#### **Production Gradation Report**

PLANT #: P-101 Contractor:

Sample Date: 8/23/21 DM Concrete Grade: Dates Test Represents: 8/24/2021 8/30/2021 through

|            | 10   10 0 0 11101 |              |              | 0,00,00         |                     |                   |
|------------|-------------------|--------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class | Pit #             | Source       | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
| 6AA        | 71-47             | Presque Isle | 1560         | 9.54            | 2.62                | 53.6              |
| 26A        | 71-47             | Presque Isle | 200          | 1.22            | 2.62                | 6.9               |
| 2NS        | 75-051            | Mid-Michigan | 1150         | 6.93            | 2.66                | 39.5              |
|            |                   | Total \M/s   | 2010         | 17.60           |                     | 100.0             |

MDOT No.:

| SUPERIOR<br>MATERIALS |
|-----------------------|

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

| *Maximum | % | Retained | must | he | ahove | the | 3/8" 9 | ieve |
|----------|---|----------|------|----|-------|-----|--------|------|

\*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                    | 2910    | 17.69               |          | 100.0                   | < Verify this n  | umber is 100%            |
|--------------|-----------------------------|---------|---------------------|----------|-------------------------|------------------|--------------------------|
| Sieve        | 6AA                         | 26      | 6A                  | 2NS      | Cumulative<br>% Passing | % Retained       | Cumulative<br>% 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"           | 98.4                        | 10      | 0.0                 | 100.0    | 99.1                    | 0.9              | 0.9                      |
| 3/4"         | 85.3                        | 10      | 0.0                 | 100.0    | 92.1                    | 7.0              | 7.9                      |
| 1/2"         | 42.7                        | 96      | 6.5                 | 100.0    | 69.0                    | 23.1             | 31.0                     |
| 3/8"         | 24.8                        | 87      | 7.8                 | 100.0    | 58.8                    | 10.2             | 41.2                     |
| #4           | 3.5                         | 24      | 1.2                 | 99.3     | 42.8                    | 16.1             | 57.2                     |
| #8           | 2.0                         | 6       | .5                  | 82.5     | 34.1                    | 8.7              | 65.9                     |
| #16          | 1.8                         | 2       | .7                  | 65.8     | 27.2                    | 7.0              | 72.8                     |
| #30          | 1.7                         | 2       | .0                  | 49.4     | 20.6                    | 6.6              | 79.4                     |
| #50          | 1.6                         | 1       | .9                  | 24.2     | 10.6                    | 10.0             | 89.4                     |
| #100         | 1.5                         | 1       | .7                  | 5.7      | 3.2                     | 7.4              | 96.8                     |
| LBW          | 1.3                         | 1       | .5                  | 0.7      | 1.1                     | 2.1              | 98.9                     |
| Production G | radation O Batch Plant Grad | lations | regate Supplier Gra | adations | Adjusted WF             | Initial Producti | on Sample (IPS           |

| Production Gradation   | Batch Plant Gradation | ns   | ons         | Adjusted WF              | Initial Produc | tion Sample (IPS | 3) |
|--|-----------------------|--|-------------|--------------------------|----------------|------------------|----|
| Coarseness Factor  | 62                    | Workability Factor:                                      | 34          | 36.6                     | Coars          | seness Factor:   |    |
| 45   |                       |  |             |                          | Worl           | kability Factor: |    |
| 45, 44   |                       |  | JMF Zone    | $\neg \mid \blacksquare$ | Sieve          | Cumulative       |    |
| 1 1 1  |                       |  | JIVII ZOIIC | <b>-</b>                 | Sieve          | % Passing        | R  |
| 10 1   | 52, 41                |  |             | - 11                     | 2"             | 100.0            |    |
| <b>%</b> 40 1  | 57, 3                 | 67, 39   | 75, 39      | - 11                     | 1.5"           | 100.0            |    |
| <b>(a)</b>   | !                     | 00, 30   | I           | - 11                     | 1"             | 100.0            |    |
|  |                       | ■ 60, 38°S   |             | - 11                     | 3/4"           | 95.0             |    |
| 25 Jactor →  | i                     | i PS   |             | - 11                     | 1/2"           | 70.5             |    |
| 1 / •  | 52, 34                | il   |             | - 11                     | 3/8"           | 60.0             |    |
| 45, 33   |                       |  |             | - 11                     | #4             | 44.4             |    |
| <b>5</b> 30 <del> </del>   | 57, 3                 | <b>67</b> <sub>6</sub> <b>3</b> , <b>1</b> <sub>31</sub> |             | - 11                     | #8             | 35.5             |    |
| Operating Zon  | e                     |  |             | - 11                     | #16            | 28.5             |    |
| Application of the state of the | -                     |  | 75, 28      | - 11                     | #30            | 21.5             |    |
| ≥ <sub>25</sub>  |                       |  |             |                          | #50            | 10.2             |    |
| 40 45  | 50 55                 | 60 65 70   | 75          | 80                       | #100           | 3.1              |    |
| .5   |                       | Coarseness Factor (%)                                    | . 0         | ""                       | LBW            | 1.3              |    |

| Work  | ability 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       |

PREPARED BY: SM, LLC Technical Service

ActionLimits Boundary = - - - - -

PLANT #: P-102

Sample Date:

8/23/21 DM Concrete Grade: 8/24/2021 8/30/2021

Contractor:

MDOT No.:

| Dates Test F | Represents: | 8/24/2021 | through      | 8/30/2021       |                     |                   |
|--------------|-------------|-----------|--------------|-----------------|---------------------|-------------------|
| Agg. Class   | Pit #       | Source    | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
| 6AA          | 58-003      | Stoneco   | 1550         | 9.23            | 2.69                | 52.5              |
| 26A          | 58-003      | Stoneco   | 255          | 1.52            | 2.69                | 8.6               |
| 2NS          | 63-114      | Highland  | 1150         | 6.95            | 2.65                | 38.9              |
|              |             | Total Wt  | 2955         | 17.71           |                     | 100.0             |

| Weight (SSD) | ••                  | Gravity                            | Contribution                                      |
|--------------|---------------------|------------------------------------|---|
| 1550         | 9.23                | 2.69                               | 52.5  |
| 255          | 1.52                | 2.69                               | 8.6   |
| 1150         | 6.95                | 2.65                               | 38.9  |
| 2955         | 17.71               |                                    | 100.0   |
|              | 1550<br>255<br>1150 | 1550 9.23<br>255 1.52<br>1150 6.95 | 1550 9.23 2.69<br>255 1.52 2.69<br>1150 6.95 2.65 |

Coarseness Factor:

| SUPER | RIOR |
|-------|------|

**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.

|                 | i otai wt                   | 2955         | 17.71              |          | 100.0                | < Verify this n | umber 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"              | 99.5                        | 10           | 0.0                | 100.0    | 99.7                 | 0.3             | 0.3                   |
| 3/4"            | 83.2                        | 10           | 0.0                | 100.0    | 91.2                 | 8.5             | 8.8                   |
| 1/2"            | 41.9                        | 99           | 9.4                | 100.0    | 69.5                 | 21.7            | 30.5                  |
| 3/8"            | 18.7                        | 81           | .2                 | 100.0    | 55.7                 | 13.7            | 44.3                  |
| #4              | 2.2                         | 9            | .6                 | 98.9     | 40.5                 | 15.3            | 59.5                  |
| #8              | 1.2                         | 2            | .5                 | 83.6     | 33.4                 | 7.1             | 66.6                  |
| #16             | 0.7                         | 1            | .8                 | 66.9     | 26.6                 | 6.8             | 73.4                  |
| #30             | 0.6                         | 1            | .6                 | 49.0     | 19.5                 | 7.0             | 80.5                  |
| #50             | 0.6                         | 1            | .5                 | 23.5     | 9.6                  | 9.9             | 90.4                  |
| #100            | 0.5                         | 1            | .4                 | 5.9      | 2.7                  | 6.9             | 97.3                  |
| LBW             | 0.5                         | 1            | .3                 | 1.1      | 0.8                  | 1.9             | 99.2                  |
| Production Grad | lation O Batch Plant Gradat | ions ( ) Agg | regate Supplier Gr | adations | Adjusted WF          | Intial Producti | on Sample (IP:        |

| Coarseness Factor:   | 66     | Workability Factor:   | 33                 | 35.9   |
|--|--------|-----------------------|--------------------|--------|
| 45 45, 44  |        |                       | JMF Zone           | $\Box$ |
| actor (%)  |        | 68, 38<br>• 60   26   | 75, 39<br>radation |        |
| Morkability Factor (%) 35 - 45, 33 Operating Zone Boundary | $\neg$ | 57-32 <sub>6,31</sub> | 75, 28             |        |
| 25 + 40 45  ActionLimits Boundary =                        | 50 55  | Coarseness Factor (%) | 75                 | 80     |

| Work  | ability Factor:      | 36            |                       |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | %<br>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                  |

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PLANT #: P-20

Sample Date:

**Production Gradation** 

8/23/21 Concrete Grade: **DM** 8/24/2021 through 8/30/2021 Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

Coarseness Factor:

36.0

| Dates Test F | Represents: | 8/24/2021    | through      | 8/30/2021       |                     |                   |
|--------------|-------------|--------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class   | Pit #       | Source       | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
| 6AA          | 71-47       | Presque Isle | 1605         | 9.82            | 2.62                | 55.2              |
| 26A          | 71-47       | Presque Isle | 200          | 1.22            | 2.62                | 6.9               |
| 2NS          | 63-92       | Grange Hall  | 1100         | 6.65            | 2.65                | 37.9              |
|              |             | Total Wt     | 2905         | 17.69           |                     | 100.0             |

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| SI |

Superior Materials, LLC

30701 W. 10 Mile Rd. Suite 500

suite 500

Farmington Hills, MI 48336

|       | Total Wt | 2905  | 17.69 |       | 100.0                   | < Verify this no | umber is 100%            |
|-------|----------|-------|-------|-------|-------------------------|------------------|--------------------------|
| Sieve | 6AA      | 26    | A     | 2NS   | Cumulative<br>% Passing | % Retained       | Cumulative<br>% 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"    | 98.2     | 100   | 0.0   | 100.0 | 99.0                    | 1.0              | 1.0                      |
| 3/4"  | 83.0     | 100.0 |       | 100.0 | 90.6                    | 8.4              | 9.4                      |
| 1/2"  | 40.8     | 98    | .7    | 100.0 | 67.2                    | 23.4             | 32.8                     |
| 3/8"  | 22.6     | 91    | .0    | 100.0 | 56.6                    | 10.6             | 43.4                     |
| #4    | 2.9      | 28    | .8    | 97.9  | 40.7                    | 16.0             | 59.3                     |
| #8    | 1.8      | 6.    | 4     | 84.8  | 33.5                    | 7.1              | 66.5 r                   |
| #16   | 1.7      | 2.    | 8     | 68.9  | 27.2                    | 6.3              | 72.8                     |
| #30   | 1.6      | 2.    | 4     | 49.7  | 19.9                    | 7.4              | 80.1 r                   |
| #50   | 1.6      | 2.2   |       | 19.1  | 8.3                     | 11.6             | 91.7                     |
| #100  | 1.4      | 2.0   |       | 3.2   | 2.1                     | 6.1              | 97.9                     |
| LBW   | 1.4      | 1.    | 8     | 0.4   | 1.0                     | 1.1              | 99.0                     |

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.

 $^{\star}\%$  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:                                 | 65     | Workability Factor:                              | 34         |    |
|--|--------|--|------------|----|
| 45 45 45, 44 45, 44 45, 33 Operating Zone Boundary | 52, 41 | 57, 40 68, 40 68, 38  ■ 60, 36 PS Production Gra |            |    |
| 25 40 45  ActionLimits Boundary =                  | 50 55  | Coarseness Factor (%)                            | 75, 28<br> | 80 |

Batch Plant Gradations

| 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"  | 89.2            | 10.8     | 10.8       |
| 1/2"  | 68.4            | 20.8     | 31.6       |
| 3/8"  | 59.9            | 8.6      | 40.1       |
| #4    | 43.0            | 16.9     | 57.0       |
| #8    | 35.9            | 7.1      | 64.1       |
| #16   | 29.0            | 6.8      | 71.0       |
| #30   | 21.3            | 7.7      | 78.7       |
| #50   | 9.9             | 11.4     | 90.1       |
| #100  | 2.4             | 7.5      | 97.6       |
| LBW   | 1.2             | 1.2      | 98.8       |

PREPARED BY: SM, LLC Technical Service Approved By

PLANT #: P-32 Contractor: 8/23/21 DM Sample Date: Concrete Grade:

| Dates Test F | Represents: | 8/24/2021    | through      | 8/30/2021       |                     |                   |
|--------------|-------------|--------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class   | Pit #       | Source       | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>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          | 95-013      | Smelter Bay  | 1150         | 6.95            | 2.65                | 39.6              |
|              |             | Total Wt     | 2905         | 17.69           |                     | 100.0             |

MDOT No.:

---- Verify this number is 100%

| SUPERIOR<br>MATERIALS |
|-----------------------|

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

| Sieve | 6AA   | 26A   | 2NS   | Cumulative % Passing | % Retained | Cumulative % Retained |    |
|-------|-------|-------|-------|----------------------|------------|-----------------------|----|
| 2"    | 100.0 | 100.0 | 100.0 | 100.0                | 0.0        | 0.0                   | ĺ  |
| 1.5"  | 100.0 | 100.0 | 100.0 | 100.0                | 0.0        | 0.0                   | ı  |
| 1"    | 97.6  | 100.0 | 100.0 | 98.7                 | 1.3        | 1.3                   | ı  |
| 3/4"  | 82.1  | 100.0 | 100.0 | 90.4                 | 8.3        | 9.6                   | ı  |
| 1/2"  | 45.2  | 96.0  | 100.0 | 70.5                 | 20.0       | 29.5                  | ı  |
| 3/8"  | 25.8  | 87.8  | 100.0 | 59.5                 | 10.9       | 40.5                  | *  |
| #4    | 5.2   | 19.6  | 97.2  | 42.6                 | 16.9       | 57.4                  | *  |
| #8    | 2.4   | 5.2   | 82.3  | 34.2                 | 8.4        | 65.8                  | nc |
| #16   | 1.9   | 2.4   | 67.0  | 27.7                 | 6.5        | 72.3                  | ,  |
| #30   | 1.7   | 1.9   | 48.4  | 20.2                 | 7.5        | 79.8                  | nc |
| #50   | 1.6   | 1.7   | 25.2  | 10.9                 | 9.3        | 89.1                  | *  |
| #100  | 1.5   | 1.5   | 5.2   | 3.0                  | 8.0        | 97.0                  | а  |

Aggregate Supplier Gradations

0.9

1.0

36.7

0.9

\*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.

| Coars                  | seness Factor:             | 62        | Workability Factor:               | 34       |    |
|------------------------|----------------------------|-----------|-----------------------------------|----------|----|
| 45                     | 45, 44                     |           |                                   | JMF Zone |    |
| (%) L                  |                            | 52, 41    | 68, 38                            | 75, 39   |    |
| ity Facto              | 45, 33                     | 52, 34    | Production Gradation              |          |    |
| Workability Factor (%) | Operating Zone<br>Boundary |           | 67 <sub>68</sub> ,32 <sub>1</sub> | 75, 28   |    |
| 25                     | 0 45 mits Boundary =       | 50 55<br> | Coarseness Factor (%)             | 75       | 80 |

| Work  | ability Factor:      | 36            |                       |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | %<br>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                  |

99.0

**Coarseness Factor:** 

2.0

Adjusted WF Intial Production Sample (IPS)

PREPARED BY: SM, LLC Technical Service

1.1

Batch Plant Gradations

LBW

**Production Gradation** 

8/23/21

PLANT #: P-35

Sample Date:

**Production Gradation** 

DM Concrete Grade: 8/30/2021

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

35.1

| Dates Test F | Represents: | 8/24/2021  | through      | 8/30/2021       |                     |                   |
|--------------|-------------|------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class   | Pit #       | Source     | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
| 6AA          | 58-003      | Stoneco    | 1555         | 9.26            | 2.69                | 52.6              |
| 26A          | 58-003      | Stoneco    | 300          | 1.79            | 2.69                | 10.2              |
| 2NS          | 81-093      | Burmeister | 1100         | 6.65            | 2.65                | 37.2              |
|              |             | Total Wt   | 2955         | 17.70           |                     | 100.0             |

| %          |  |
|------------|--|
| ntribution |  |
| 52.6       |  |
| 10.2       |  |
| 37.2       |  |

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

|       | i otai Wt | 2955 | 17.70 |       | 100.0                   | < Verify this n | umber is 100%            |
|-------|-----------|------|-------|-------|-------------------------|-----------------|--------------------------|
| Sieve | 6AA       | 26   | 6A    | 2NS   | Cumulative<br>% Passing | % Retained      | Cumulative<br>% 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"    | 99.5      | 10   | 0.0   | 100.0 | 99.7                    | 0.3             | 0.3                      |
| 3/4"  | 83.2      | 10   | 0.0   | 100.0 | 91.2                    | 8.6             | 8.8                      |
| 1/2"  | 41.9      | 99   | 9.4   | 100.0 | 69.4                    | 21.8            | 30.6                     |
| 3/8"  | 18.7      | 81   | 1.2   | 100.0 | 55.3                    | 14.1            | 44.7                     |
| #4    | 2.2       | 9    | .6    | 99.0  | 39.0                    | 16.3            | 61.0                     |
| #8    | 1.2       | 2    | .5    | 85.1  | 32.6                    | 6.4             | 67.4                     |
| #16   | 0.7       | 1    | 1.8   |       | 25.3                    | 7.2             | 74.7                     |
| #30   | 0.6       | 1    | .6    | 46.0  | 17.6                    | 7.7             | 82.4                     |
| #50   | 0.6       | 1    | .5    | 14.8  | 6.0                     | 11.6            | 94.0                     |
| #100  | 0.5       | 1    | .4    | 2.2   | 1.2                     | 4.8             | 98.8                     |
| LBW   | 0.5       | 1    | .3    | 0.7   | 0.7                     | 0.6             | 99.3                     |

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:                              | 66                      | Workability Factor:         | 33                                   |    |
|---|-------------------------|-----------------------------|--------------------------------------|----|
| 45 45, 44 45, 44 45, 33 Operating Zone Boundary | 52, 41<br>56,<br>52, 34 | 68, 38 ■ 60 <sub>1</sub> β§ | JMF Zone 75, 39  or Gradation 75, 28 |    |
| 40 45  ActionLimits Boundary =                  | 50 55                   | Coarseness Factor (%)       | 75                                   | 80 |

Batch Plant Gradations

| Work  | ability Factor:      | 36            |                       |
|-------|----------------------|---------------|-----------------------|
| Sieve | Cumulative % Passing | %<br>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                  |

Batch Plant Gradations

8/23/21

PLANT #: P-36

Sample Date:

**Production Gradation** 

DM Concrete Grade:

Contractor:

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

36.5

| Dates Test Represents: |       | 8/24/2021    | through      | 8/30/2021       |                     |                   |
|------------------------|-------|--------------|--------------|-----------------|---------------------|-------------------|
| Agg. Class             | Pit # | Source       | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
| 6AA                    | 71-47 | Presque Isle | 1605         | 9.82            | 2.62                | 55.2              |
| 26A                    | 71-47 | Presque Isle | 200          | 1.22            | 2.62                | 6.9               |
| 2NS                    | 63-92 | Grange Hall  | 1100         | 6.65            | 2.65                | 37.9              |
|                        |       | Total Wt     | 2905         | 17.69           |                     | 100.0             |



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| l otal Wt |       | 2905 | 17.69       |       | 100.0                   | < Verify this n | umber is 100%            |
|-----------|-------|------|-------------|-------|-------------------------|-----------------|--------------------------|
| Sieve     | 6AA   | 26   | <b>A</b>    | 2NS   | Cumulative<br>% Passing | % Retained      | Cumulative<br>% 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"        | 96.8  | 10   | 0.0         | 100.0 | 98.2                    | 1.8             | 1.8                      |
| 3/4"      | 77.4  | 10   | 0.0         | 100.0 | 87.5                    | 10.7            | 12.5                     |
| 1/2"      | 41.0  | 96   | 5.0         | 100.0 | 67.1                    | 20.4            | 32.9                     |
| 3/8"      | 23.5  | 87   | <b>'</b> .8 | 100.0 | 56.9                    | 10.2            | 43.1                     |
| #4        | 4.5   | 19   | ).6         | 97.9  | 40.9                    | 16.0            | 59.1                     |
| #8        | 2.7   | 5    | 5.2         |       | 34.0                    | 6.9             | 66.0                     |
| #16       | 2.2   | 2    | 2.4         |       | 27.5                    | 6.5             | 72.5                     |
| #30       | 1.9   | 1.   | 9           | 49.7  | 20.0                    | 7.5             | 80.0                     |
| #50       | 1.7   | 1.   | .7          | 19.1  | 8.3                     | 11.7            | 91.7                     |
| #100      | 1.6   | 1.   | .5          | 3.2   | 2.2                     | 6.1             | 97.8                     |
| LBW       | 1.2   | 0.   | .9          | 0.4   | 0.9                     | 1.3             | 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.

63

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

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

| Coarseness Factor:                              | 65     | Workability Factor:                                 | 34                           |    |
|---|--------|---|------------------------------|----|
| 45 45, 44 45, 44 45, 33 Operating Zone Boundary | 52, 41 | 58, 39<br>68, 38<br>Froduction Grad<br>1PS<br>68,31 | JMF Zone 75, 39 ation 75, 28 |    |
| 40 45  ActionLimits Boundary =                  | 50 5   | 5 Coarseness Factor (%) <sup>70</sup>               | 75                           | 80 |

| Work  | ability Factor: | 35       |            |
|-------|-----------------|----------|------------|
| Sieve | Cumulative      | %        | Cumulative |
|       | % 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       |

PLANT #: P-39 Contractor:

Sample Date: 8/23/21 DM Concrete Grade: Dates Test Represents: 8/24/2021 8/30/2021 through

| Agg. ( | Class | Pit#   | Source          | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
|--------|-------|--------|-----------------|--------------|-----------------|---------------------|-------------------|
| 6A     | A     | 71-47  | Presque Isle    | 1605         | 9.82            | 2.62                | 55.2              |
| 26     | iΑ    | 71-47  | Presque Isle    | 200          | 1.22            | 2.62                | 6.9               |
| 2N     | IS    | 44-051 | Krake Willis Rd | 1100         | 6.65            | 2.65                | 37.9              |
|        |       |        | Total Wt        | 2905         | 17.69           |                     | 100.0             |

MDOT No.:

---- Verify this number is 100%

Coarseness Factor:

33.3

| SI | UP: | II. | RI | OR |
|----|-----|-----|----|----|

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|                 | i Otal VVt                  | 2903 17.09 |            | 100.0                | C Verily tills II | ullibel is 100 /6        |
|-----------------|-----------------------------|------------|------------|----------------------|-------------------|--------------------------|
| Sieve           | 6AA                         | 26A        | 2NS        | Cumulative % Passing | % Retained        | Cumulative<br>% 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"              | 98.4                        | 100.0      | 100.0      | 99.1                 | 0.9               | 0.9                      |
| 3/4"            | 85.3                        | 100.0      | 100.0      | 91.9                 | 7.2               | 8.1                      |
| 1/2"            | 42.7                        | 96.5       | 100.0      | 68.1                 | 23.8              | 31.9                     |
| 3/8"            | 24.8                        | 87.8       | 100.0      | 57.6                 | 10.5              | 42.4                     |
| #4              | 3.5                         | 24.2       | 97.2       | 40.4                 | 17.2              | 59.6                     |
| #8              | 2.0                         | 6.5        | 77.2       | 30.8                 | 9.6               | 69.2                     |
| #16             | 1.8                         | 2.7        | 59.0       | 23.5                 | 7.3               | 76.5                     |
| #30             | 1.7                         | 2.0        | 43.0       | 17.4                 | 6.2               | 82.6                     |
| #50             | 1.6                         | 1.9        | 21.4       | 9.1                  | 8.2               | 90.9                     |
| #100            | 1.5                         | 1.7        | 7.8        | 3.9                  | 5.2               | 96.1                     |
| LBW             | 1.3                         | 1.5        | 1.2        | 1.3                  | 2.6               | 98.7                     |
| Production Grad | dation O Batch Plant Gradat | ions       | iradations | Adjusted WF          | Intial Production | on Sample (IPS           |

\*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.

| Coarseness Factor:                              | 61     | Workability Factor:                                     | 31               |    |
|---|--------|---|------------------|----|
| 45 45, 44 45, 44 45, 33 Operating Zone Boundary | 52, 41 | 56, 40 68, 38 68, 38 Froduction Graphtion 58, 32 68,832 | 75, 39<br>75, 28 |    |
| 40 45  ActionLimits Boundary =                  | 50 5   | Coarseness Factor (%)                                   | 75               | 80 |

| Workability Factor: |                                    | 36   |                       |
|---------------------|------------------------------------|------|-----------------------|
| Sieve               | ieve Cumulative % % Passing Retain |      | 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                  |

8/23/21

8/24/2021

Batch Plant Gradations

PLANT #: P-O2

Sample Date:

Dates Test Represents:

**Production Gradation** 

Concrete Grade: DM

8/30/2021

MDOT No.:

Adjusted WF Intial Production Sample (IPS)

**Coarseness Factor:** 

34.1

Contractor:

| Agg. Class | Pit#   | Source       | Weight (SSD) | ft <sup>3</sup> | Specific<br>Gravity | %<br>Contribution |
|------------|--------|--------------|--------------|-----------------|---------------------|-------------------|
| 6AA        | 71-47  | Presque Isle | 1605         | 9.82            | 2.62                | 55.2              |
| 26A        | 71-47  | Presque Isle | 200          | 1.22            | 2.62                | 6.9               |
| 2NS        | 63-115 | Ray Rd       | 1100         | 6.65            | 2.65                | 37.9              |
|            |        | Total Wt     | 2905         | 17.69           |                     | 100.0             |

through

---- Verify this number is 100%

| Superior Materials, LLC    |
|----------------------------|
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| Suite 500                  |
| Farmington Hills, MI 48336 |

|       | I Otal Wt | 2903 17.09 |       | 100.0                   | < verily tris fi | uniber is 100%           |
|-------|-----------|------------|-------|-------------------------|------------------|--------------------------|
| Sieve | 6AA       | 26A        | 2NS   | Cumulative<br>% Passing | % Retained       | Cumulative<br>% 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"    | 96.8      | 100.0      | 100.0 | 98.2                    | 1.8              | 1.8                      |
| 3/4"  | 77.4      | 100.0      | 100.0 | 87.5                    | 10.7             | 12.5                     |
| 1/2"  | 41.0      | 96.0       | 100.0 | 67.1                    | 20.4             | 32.9                     |
| 3/8"  | 23.5      | 87.8       | 100.0 | 56.9                    | 10.2             | 43.1                     |
| #4    | 4.5       | 19.6       | 95.6  | 40.0                    | 16.9             | 60.0                     |
| #8    | 2.7       | 5.2        | 78.6  | 31.6                    | 8.4              | 68.4                     |
| #16   | 2.2       | 2.4        | 62.8  | 25.2                    | 6.5              | 74.8                     |
| #30   | 1.9       | 1.9        | 47.1  | 19.0                    | 6.1              | 81.0                     |
| #50   | 1.7       | 1.7        | 25.3  | 10.6                    | 8.4              | 89.4                     |
| #100  | 1.6       | 1.5        | 6.1   | 3.3                     | 7.3              | 96.7                     |
| LBW   | 1.2       | 0.9        | 0.8   | 1.0                     | 2.3              | 99.0                     |

Aggregate SupplierGradations

\*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.

| Coarseness Facto                              | r: 63 | Workability Factor:      | 32     |    |
|---|-------|--------------------------|--------|----|
| 45 45, 44 45, 44 45, 33 Operating Zo Boundary |       | 58, 39                   | 75, 28 |    |
| 25 40 45  ActionLimits Boundary = -           |       | 55 Coarseness Factor (%) | 75, 26 | 80 |

| Workability Factor: |                      | 35            |                       |
|---------------------|----------------------|---------------|-----------------------|
| Sieve               | Cumulative % Passing | %<br>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"                | 95.1                 | 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                  |

PREPARED BY: SM, LLC Technical Service Approved By