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 A23.2-7C  Air content of plastic concrete by the volumetric method
- CSA A23.2-3C  Making and curing concrete compression and flexural test specimens
- CSA A23.2-19C  Slump flow of concrete

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
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.

**CSA A23.2-7C—Air content of plastic concrete by the volumetric method**
- Understand the scope and significance and use of test method
- Know the requirements for the proper working condition of the equipment
- Know the requirements for obtaining a sample
- Know proper procedures for placement and consolidation of sample, including strike-off
- Know the differences in procedure when testing a sample of SCC
- Know preparation procedures and assembly of air meter for test
- Know initial addition of water and alcohol to the air meter
- Know the proper process of inverting, shaking, and rolling the air meter to displace the volume of air in the concrete specimen
- Know how the initial meter reading is determined as specified, within allowable time & percentage limits
- Know how the final meter reading is determined as specified, within allowable time & percentage limits
- Know the disassembly of air meter
- Know upon visual examination of the measuring bowl after disassembly what constitutes a valid or invalid test
- Know the information used and the formula to calculate the air content
- Know the required accuracy of reporting the air content.

**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_{50cm} 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_{50cm} 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