

## MIX DESIGN REVIEW CHECKLIST

|                                                                                          |                         |                                                             |                                      |                                      |
|------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------|--------------------------------------|--------------------------------------|
| CS-JN<br>82000-205935A                                                                   |                         | JMF #<br>P1-FM MDOT Grade P1_6" Slump_Azteca Plant 3 (M-10) |                                      |                                      |
| REVIEWER<br>San Rofoo                                                                    |                         | APPROVED<br><input checked="" type="checkbox"/>             | AS NOTED<br><input type="checkbox"/> | REJECTED<br><input type="checkbox"/> |
|                                                                                          |                         | DATE<br>10/07/2019                                          |                                      |                                      |
| <b>THE SUBMITTAL MUST INCLUDE THE FOLLOWING:</b>                                         |                         | <b>YES</b>                                                  | <b>NO</b>                            | <b>N/A</b>                           |
| Form 1976 – Job Mix Formula (JMF) Concrete Field Communication                           |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Source of Materials                                                                      |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Batch Weights of Constituent Materials (Dry)                                             |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| For Optimized Gradations Only – Individual Aggregate Gradations                          |                         | <input type="checkbox"/>                                    | <input type="checkbox"/>             | <input checked="" type="checkbox"/>  |
| Specific Gravity of Constituent Materials (Dry - Required, SSD - Optional)               |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Typical Ranges:                                                                          | Type I Portland Cement: | 3.15(approximate)                                           | 3.15                                 |                                      |
|                                                                                          | Class F Fly Ash:        | 2.20 – 2.70                                                 | 2.70 Class F                         |                                      |
|                                                                                          | Class C Fly Ash:        | 2.55 – 2.80                                                 |                                      |                                      |
|                                                                                          | Slag Cement:            | 2.85 – 2.95                                                 |                                      |                                      |
|                                                                                          | Coarse Aggregate:       | 2.55 – 2.85                                                 | 2.67                                 |                                      |
|                                                                                          | Intermediate Aggregate: | 2.55 – 2.85                                                 |                                      |                                      |
|                                                                                          | Fine Aggregate:         | 2.60 – 2.80                                                 | 2.62                                 |                                      |
| Dry Loose or Dry Rodded Unit Weight of Coarse Aggregate                                  |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Water/Cementitious Ratio (w/cm) – 0.45 max                                               |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Volume (dry, rodded) of coarse aggregate per unit volume concrete – 65 – 75% (inclusive) |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Aggregate Absorptions and Correction Factors                                             |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Typical Absorptions:                                                                     | Coarse Aggregate:       | ≤ 2.5%                                                      | 0.53                                 |                                      |
|                                                                                          | Intermediate Aggregate: | ≤ 2.5%                                                      |                                      |                                      |
|                                                                                          | Fine Aggregate:         | ≤ 2.0%                                                      | 1                                    |                                      |
| Alkali-Silica Reactivity (ASR) testing results for fine aggregate                        |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Date of completion within the last 2 years                                               |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| Conforms with one of the methods in c.5.A of 12SP604B                                    |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             |                                      |
| <b>STRENGTH, COMPRESSION</b>                                                             |                         |                                                             |                                      |                                      |
| The Lower Specification Limit (LSL) at 28 days, or                                       |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             | <input type="checkbox"/>             |
| 70% of the Lower Specification Limit (LSL) at 7 days (Method 1 verification only)        |                         | <input type="checkbox"/>                                    | <input type="checkbox"/>             | <input checked="" type="checkbox"/>  |
| <b>SUPPLEMENTAL CEMENTITIOUS MATERIALS (SCM)</b>                                         |                         |                                                             |                                      |                                      |
| If Used, Maximum Slag Cement Replacement is 40% (Minimum replacement 25% for P1M and DM) |                         | <input type="checkbox"/>                                    | <input type="checkbox"/>             | <input checked="" type="checkbox"/>  |
| If Used, Maximum Fly Ash Replacement is 40% (Minimum replacement 25% for P1M and DM)     |                         | <input checked="" type="checkbox"/>                         | <input type="checkbox"/>             | <input type="checkbox"/> 25%         |
| If Both Are Used, They Must Not Exceed 40% of Cementitious Material                      |                         | <input type="checkbox"/>                                    | <input type="checkbox"/>             | <input checked="" type="checkbox"/>  |

**DOCUMENTATION**

|                                                    |                                                               |                                                                                                                        |      |
|----------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|
| Air Content                                        | Average Values<br>from Test Data:<br>09/28/2018<br>12/29/2018 | 6.55                                                                                                                   | (%)  |
| Slump                                              |                                                               | 4.98                                                                                                                   | Inch |
| Compressive Strength                               |                                                               | 5050                                                                                                                   | Psi  |
| Concrete Age at Time of Test                       |                                                               | 28                                                                                                                     | Days |
| Verification Method Use (ref. c.5.B.2 of 12SP604B) |                                                               | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> |      |

**QPL/APPROVED SOURCE CHECK**

|                                                                       | YES                                 | NO                       | N/A                                 |
|-----------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| Coarse Aggregate 6AA O-N Minerals (Michigan) Co. Port Inland "75-005" | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Intermediate Aggregate                                                | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Fine Aggregate 2NS Stoneco-East Burmeister "81-093"                   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Cement LafargeHolcim - Alpena, MI Type I/II Low Alkali                | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Fly Ash Boral Resources - Monroe Power Plant "Monroe,MI"              | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Slag Cement                                                           | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Admixtures BASF-MasterAir AE200, Premiere OptiFlo MR                  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Specified Dosage Greater Than Minimum or Within Dosage Range          | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

**CEMENTITIOUS CONTENT**

|                                                             |                                     |                          |  |
|-------------------------------------------------------------|-------------------------------------|--------------------------|--|
| Meets Requirements (ref. Table 1 of 12SP604B) 517-611 "526" | <input checked="" type="checkbox"/> | <input type="checkbox"/> |  |
|-------------------------------------------------------------|-------------------------------------|--------------------------|--|

**YIELD AND OPTIMIZED GRADATION CHECK**

|                                                                                  |                                     |                          |                                     |
|----------------------------------------------------------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| Mix Design Yields (Use Concrete Job Mix Formula Yield Calculator) 27.08          | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| If Used, Optimized Aggregate Gradation Meets Appendix 1 requirements of 12SP602D | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|                                                                                         |                                     |                                     |                          |
|-----------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|
| Trial Batch Test Records (expires every 2 years)                                        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| Stockpile Management Plan                                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| General Letter of Certification                                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| Material Data Test Reports                                                              | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Alkali-Silica Reactivity Report (expires every 2 years) Expires: 09/24/2020             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| Plant NRMCA Certification (expires every 2 years) Expires: 05/06/2020                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| Aggregate Scale Certificate of Calibration (expires every 6 months) Expires: 03/23/2019 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| Admixture Dispensing Equipment Check (expires every 90 days) Expires: 12/19/2019        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| Water Supply Documentation                                                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |

**COMMENTS/NOTES:**

- Job mix formula was reviewed per MDOT 12SP-604A-09.