

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

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:

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

- Understand the Scope and the Significance and Use of the test method, including time requirements based on oversize aggregates
- Know the equipment requirements
- Know the verification requirements of the equipment used in this test method
- 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

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

ASTM C172/C172M, *Standard Practice for Sampling Freshly Mixed Concrete*

- Understand the Scope and the Significance and Use of the practice
- Know and perform (or describe verbally) the time limit for obtaining sample portions
- 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

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

- Understand the Scope and the Significance and Use of the test method, including the plastic concrete properties appropriate for testing
- Know the equipment requirements
- Know the requirements for obtaining a sample
- Know the maximum aggregate size permitted
- Understand the time limits associated with the test
- Perform the test procedure, including filling of the mold, consolidation, lifting, and measuring as specified
- Perform reporting of 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 the test method
- Know the equipment requirements
- Understand calibrated volume of the density (unit weight) measure
- Know the requirements for obtaining a sample
- Know the capacity of measure requirements for different aggregates
- Know the requirements for consolidation
- Perform the test procedure, including filling, rodding/vibration, strike-off, cleaning, and mass determination of both empty and filled measure
- Know and perform the calculation and reporting of density (unit weight) to the required accuracy
- Know how to calculate and report theoretical density to the required accuracy
- Know how to calculate and report yield to the required accuracy
- Know how to calculate and report relative yield to the required accuracy
- Know how to calculate and report air content to the required accuracy

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

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

- Understand the Scope and the Significance and Use of the test method, including the applicable types of concrete appropriate for testing
- Know the equipment requirements
- Know the calibration requirements for the equipment used in this test method
- Know the requirements for obtaining a sample
- Know the maximum aggregate size permitted
- Know and perform proper procedures for sample placement and consolidation, including strike-off
- Perform test procedure (using Type A or Type B meter), including proper sequence and use of water, petcocks, valves, pump, and pressure gauge
- Perform reading of the pressure gauge after release of pressure into sample
- Perform proper release of pressure and disassembly of air meter
- Know and perform proper use of aggregate correction factor
- Know and perform calculation of air content of sample tested
- 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 the Significance and Use of the test method, including the applicable concrete types appropriate for testing
- Know the equipment requirements
- Know the calibration requirements for the equipment used in this test method
- Know the requirements for obtaining a sample
- Know the maximum aggregate size permitted
- Know and perform proper procedures for placement and consolidation of sample, including strike-off
- Know and perform initial addition of water and alcohol to the air meter
- Know and perform the process of inverting, shaking, and rolling the air meter to displace the volume of air in the concrete specimen
- Know and perform the steps required if the reading is outside of the range of the meter
- 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 of sample tested
- Perform reporting of air content to the required accuracy

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

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

- Understand the Scope and the Significance and Use of the practice, including reasons for curing by standard or field methods
- Know the equipment requirements
- Know the requirements for obtaining a sample
- Know the maximum aggregate size allowed
- Know the fresh property tests to be performed when strength specimens are molded
- Know the requirements for consolidation
- Know and perform the procedure for molding cylindrical specimens, including casting, consolidation, finishing, identification, and protection to prevent moisture loss
- Know the procedure for molding of beam specimens, including casting, consolidation, finishing, identification, and protection to prevent moisture loss
- Know the requirements for standard curing including storage, initial curing, and final curing
- Know the requirements for field curing
- Know and perform (or describe verbally) the requirements for transportation of specimens to the laboratory
- Know the reporting requirements