

# Job-Task Analysis (JTA) for ACI Certification of CSA Standards Concrete Field Testing Technician

## HOW TO USE THIS JTA:

For each of the following assessment methods, the Candidate must:

### On the written examination:

- **Understand** the following general concepts, which may not have specified values, procedures, or measurements; *and*
- **Know** the following specific procedures or values; performance of these items may also be assessed on the performance examination.

### On the performance examination:

- **Perform**—or describe verbally, where allowed—the following tasks or steps, which are part of the specified procedure; knowledge of these items may also be assessed on the written examination.

## RESOURCES IN THIS PROGRAM:

CSA A23.2-17C	Temperature of freshly mixed hydraulic cement concrete
CSA A23.2-1C	Sampling plastic concrete
CSA A23.2-5C	Slump of concrete
CSA A23.2-6C	Density and yield of plastic concrete
CSA A23.2-4C	Air content of plastic concrete by the pressure method
CSA A23.2-3C	Making and curing concrete compression and flexural test specimens
CSA A23.2-19C	Slump flow of concrete

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### CSA A23.2-17C—Temperature of freshly mixed hydraulic cement concrete

- Know the working requirements, including measurement range and accuracy, of the temperature measuring device (TMD)
- Know the calibration requirements of the TMD
- Know the allowance for measuring temperature of concrete in transportation equipment
- Know the requirements for measuring temperature of concrete in either the transporting equipment or the forms
- Know the sampling requirements when not measured in transporting equipment or forms
- Perform temperature measurement as specified
- Perform reporting of temperature to the required accuracy

### CSA A23.2-1C—Sampling plastic concrete

- Understand the scope and significance of use of practice
- Know and perform (or describe verbally) the time limit for sampling
- Know and perform (or describe verbally) the transportation and remixing requirements within maximum time limits
- Know and perform (or describe verbally) the time limits for completing tests for slump, slump flow, temperature, air content, and molding specimens for strength tests
- Know and perform (or describe verbally) protection of sample
- Know and perform (or describe verbally) the requirements for sample sizes to be used for strength tests, air content, temperature, and slump
- Know and perform (or describe verbally) sampling procedures from stationary precast mixers, revolving drum truck mixers, or agitators

## **Job-Task Analysis (JTA) for ACI Certification of CSA Standards Concrete Field Testing Technician (Continued)**

- Know the procedure for removal of large maximum size aggregate
- Know the apparatus and procedure for wet sieving

### **CSA A23.2-5C—Slump of concrete**

- Understand the significance of the test method
- Know the maximum aggregate size for the test method
- Know the applicability of test method for non-plastic concrete and Self Consolidating Concrete (SCC)
- Know required equipment: sizes, shapes of mold, rod length and diameter, measuring device, and scoop
- Know the requirements for obtaining a sample
- Perform the test procedure, including filling of the mold, consolidation, lifting, and measuring as specified
- Perform reporting of the slump to the required accuracy

### **CSA A23.2-6C—Density and yield of plastic concrete**

- Understand the scope of test method
- Know the requirements of the apparatus (balance, rod/vibrator, measure, strike-off plate, mallet, scoop)
- Understand calibrated volume of the density (unit weight) measure
- Know the requirements for obtaining a sample
- Perform the test procedure, including tare weight, filling the measure, rodding/vibration, strike-off, cleaning, and weighing
- Know the differences in procedure when testing a sample of SCC
- Know and perform the calculation and reporting of density (unit weight) to the specified accuracy
- Know how to calculate yield
- Know how to calculate relative yield

### **CSA A23.2-4C—Air content of plastic concrete by the pressure method**

- Understand the scope and significance and use of test method
- Know the requirements for the proper working condition of the equipment
- Understand calibration record keeping and know how to verify that equipment has been calibrated as required
- Know the requirements for obtaining a sample
- Know and perform proper procedures for placement and consolidation of sample, including strike-off
- Know the differences in procedure when testing a sample of SCC
- Know and perform preparation procedures and assembly of air meter for test
- Perform test procedure (as per Clause 8 in the test standard), including proper sequence & use of water, petcocks, valves, pump, and gauge
- Perform reading of the pressure gauge
- Perform the release of pressure and disassembly of air meter
- Know and perform calculation of air content of sample tested
- Know that in rare cases where wet sieving is employed, an aggregate correction factor should be applied to the apparent air content determined on the sieved sample
- Perform reporting of air content to the required accuracy

## **Job-Task Analysis (JTA) for ACI Certification of CSA Standards Concrete Field Testing Technician (Continued)**

### **CSA A23.2-3C—Making and curing concrete compression and flexural test specimens**

- Understand the scope of practice
- Know the allowable types and sizes of molds
- Know the sizes and proper use of equipment, including tamping rod, vibrator, mallet, and placement & finishing tools
- Know the testing requirements, including acceptable nominal maximum aggregate sizes
- Know the requirements for obtaining a sample
- Perform molding of cylindrical specimen, including placing, consolidation, and finishing
- Know the differences in placing, consolidation and finishing of cylindrical test specimens made from a sample of SCC
- Know the procedure for molding of beam specimens, including placing, consolidation, and finishing and know the differences when making flexural test specimens using SCC concrete
- Know and perform (or demonstrate verbally) the requirements for initial storage of specimens

### **CSA A23.2-19C—Slump flow of concrete**

- Understand this method determines slump flow of SCC
- Know terms specific to this standard
- Understand the use of this test method
- Understand limitation of this test method
- Know the VSI values and criteria of Table 1 and Figures 1 to 4
- Know the requirements for the mold for this test
- Know the requirements for the base plate used in this test
- Know the requirements for the tamping rod
- Know the requirements for the measuring device and sample receptacle
- Understand how to obtain the test sample
- Know the test must be performed on a rigid non-absorbent smooth plastic surface having a minimum thickness of 12 mm and at least 800 mm square
- Know how to prepare the work surface (dampen)
- Know not to change the base plate during a project or study
- Know to remix sample to ensure it is homogenized
- Perform preparing the interior of the mold and placing it in correct orientation on the test surface (upright if  $T_{50\text{cm}}$  is to be determined)
- Perform correctly filling the mold to execute the test
- Know and perform within the time limit of filling and removal of the mould
- Know and perform within the parameters allowed before measuring the slump flow
- Know the assignment of a Visual Stability Index (VSI) number
- Know and perform the parameters that constitute invalid tests
- Know the  $T_{50\text{cm}}$  test
- Know recording the value observed to the nearest second
- Know and perform calculation of the slump flow
- Know and perform recording the average of two diameters (including halos if they exist) to the nearest 10 mm