

Job Task Analysis (JTA) for ACI Concrete Field Testing Technician—Grade I Certification

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:

ASTM C1064/C1064M—Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

ASTM C172/C172M—Standard Practice for Sampling Freshly Mixed Concrete

ASTM C143/C143M—Standard Test Method for Slump of Hydraulic-Cement Concrete

ASTM C138/C138M—Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

ASTM C231/C231M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C173/C173M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C31/C31M—Standard Practice for Making and Curing Concrete Test Specimens in the Field

ASTM C1064/C1064M—Standard Test Method for 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

ASTM C172/C172M—Standard Practice for Sampling Freshly Mixed 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 starting tests for slump, 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 mixers, paving mixers, revolving drum truck mixers or agitators, and continuous mixers
- Know and perform (or describe verbally) the procedure for removal of large maximum size aggregate
- Know the apparatus and procedure for wet-sieving

Job Task Analysis (JTA) for ACI Concrete Field Testing Technician—Grade I Certification (Continued)

ASTM C143/C143M—Standard Test Method for Slump of Hydraulic-Cement 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
- 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

ASTM C138/C138M—Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of 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 and perform the calculation and reporting of density (unit weight) to the specified accuracy
- Know how to calculate theoretical density
- Know how to calculate yield
- Know how to calculate relative yield
- Understand the influence of cement content on density (unit weight)
- Understand the relationship of air content and density (unit weight)

ASTM C231/C231M—Standard Test Method for Air Content of Freshly Mixed 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 recordkeeping 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 and perform preparation procedures and assembly of air meter for test
- Perform test procedure (using Type A or Type B meter), 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 and perform proper use of aggregate correction factor in calculating air content
- Perform reporting of air content to the required accuracy

ASTM C173/C173M—Standard Test Method for Air Content of Freshly Mixed 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
- Understand calibration recordkeeping 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

Job Task Analysis (JTA) for ACI Concrete Field Testing Technician—Grade I Certification (Continued)

- Know and perform preparation procedures and assembly of air meter for test
- Know and perform initial addition of water and alcohol to the air meter
- Perform the process of inverting, shaking, and rolling the air meter to displace the volume of air in the concrete specimen
- Perform initial meter reading as specified, within allowable time & percentage limits
- Perform final meter reading as specified, within allowable time & percentage limits
- Perform the disassembly of air meter
- Know and perform examination of measuring bowl to verify a valid or invalid test
- Know and perform calculation of air content
- Perform reporting of air content to the required accuracy

ASTM C31/C31M—Standard Practice for Making and Curing Concrete Test Specimens in the Field

- 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 procedure for molding of beam specimens, including placing, consolidation, and finishing
- Know and perform the marking of specimens for identification
- Know and perform (or demonstrate verbally) the requirements for initial storage of specimens