

# Job-Task Analysis (JTA) for ACI Tilt-Up Supervisor and Technician Certification

## HOW TO USE THIS JTA:

On the written examination, the Candidate must:

- **Understand** the following general concepts, which may not have specified values, procedures, or measurements; *and*
- **Know** the following specific procedures or values.

## RESOURCES:

*The Construction of Tilt-Up* by the Tilt-Up Concrete Association, 2nd Edition, 2016

## AREAS OF COMPETENCY:

Safety Communications and Procedures  
Planning and Scheduling  
Structural Systems  
Site Preparation and Foundations  
Slabs on Grade  
Layout and Forming  
Concrete Properties and Placement  
Erection and Bracing  
Panel Finishes and Building Finishing

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### Safety Communications and Procedures

- Know when safety meetings are to be held
- Know who should attend and what is to be covered in a safety meeting
- Know where non-participants to the lift should be
- Know how to identify site hazards
- Understand communications with crane operator
- Know when to check brace attachments after lifting and bracing
- Know where to locate the correct rigging configuration for panels
- Understand where to locate information regarding overhead obstructions

### Planning and Scheduling

- Know what information is in Panel Books and Panel Drawings
- Understand concepts that make tilt-up construction sustainable
- Know when alternative casting methods might be required
- Know factors to consider during pre-construction planning
- Understand factors to determine whether to lift from inside or outside the building
- Know the factors used to schedule casting and lifting sequences
- Understand the requirements for crane selection
- Understand what elements are important when “panelizing” an elevation
- Know common surfaces for casting panels
- Understand simple procedures for estimating panel weight
- Understand methods for insulating tilt-up walls
- Understand what types of buildings are most prevalent and economical to build
- Know who should be involved in determining panel layout and scheduling
- Know what items are to be considered in a pre-pour checklist
- Know the means for assessing benchmarks for quality control

# **Job-Task Analysis (JTA) for ACI Tilt-Up Supervisor and Technician Certification (Continued)**

## **Structural Systems**

- Understand components and importance of the roof diaphragm
- Know basic requirements for reinforcement cover and spacing
- Know orientation, tolerance, and placement of imbeds
- Know the purpose and type of connection between the panels, roof, and floor
- Understand the impact of reveals on structural performance
- Understand when a panel crack is of concern
- Know when the engineer should be contacted if designs are modified
- Know the impact of lifting loads on reinforcement amount and location

## **Site Preparation and Foundations**

- Understand the types of foundations used in tilt-up construction
- Know the impact of panel weight on the footing
- Know the important site factors impacting the crane
- Know the typical distance between the bottom of panel and footing
- Understand soil characteristics and their impact on foundations
- Know when the grout should be packed beneath the panels
- Understand the importance of a good sub-base and compaction

## **Slabs on Grade**

- Know the importance and methods of slab finishing and evaluating flatness
- Know timing application of curing compounds and bond breakers
- Understand the role of the slab thickness in bracing panels
- Know how to properly apply bond breakers
- Understand the factors influencing slab quality
- Know the reasons and methods for curing floor slabs
- Know the alternatives and parameters to alternate casting locations
- Understand the reasons for slab curing
- Understand the impact of floor joints on panel appearance
- Understand what a closure strip is and why it is used
- Understand types of floor joints and their purposes

## **Layout and Forming**

- Know factors affecting layout and sequencing processes
- Know when alternative casting methods are economical
- Know importance of reveal locations and how to ensure they are accurate
- Know what items to check prior to casting
- Know the different types of hardware cast into panels and their purpose
- Know how panels are typically cast
- Know materials and systems for forming panels
- Understand interaction between bond breaker and reinforcement
- Understand the purpose and use of chamfer strips
- Know tolerances, orientation, and installation methods of embeds and inserts
- Understand the proper method of bond breaker application
- Know the design, materials, and methods for use of reveals
- Know where to find information regarding inserts, strongbacks, and lifting strength

# **Job-Task Analysis (JTA) for ACI Tilt-Up Supervisor and Technician Certification (Continued)**

## **Concrete Properties and Placement**

- Know the difference between the lifting and design strength of concrete
- Understand the material standard setting entities and what they govern
- Understand how cylinder, beam, and slump tests are taken and what they measure
- Understand what constitutes supplementary cementitious materials and their impact
- Know about water-cement ratio and impact of water on concrete mixes
- Understand how and when to use water reducing admixtures
- Understand the definition and procedures for cold weather concreting
- Understand procedures for hot weather concreting
- Know the reason and proper methods for vibrating concrete
- Know how to use curing compounds and methods
- Understand cement types and uses
- Know the materials, general proportions, and properties of concrete
- Understand the concept for mix proportioning/design
- Know the properties of aggregate and their impact on concrete
- Know the methods and techniques for placement and finishing concrete
- Know the types and uses of admixtures
- Know the reasons and impact of air entrainment in concrete
- Know inherent safety dangers with fresh concrete
- Understand the important checks recommended before casting
- Know methods and systems for supporting steel reinforcement
- Know the sustainability attributes of the manufacturing of cement and concrete
- Understand the fire rating of concrete
- Know the factors and process by which concrete cures

## **Erection and Bracing**

- Know critical planning considerations and procedures for lifting and bracing
- Understand who generally analyzes lifting and bracing insert designs
- Know personnel location and responsibilities during erection
- Know rigging components and configurations
- Know when panel braces should be attached and adjusted
- Know when panel braces can be removed
- Understand the factors that impact lifting capacity of the crane
- Understand how to minimize floor damage when lifting panels
- Know how proper booming affects lifting
- Know what to do if components do not match up
- Know procedures to prevent and loosen sticking panels
- Know the definition and uses of tandem picks and suitcase picks
- Know procedures for walking panels and walk-out panels
- Know how to safely conduct a blind pick
- Understand the correct use and application of strongbacks
- Understand safety factors for inserts and braces
- Know the minimum number of braces for a panel
- Know procedures if a panel cannot be placed after erection
- Understand how to brace to locations other than floor slab
- Understand brace configuration, location, and tolerances
- Know lifting and design strength of concrete
- Know the timing, materials, and purpose for shimming and foot grouting

## **Job-Task Analysis (JTA) for ACI Tilt-Up Supervisor and Technician Certification (Continued)**

### **Panel Finishes and Building Finishing**

- Understand the different types of architectural treatments and finishes for tilt-up panels
- Know the parameters for painting tilt-up panels
- Know the parameters for cleaning
- Understand the types and purpose of panel connections
- Know the materials and methods for troubleshooting and repair of panels
- Know what materials are used for caulking joints
- Know how to prepare joints for caulk and the common causes of joint failure
- Understand the limitations and considerations for exposing aggregate
- Understand the most economical and common finishes
- Understand the types and uses of interior insulation systems
- Know the benefits and methods of sandblasting panels