

Job-Task Analysis (JTA) for ACI Certification of Specialty Commercial/Industrial Concrete Flatwork Finisher & 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:

ACI 302.1R *Guide for Concrete Floor and Concrete Slab Construction*
Silica Fume User's Manual

ACI 302.1R *Guide for Concrete Floor and Concrete Slab Construction*, Chapters 1–4

- Understand the basis used to classify floors.
- Know and perform the sealing requirements for vapor retarders and barriers.
- Understand the selection criteria for a vapor retarder or barrier.
- Understand when moisture protection is essential.
- Be able to identify when to begin machine operations for concrete placed on a vapor retarder.
- Know how to handle forms that have been damaged by rain.
- Know the slab thickness requirements over supporting steel.
- Understand the soil-support system characteristics.
- Know how proof-rolling is accomplished.
- Know the tolerance for rough grading.
- Know the maximum base penetration for a tire of a loaded concrete truck mixer.
- Be able to set forms and screed guides for positive drainage.
- Know the maximum and ideal temperature differentials between the temperature of the base and the concrete at the time of placement.
- Know the proper use of heaters.

ACI 302.1R *Guide for Concrete Floor and Concrete Slab Construction*, Chapters 5–7

- Understand mixture proportioning with regards to shrinkage.
- Understand the cements used for high early strength.
- Understand the cements used in shrinkage compensating floors.
- Understand the preference for natural sand and gradation to minimize water demand.
- Know the requirements for maximum size of coarse aggregates.
- Understand what type of aggregates are frequently used as surface treatments.
- Know when and when not to use air entrainment and why.
- Know the effect of high-range water-reducing admixtures on slump at point of placement.
- Understand the significant contributors to corrosion of steel in concrete.
- Understand the benefits of using silica fume in concrete.
- Understand the benefits of synthetic fibers for plastic concrete.

Job-Task Analysis (JTA) for ACI Certification of Specialty Commercial/Industrial Concrete Flatwork Finisher & Technician (Continued)

- Know when and when not to use evaporation retarders and why.
- Understand when and when not to use elastomeric sealants.
- Understand why accurate batching of admixtures and colored pigments is critical.
- Know how to determine the length of the period after arrival at the jobsite during which the concrete can properly be worked.

ACI 302.1R *Guide for Concrete Floor and Concrete Slab Construction*, Chapters 8.1–8.3

- Understand the most efficient way to place concrete in large areas.
- Understand the coordination of operations.
- Be able to place concrete at an appropriate rate.
- Know the proper sizing of finishing crews.
- Understand what tools should not be used to spread concrete.
- Understand how concrete should be delivered with regards to segregation of the concrete components.
- Know the concerns of spreading by vibration.
- Know proper use of a vibrator.
- Be able to remove slight imperfections, humps, and voids.
- Be able to demonstrate when to begin floating.
- Know how to determine when mechanical pan floating should begin.
- Know how to achieve flatness/levelness within tolerances.
- Understand which floor-placing and finishing operations have the greatest effect on achieving the specified grade.
- Know when to use wet-screed guides.
- Understand the use of a bull float for floor flatness greater than FF20.
- Understand when wooden bull floats are preferable.
- Know the purpose and use of the modified highway straightedge.

ACI 302.1R *Guide for Concrete Floor and Concrete Slab Construction*, Chapters 8.4–8.17

- Understand flatness F-number (FF).
- Understand levelness F-number (FL).
- Understand the designation and range of FF/FL.
- Know how and when to remove water from the surface of green concrete.
- Be able to start, stop, and maneuver the power trowel around the slab.
- Be able to control the power trowel while finishing the edge of the slab.
- Be able to machine trowel with the blades at the proper angle.
- Be able to cross-check the slab perpendicular to placement and at 45-degree angles.
- Be able to cut down the slab after initial strike-off.
- Be able to apply the surface treatment at the proper time in the slab construction sequence.
- Be able to apply appropriate amounts of surface treatment material in the appropriate manner.
- Be able to properly work aggregate into the top surface.
- Be able to place silica fume concrete in a controlled manner.
- Be able to strike off the surface in a proper manner.
- Be able to demonstrate immediate surface closure with steel fresno or magnesium trowel.
- Be able to employ minimal finishing and surface manipulation.
- Be able to properly provide early age surface evaporation protection.

Job-Task Analysis (JTA) for ACI Certification of Specialty Commercial/Industrial Concrete Flatwork Finisher & Technician (Continued)

- Be able to properly apply final texturing of the surface.
- Be able to demonstrate the timing of final surface protection and curing.

ACI 302.1R Guide for Concrete Floor and Concrete Slab Construction, Chapter 9

- Know the purpose of curing.
- Know the provisions for properly finishing joint filling if timing dictates that joints be filled early.
- Understand why it is advisable to defer joint filling and sealing as long as possible.
- Know the maximum temperature difference between curing water and the concrete to avoid thermal shock.
- Understand when to place wet coverings.
- Understand how to properly use wet coverings.
- Understand when to apply liquid membrane-forming curing compounds.
- Understand the moisture retention requirements for liquid membrane-forming curing compounds.
- Understand the proper curing of joints.
- Know when and be able to begin the curing process.
- Know how to and be able to properly protect the surface if concrete begins to dry excessively before completion of finishing operations.
- Understand cold-weather protective measures.
- Understand the causes of plastic-shrinkage cracking.
- Understand the timing of grinding.

ACI 302.1R Guide for Concrete Floor and Concrete Slab Construction, Chapters 10–11

- Know how to and be able to perform slightly modified finishing techniques for when surface crusting occurs.
- Understand the effect of water content on the amount of drying shrinkage.
- Know the long-term causes of cracking.
- Understand the causes of and preventive measures for low wear resistance.

Silica Fume User's Manual, Chapters 1–3

- Understand the effects of silica fume in concrete.
- Understand what admixtures allow for the use of silica fume in concrete.
- Know the proportioning relationship between silica fume and other cementitious materials.
- Know the effects of silica fume in concrete on allowable slumps for placement.

Silica Fume User's Manual, Chapters 7–9

- Understand the need for coordination between the concrete contractor and the silica-fume concrete supplier.
- Know the purpose and method for selecting slump for silica-fume concrete.
- Know the difficulties of working with silica-fume concrete.
- Be able to demonstrate protecting the surface of silica-fume concrete from drying.
- Be able to demonstrate when to begin curing silica-fume concrete.
- Be able to demonstrate how long to cure silica-fume concrete.
- Be able to perform one-pass finishing.
- Be able to perform appropriate consolidation of silica-fume concrete.