

# Job-Task Analysis (JTA) for ACI Masonry Laboratory Testing Technician 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 C90—Standard Specification for Loadbearing Concrete Masonry Units

ASTM C140/C140M and Annex A1—Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

ASTM C270—Standard Specification for Mortar for Unit Masonry

ASTM C780—Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

ASTM C780 Annex A4—Mortar Aggregate Ratio Test Method

ASTM C780 Annex A6—Compressive Strength of Molded Masonry Mortar Cylinders and Cubes

ASTM C1019—Standard Test Method for Sampling and Testing Grout

ASTM C1314—Standard Test Method for Compressive Strength of Masonry Prisms

ASTM C1552—Standard Practice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing

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## ASTM C90—Standard Specification for Loadbearing Concrete Masonry Units

- Understand scope of the specification
- Know three classes of concrete masonry units (CMUs)
- Understand requirements of materials used to fabricate CMUs
- Know requirements for compressive strength and absorption
- Know requirements for face shell and web thickness hollow units
- Know ratio requirement for net area and gross area of solid units
- Know thickness requirement for end flange units
- Know permissible variations in dimensions
- Know limits relative to finish and appearance

## **Job-Task Analysis (JTA) for ACI Masonry Laboratory Testing Technician Certification (Continued)**

### **ASTM C140/C140M and Annex A1—Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units**

- Understand scope of the method
- Understand significance and use of the method
- Know requirements for measurement devices
- Know requirements for number of specimens for measurement
- Know and perform procedure for obtaining dimensional measurements
- Understand requirements of the compression machine
- Know requirements for compression test specimens
- Understand the procedure for capping test specimens
- Know and perform procedure for positioning specimens in machine
- Know proper moisture condition for test specimens
- Know and perform proper loading rate
- Know and perform procedure for compressive strength testing
- Know equipment requirements for absorption determination
- Know requirements of absorption test specimens
- Know and perform procedure for absorption testing
- Know and understand calculations for:
  - Absorption
  - Moisture content
  - Density
  - Net volume
  - Average net area
  - Gross area
  - Net area compressive strength
  - Gross area compressive strength
  - Normalized web area
  - Equivalent thickness
  - Percent solid
  - Maximum variation from specified dimensions
- Know and perform reporting requirements

### **ASTM C270—Standard Specification for Mortar for Unit Masonry**

- Understand scope of the specification
- Understand use of the specification
- Understand the different types of mortar covered by this specification
- Understand there are proportion and property requirements in this specification
- Understand limitations of C270

## **Job-Task Analysis (JTA) for ACI Masonry Laboratory Testing Technician Certification (Continued)**

### **ASTM C780—Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry**

- Understand the scope of the method
- Understand the significance and use of the method
- Know the difference between pre-construction and construction evaluations
- Know how a pre-construction evaluation of a mortar system is performed
- Understand the limitations of the test methods
- Understand the relationship between compressive strength results obtained using this test method versus the minimum compressive strength specified in the property requirements of ASTM C270, Standard Specification for Mortar for Unit Masonry
- Understand the hazards associated with using isopropyl alcohol
- Know the reporting requirements

### **ASTM C780 Annex A4—Mortar Aggregate Ratio Test Method**

- Understand scope of the mortar aggregate ratio test method
- Know the apparatus required to perform the mortar aggregate ratio procedure
- Know and perform procedure for laboratory portion of the mortar aggregate ratio test
- Know calculations for moisture content
- Know and understand the calculations for aggregate content
- Know reporting requirements for mortar aggregate ratio test

### **ASTM C780 Annex A6—Compressive Strength of Molded Masonry Mortar Cylinders and Cubes**

- Understand scope of the compressive strength test method
- Know and perform procedure for compression testing
- Know, understand, and perform the calculations for compressive strength
- Understand reporting requirements for compressive strength

### **ASTM C1019—Standard Test Method for Sampling and Testing Grout**

- Understand scope of the method
- Understand significance and use of the method
- Understand the requirements for acceptance of alternative methods
- Understand procedures relative to curing at the laboratory
- Know and perform capping procedure for grout prisms
- Know and perform procedure for dimensional measurements
- Know and perform loading procedure and rate of loading
- Know, understand, and perform the calculations for compressive strength
- Understand reporting requirements
- Understand reporting requirements for mold of masonry units
- Understand reporting requirements for alternative methods

## **Job-Task Analysis (JTA) for ACI Masonry Laboratory Testing Technician Certification (Continued)**

### **ASTM C1314—Standard Test Method for Compressive Strength of Masonry Prisms**

- Understand scope of the method
- Understand significance and use
- Understand different masonry prism construction
- Know proper curing conditions and requirements
- Know proper methods for obtaining required measurements
- Know capping procedure for masonry prisms
- Know and understand how to use test apparatus
- Know how to install test prism into test machine
- Know loading procedure and rate of load
- Know and be able to report modes of failure
- Know and understand the calculations for masonry prism strength
- Know and understand the calculations for compressive strength of masonry
- Understand reporting requirements

### **ASTM C1552—Standard Practice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing**

- Understand scope of the method
- Understand significance and use of the method
- Know all equipment requirements for proper performance of this method
- Know materials used to perform capping of CMUs
- Understand compressive strength of capping materials
- Know and perform procedure for preparation of specimens for capping
- Know and perform procedure for capping test specimens
- Know and perform procedure for capping with gypsum cement
- Know procedure for capping with sulfur
- Know and perform procedure for checking planeness of caps
- Know requirements for cap thickness
- Know requirements and procedures for handling imperfections in caps
- Know requirements to perform capping verification