99.4 | 100.0 | 100.0 | 99.7 | 0.3 | 0.3 |
| 3/4" | 87.2 | 100.0 | 100.0 | 93.3 | 6.4 | 6.7 |
| 1/2" | 46.1 | 99.8 | 100.0 | 71.7 | 21.6 | 28.3 |
| 3/8" | 25.4 | 87.5 | 100.0 | 59.7 | 11.9 | 40.3 |
| #4 | 2.2 | 7.5 | 98.7 | 40.3 | 19.5 | 59.7 |
| #8 | 1.3 | 1.9 | 84.8 | 33.9 | 6.4 | 66.1 r |
| #16 | 0.9 | 1.5 | 67.7 | 27.0 | 6.9 | 73.0 |
| #30 | 0.9 | 1.3 | 48.1 | 19.3 | 7.7 | 80.7 r |
| #50 | 0.8 | 1.2 | 22.9 | 9.4 | 9.9 | 90.6 |
| #100 | 0.8 | 1.2 | 6.0 | 2.9 | 6.6 | 97.1 a |
| LBW | 0.5 | 0.9 | 1.4 | 0.9 | 2.0 | 99.1 |

Aggregate Supplier Gradations

*Maximum % Retained must be above the 3/8" sieve.

*Any two adjacent sieves must equal 10% except max.,

nom. max., #100 and #200 sieves.

 $\ensuremath{^{*}\%}$ 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.

| Coarseness Factor: | 61 | Workability Factor: | 34 | |
|---|--------|--|--------|----------|
| 45 45, 44 45, 44 45, 33 Operating Zone Boundary | 52, 34 | 68, 38 60 Production Gradation 67, 30 31 | 75, 28 | |
| 25 40 45 ActionLimits Boundary = | 50 | Coarseness Factor (%) ⁷⁰ | 75 | 80 80 |

| Work | ability Factor: | 36 | |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 0.0 | 0.0 |
| 1" | 99.3 | 0.7 | 0.7 |
| 3/4" | 89.1 | 10.2 | 10.9 |
| 1/2" | 70.5 | 18.6 | 29.5 |
| 3/8" | 60.5 | 10.0 | 39.5 |
| #4 | 44.1 | 16.4 | 55.9 |
| #8 | 35.6 | 8.5 | 64.4 |
| #16 | 27.7 | 7.9 | 72.3 |
| #30 | 20.6 | 7.1 | 79.4 |
| #50 | 8.7 | 11.8 | 91.3 |
| #100 | 1.6 | 7.1 | 98.4 |
| LBW | 1.1 | 0.6 | 98.9 |

PREPARED BY: SM, LLC Technical Service Approved By

Sample Date:

Production Gradation

5/8/23 Concrete Grade: DM, 4500HP

| Dates Test Represents: | | 5/9/2023 | tnrougn | 5/15/2023 | | |
|------------------------|--------|-----------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class | Pit # | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
| 6AA | 71-47 | Presque Isle | 1555 | 9.51 | 2.62 | 53.5 |
| 26A | 71-47 | Presque Isle | 250 | 1.53 | 2.62 | 8.6 |
| 2NS | 44-051 | Krake Willis Rd | 1100 | 6.65 | 2.65 | 37.9 |

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

35.8



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

| Total Wt | | Total Wt 2905 17.69 | | | 100.0 | < Verify this number is 100% | | |
|----------|-------|---------------------|-----|-------|----------------------|------------------------------|--------------------------|--|
| Sieve | 6AA | 26 | 6A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained | |
| 2" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1.5" | 100.0 | 10 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 | |
| 1" | 98.8 | 10 | 0.0 | 100.0 | 99.4 | 0.6 | 0.6 | |
| 3/4" | 80.2 | 10 | 0.0 | 100.0 | 89.4 | 10.0 | 10.6 | |
| 1/2" | 33.4 | 96 | 6.7 | 100.0 | 64.1 | 25.3 | 35.9 | |
| 3/8" | 19.8 | 88 | 3.0 | 100.0 | 56.0 | 8.0 | 44.0 | |
| #4 | 4.2 | 21 | .6 | 97.0 | 40.8 | 15.2 | 59.2 | |
| #8 | 2.1 | 5 | .2 | 83.8 | 33.3 | 7.5 | 66.7 | |
| #16 | 1.8 | 3 | .0 | 68.6 | 27.2 | 6.1 | 72.8 | |
| #30 | 1.7 | 2 | .6 | 50.2 | 20.1 | 7.1 | 79.9 | |
| #50 | 1.7 | 2 | .5 | 22.4 | 9.6 | 10.5 | 90.4 | |
| #100 | 1.6 | 2 | .3 | 5.4 | 3.1 | 6.5 | 96.9 | |
| LBW | 1.4 | 2 | .1 | 1.0 | 1.3 | 1.8 | 98.7 | |
| | | | | | | | | |

Aggregate Supplier Gradations

*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.

63

*% Retained must be at least 8% for the 1" sieve when

a 2" max. size (nom. Max. 1.5") aggregate is used.

| 45 45, 44 52, 41 56, 40 68, 38 75, 39 68, 38 75, 39 68, 38 75, 22 68, 32 75, 28 | Coarseness Factor: | 66 | Workability Factor: | 33 | |
|--|---|------|--|--------|----|
| 40 45 50 55 60 65 70 75 80 Coarseness Factor (%) | Morkability Factor (%) 40 45, 44 45, 33 Operating Zone Boundary | | 68, 38 ■ 60, 36 _{IPS} ■ Production G | 75, 39 | |
| ActionLimits Boundary = | | 50 5 | 5 Coarseness Factor (%) ⁷⁰ | 75 | 80 |

Batch Plant Gradations

| Work | ability 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" | 89.7 | 10.3 | 10.3 |
| 1/2" | 70.3 | 19.4 | 29.7 |
| 3/8" | 59.1 | 11.2 | 40.9 |
| #4 | 42.8 | 16.3 | 57.2 |
| #8 | 35.5 | 7.3 | 64.5 |
| #16 | 29.0 | 6.5 | 71.0 |
| #30 | 21.2 | 7.7 | 78.8 |
| #50 | 9.8 | 11.5 | 90.2 |
| #100 | 3.7 | 6.1 | 96.3 |
| LBW | 1.2 | 2.5 | 98.8 |

Sample Date:

5/8/23 Concrete Grade: DM, 4500HP

| Dates Test F | Represents: | 5/9/2023 | through | 5/15/2023 | | |
|--------------|-------------|--------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class | Pit# | Source | Weight (SSD) | ft ³ | Specific Gravity | % Contribution |
| 6AA | 71-47 | Presque Isle | 1655 | 10.12 | 2.62 | 57.0 |
| 26A | 71-47 | Presque Isle | 100 | 0.61 | 2.62 | 3.4 |
| 2NS | 63-115 | Ray Rd | 1150 | 6.95 | 2.65 | 39.6 |

Contractor:

MDOT No.:

Coarseness Factor:

35.0

| SUPERIOR MATERIALS |
|-----------------------|

Superior Materials, LLC 30701 W. 10 Mile Rd. 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.

| - | Total Wt | 2905 | 17.69 | | 100.0 | < Verify this n | umber is 100% |
|--------------|-------------------------------|--------|-------------------|---------|----------------------|-------------------|--------------------------|
| Sieve | 6AA | 26 | A | 2NS | Cumulative % Passing | % Retained | Cumulative % Retained |
| 2" | 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1.5" | 100.0 | 100 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 1" | 98.6 | 100 | 0.0 | 100.0 | 99.2 | 0.8 | 0.8 |
| 3/4" | 84.3 | 100 | 0.0 | 100.0 | 91.1 | 8.1 | 8.9 |
| 1/2" | 49.6 | 95 | .1 | 100.0 | 71.1 | 19.9 | 28.9 |
| 3/8" | 31.6 | 85 | .7 | 100.0 | 60.5 | 10.6 | 39.5 |
| #4 | 5.2 | 15 | .4 | 96.4 | 41.7 | 18.9 | 58.3 |
| #8 | 1.9 | 3. | 3 | 79.2 | 32.5 | 9.1 | 67.5 |
| #16 | 1.5 | 1. | 7 | 63.4 | 26.0 | 6.5 | 74.0 |
| #30 | 1.4 | 1. | 4 | 48.1 | 19.9 | 6.1 | 80.1 |
| #50 | 1.3 | 1. | 3 | 25.4 | 10.8 | 9.0 | 89.2 |
| #100 | 1.3 | 1. | 2 | 4.2 | 2.4 | 8.4 | 97.6 |
| LBW | 1.0 | 0. | 8 | 0.5 | 0.8 | 1.6 | 99.2 |
| Production (| Gradation O Batch Plant Grada | ations | egate SupplierGra | dations | Adjusted WF | Intial Production | on Sample (IPS |

| Coars | seness Factor: | 59 | Workability Factor: | 33 | |
|------------------------|----------------------------|--------|---|----------|----|
| 45] | 45, 44 | 52, 41 | | JMF Zone | |
| Factor (%) | | 52, 34 | 58, 39 68, 38 68, 38 69, 36 Production Sadation | 75, 39 | |
| Workability Factor (%) | Operating Zone Boundary | | 58, 31 689,331 | 75, 28 | |
| 25 - 4 | 0 45 | 50 | Coarseness Factor (%) | 75 | 80 |

| Workability Factor: | | 35 | |
|---------------------|----------------------------|------|-----------------------|
| Sieve | Sieve Cumulative % Passing | | 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" | 95.1 | 4.9 | 4.9 |
| 1/2" | 74.6 | 20.5 | 25.4 |
| 3/8" | 59.3 | 15.3 | 40.7 |
| #4 | 42.1 | 17.2 | 57.9 |
| #8 | 35.1 | 7.1 | 64.9 |
| #16 | 29.2 | 5.9 | 70.8 |
| #30 | 21.9 | 7.3 | 78.1 |
| #50 | 9.6 | 12.4 | 90.4 |
| #100 | 2.4 | 7.2 | 97.6 |
| LBW | 0.9 | 1.5 | 99.1 |