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**ADDENDUM NO. 1  
TO SPECIFICATIONS  
FOR THE  
2018 CONCRETE ROAD IMPROVEMENT PROGRAM  
VILLAGE OF BEVERLY HILLS AND VILLAGE OF BINGHAM FARMS  
OAKLAND, MICHIGAN**

ISSUED: July 3, 2018

HRC Job No. 20180523

This Addendum is issued prior to receipt of proposals to provide for certain changes and clarifications to the Specifications and/or the Drawings, as herein specified, and is hereby made a part of the Contract Documents and shall be taken into consideration in preparing the Proposal. All other conditions remain the same. **The Proposer shall acknowledge the receipt of this Addendum by signing below, including this and the attached Proposal Sheets with their proposals, and completing the Addenda section on Sheet P-5 of the Proposal Form.** Failure to sign the Addenda Section of the Proposal Form in the submission of the proposal may be justification for the proposal being rejected as non-responsive.

The following lists the extent of this Addendum. Descriptions of the changes or clarifications are given within each heading.

**SPECIFICATIONS**

**REISSUED:**

**Section 00010 – Table of Contents**

- Special Provision for Quality Assurance and Quality Control of Portland Cement Concrete has been added.

**Quality Assurance and Quality Control of Portland Cement Concrete**

- Specification added to the “Special Provisions” section of the Specification Book.

Received and Acknowledged By:

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

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SPECIAL PROVISION  
FOR  
**QUALITY ASSURANCE AND QUALITY CONTROL OF PORTLAND CEMENT CONCRETE**

HRC

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03-23-18

PART 1 GENERAL

1.1 SUMMARY

- A. This specification establishes guidelines for the Quality Assurance (QA) and Quality Control (QC) testing of concrete for the project.
- B. The Owner will be responsible for the acceptance of the concrete material based on representative samples obtained and tested by the Owner as described herein (QA testing).
- C. The Contractor will be responsible for all QC activities and QC testing needed to monitor, assess and adjust production and placement processes to ensure the final product will meet the specified levels of quality.
- D. If the Contractor does not perform QC testing, they may utilize the results of the Owner QA Testing under the following conditions;
  - 1. It is understood that Owner QA testing is comprised of randomly selected representative samples.
  - 2. The results of Owner QA testing or rejection of non-conforming materials cannot be used as a basis for claims for additional compensation, delays or extensions of time.

1.2 MEASUREMENT AND PAYMENT

- A. The Owner will pay for all QA testing of the concrete as specified herein.
- B. All costs for Contractor QC Testing shall be included in the cost for all pay items in which concrete is a material, unless otherwise indicated.

1.3 REFERENCES

- A. Abbreviations and Acronyms
  - 1. ASTM – American Society for Testing Materials
  - 2. MDOT – Michigan Department of Transportation
- B. Definitions
  - 1. Air Content - The recorded total air content of fresh concrete tested to this specification per ASTM Method C 231 or C 173.
  - 2. Concrete Mix Design - The actual batch quantities (mixture proportions) of each constituent included in the concrete mixture with supporting test data for each component and for the mix itself.
  - 3. Non- Conforming Work - Any work outside of acceptable tolerances for the item of work identified within these specifications
  - 4. Quality Assurance (QA) - Activities administered by the Owner dealing with acceptance of the product, including, but not limited to, materials sampling, testing, construction inspection, and review of Contractor QC documentation

5. Quality Control (QC) - All activities administered by the Contractor to monitor, assess and adjust production and placement processes to ensure the final product will meet the specified levels of quality, including, but not limited to, training, materials sampling, testing, project oversight and documentation.
  6. QC Plan - The project-specific plan developed by the Contractor describing, in detail, all aspects of production and construction for the project to ensure consistent control of quality to meet specification requirements.
  7. QC Plan Administrator- An employee of or consultant engaged by the Contractor, responsible for developing and overseeing all aspects of QC for the project.
  8. Slump - The recorded slump of fresh concrete tested to this specification per ASTM C 143.
  9. Start-Up Testing – Testing performed by QC and QA staff on the initial delivery of concrete to establish the compliance to the specifications prior to starting the placement.
  10. Temperature - The recorded temperature of fresh concrete tested to this specification per ASTM C 1064.
- C. Where referenced, “MDOT Specifications” is a general term that shall include the current version of the MDOT Standard Specifications for Construction and all Supplemental Specifications, Special Provisions, and Errata existing at the time of the award of the Contract.
- D. MDOT manuals that are referenced specifically by name shall be the current versions of said manuals existing at the time of the award of the Contract.

#### 1.4 SUBMITTALS

- A. Concrete Mix Design (s)
- B. Contractor QC Plan
1. The Contractor shall provide a QC Plan, for the Owners review:
    - a. At least ten (10) days prior to a Pre-Production Meeting if one is scheduled by the Owner
    - b. At least ten (10) days prior to the first placement of concrete.
  2. The Quality Control Plan must identify, at least, the following:
    - a. Personnel, including the project foremen
    - b. Coordination of activities; including project schedule
    - c. Hot and Cold Weather protection considerations and methods.
    - d. Mixing time and transportation, including time from batching to completion of delivery.
    - e. Placement and consolidation methods including monitoring of vibration.
    - f. Verification of tie bar placement
    - g. Testing
    - h. Finishing and Curing procedures
    - i. Non-Conforming Work

#### 1.5 QUALITY CONTROL

- A. Do not begin concrete placement until testing has verified that the concrete meets specifications.
- B. The Owner reserves the right to request a stoppage in production for concrete that is consistently out of specification.

1.6 QUALITY ASSURANCE

A. Acceptance based on Placement Time

1. The maximum interval between charging of the mixer and placing of concrete shall be as follows:

<u>Type of Unit</u>	<u>Below 60°F</u>	<u>60°F to 85°F</u>	<u>Above 85°F</u>
Open Top Trucks	60 Min	45 min	30 min
Open Top Agitating Units	60 min	60 min	30 min
Closed Top Agitating Units	90 min	60 min	45 min
Truck Mixers	90 min	60 min	45 min

2. For Concrete Mixes that contain Water Reducing-Retarding Admixtures:

<u>Type of Unit</u>	<u>Below 60°F</u>	<u>60°F to 85°F</u>	<u>Above 85°F</u>
Closed Top Agitating Units	120 min	90 min	75 min
Truck Mixers	120 min	90 min	70 min

3. For placements made from a ready-mix truck, the concrete is considered to have been placed when it is installed to the approximate section thickness and has begun to be finished.
4. For placements made using a slip form or form riding paver, the concrete is considered to have been placed when it passes through the paver.
5. For placements made using a pump, the concrete is considered to have been placed when it is discharged from the pump and appropriately finished.

B. Sampling at the Point of Placement:

1. Shall be per ASTM C 172 from the middle third of the delivery unit.
  - a. For single unit placements, sampling from the initial discharge of the delivery unit is permitted for informational testing only.
  - b. The sampling frequency during concrete placement for testing for temperature, slump and air content will be:
    - 1) On the first load of the day (Start-up Testing)
    - 2) At regular intervals, thereafter or at any time the material may appear to outside of these specifications.

C. Testing and acceptance at the Point of Placement:

1. Temperature
  - a. The temperature of the concrete, measured at the point of placement must be between 45 degrees and 90 degrees, Fahrenheit.
2. Air Content
  - a. The tested air content shall be at least 6.0 percent and shall not exceed 8.0 % for the in-place concrete.
    - 1) For placements made using a slip form paver or a pump, the air content sample shall be obtained at the point of placement after the concrete has passed through the paver or pump.
    - 2) The Contractor is responsible for the determination of losses of air through the paver or pump.
      - a) This shall be determined daily.
      - b) Losses more than 1.5% are cause for suspension of operations.

- c) Once an air loss is established for the day, samples can be obtained from the delivery unit and an air loss correction applied to determine compliance.
    - 3) The Contractor is responsible for repair of the concrete needed from taking a sample from pavement.
  - 3. Slump
    - a. The target slump and tolerances will be as stated on the Owner approved Mix Design. If no range is given the following tolerances shall apply:
      - 1) If the target slump is written as a “maximum” or “not to exceed” the production tolerances are:
        - a) Plus 0, minus 1 ½ inch for target slump 3” and less
        - b) Plus 0, minus 2 ½ inch for target slump over 3”
      - 2) If the target slump is not written as a “maximum” or “not to exceed” the production tolerances are:
        - a) Plus, or minus ½ inch for slump 2 inches and less
        - b) Plus, or minus 1 inch for slump over 2 but less than 4 inches
        - c) Plus, or minus 1 ½ inch for slump over 4 inches
  - 4. Addition of Water at Site
    - a. A one-time addition of water at the site will be permitted to adjust the slump
    - b. The adjusted slump must remain within the tolerances stated on the Owner approved Concrete Mix Design or to the tolerances as stated herein.
- D. Casting of Cylinders:
  - 1. For each day of production, the Owner will cast 4 x 8 or 6 x 12 test cylinders per ASTM C31 for the purposes of determining:
    - a. The in-place concrete strength for evaluation of imparting loads on it.
    - b. The 28-day strength of the concrete for evaluation of compliance to the design strength.
  - 2. Samples obtained for casting cylinders will also have temperature, slump and air tests made from the sample.
  - 3. The Cylinders will be cured and tested per ASTM C 31 and ASTM C 39.
  - 4. The Owner will determine the number of sets of cylinders to be taken for each mix type.
    - a. Up to five (5) test cylinders will be made by the Owner per set.
      - 1) Three (3) of these are to be reserved for curing at the testing facility to be tested at ages 7 days and 28 days.
      - 2) The remaining cylinders are to be cured in a similar manner to the in-place concrete and tested at an age when imparting loads to concrete is desired.
    - b. Additional cylinders can be made at the Contractors request to facilitate completion of the work
      - 1) The Contractor may request additional cylinders, to be tested at the contractors requested timing
      - 2) Delays caused by failure of the Contractor to request additional cylinders shall be the Contractor’s sole responsibility.
- E. Acceptance based on Compressive Strength testing of Cylinders:
  - 1. Evaluation for compliance to the design strength shall be based on the average of two of the cylinders, cured per ASTM C31, and tested at age 28 days.
  - 2. For a single day’s placement, compliance will be based on the achievement of the design strength from the tested cylinders for the placement.
  - 3. If only a single cylinder is available for testing at age 28 days, compliance will be based on that cylinder.

4. Compliance may be based on cylinders cured per ASTM C31 at ages beyond 28 days as permitted by the Owner

1.7 NON - CONFORMING WORK

A. Placement Time

1. When the age of a load of concrete reaches the placement time limits in Article 1.6 (after placement) placement of the concrete from that truck shall stop.
2. If less than 2/3 of the concrete has been placed, then no more concrete from that truck shall be placed
3. If more than 2/3 of the concrete in the truck has been placed, the Owner may accept the remaining concrete in the truck if when tested at that time, the temperature, slump and air content of the concrete are within the specifications herein.

B. Temperature

1. When the temperature of a load of concrete is outside of the limits indicated herein, placement of the concrete from that truck shall stop and the remaining concrete in the truck shall not be placed.
2. Concrete placed from the truck prior to the temperature test will be rejected, removed and replaced or subjected to a payment reduction at the discretion of the Owner.
3. The next available truck shall be tested for temperature prior to any concrete being placed. If the temperature is still out of specification production shall stop for the day.

C. Air Content

1. When a load of concrete, at the point of placement, is below 6.0% or greater than 8.0 % as specified herein, placement of the concrete from that truck shall stop and the remaining concrete in the truck shall not be placed.
2. The concrete placed from the truck prior to the air content test being made will be rejected, removed and replaced, or subjected to a payment reduction at the discretion of the Owner.
3. The next available truck shall be tested for air content prior to any concrete being placed. If the air is still out of specification production shall stop for the day or until such time that QC testing at the plant verifies the air to be in specification.

D. Slump

1. When the slump of a load of concrete is outside of the tolerances indicated herein placement of the concrete from that truck shall stop and the remaining concrete in the truck shall not be placed.
2. The concrete placed from the truck prior to the slump test being made will be rejected, removed and replaced, or subjected to a payment reduction at the discretion of the Owner.
3. The next available truck shall be tested for slump prior to any concrete being placed. If the slump is still out of specification production shall stop for the day or until such time that QC testing at the plant verifies the slump to be in specification.

E. Addition of Water at Site

1. If, after the one-time addition of water at the site permitted herein, the slump is outside of the tolerance indicated herein, the protocol of Item 1.7.D shall be followed



2. No further concrete shall be placed from a truck to which a second addition of water is made at the site.

F. Compressive Strength

1. When the 28-day Compressive strength of concrete is more than 500 psi below the design strength, the representative concrete will be removed and replaced.
2. When the 28-day compressive strength is within 500 psi of the design strength, the placement may be accepted using the statistical criteria of ACI 318.
3. The Contractor may request and be given the option to evaluate the placement by testing core samples drilled from the placement at their expense.
  - a. At least three cores, selected at random locations shall be cut and tested to evaluate the placement.
  - b. The cores are to be cut and conditioned per ASTM C 42, tested per ASTM C 42 and ASTM C39.
  - c. The criteria of ACI 318 shall be used to evaluate the core test results