Why the Special Inspector Certification Program is “Special”

The program is gaining international recognition

BY LUKE M. SNELL

The ACI Concrete Construction Special Inspector certification program was designed to provide the necessary link between design and construction. A Concrete Construction Special Inspector is defined as “a person qualified to inspect and record the results of concrete construction inspection based on codes and job specifications.”

The program covers inspection during preplacement, placement, and post-placement operations. To qualify for certification, knowledge of concrete construction is required, including plans reading, formwork installation and removal, reinforcements, embedments, sampling and testing freshly mixed concrete, conveying, placing, consolidation, finishing, jointing, curing, and protection.

REQUIREMENTS

This program is one of the most comprehensive programs currently offered by ACI. It takes a person through the current literature on concrete technology and then tests his or her ability to find answers to most of the technical problems that an inspector might face on a concrete construction site.

The technical resource materials used in these programs include the following ACI publications:
- Manual of Concrete Inspection, SP-2(07);
- ACI Concrete Terminology;
- “Specifications for Tolerances for Concrete Construction and Materials (ACI 117-10) and Commentary”;
- “Guide for Structural Lightweight-Aggregate Concrete (ACI 213R-03)”;  
- “Specifications for Structural Concrete (ACI 301-10)”;  
- “Guide for Concrete Floor and Slab Construction (ACI 302.1R-04)”;  
- “Guide for Measuring, Mixing, Transporting, and Placing Concrete (ACI 304R-00)”;  
- “Placing Concrete by Pumping Methods (ACI 304.2R-96)”;  

Candidates for the ACI Concrete Construction Special Inspector certification program in Saudi Arabia
“Guide to Hot Weather Concreting (ACI 305R-10)”; “Guide to Cold Weather Concreting (ACI 306R-10)”; “Guide to Curing Concrete (ACI 308R-01)”; “Guide for Consolidation of Concrete (ACI 309R-05)”; “Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary”; and “Guide to Formwork for Concrete (ACI 347-04).”


The educational and work requirements as spelled out on the ACI Web site at www.concrete.org/certification/cert_prog.asp must be met. Applicants must also pass a 3-hour open-book exam that covers the technical material and a 1-hour closed book exam on plans reading.

**SAMPLE EXAM QUESTIONS**

1. The maximum size of aggregate used in structural concrete must not be more than:
   - A. One-fifth the narrowest dimension between sides of forms.
   - B. One-third the depth of the slab.
   - C. Three-fourths the minimum clear spacing between the reinforcing bars.
   - D. All of the above.
   **Answer:** D (ACI 318.3.3.2).

2. The proper way to fix a rock pocket detected during concrete placement is to:
   - A. Shovel mortar on top of it.
   - B. Shovel soft or very fluid concrete onto it.
   - C. Shovel rocks from the rock pocket into the softer sanded area.
   - D. Shovel mortar on top of it and revibrate the entire area.
   **Answer:** C (ACI 304R, Fig. 5.3(d)).

3. Which one of the following statements is false?
   - A. Concrete placed in hot weather develops higher early strengths.
   - B. Concrete placed in hot weather has increased durability.
   - C. Concrete placed in hot weather has generally lower strengths at 28 days or later.
   - D. Concrete demands more water when placed in hot weather.
   **Answer:** B (PCA, Design and Control, p. 234).

4. What is the fineness modulus for a fine aggregate with the following gradation?

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<th>% Passing</th>
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   - A. 3.05
   - B. 2.75
   - C. 2.60
   - D. 2.95
   **Answer:** D (PCA, Design and Control, pp. 83-84).

**TRAINING**

Anyone can take the certification exam by studying the material on their own; however, from my experience, that’s not advisable. The exam covers so much material that a person is much better off taking a class that covers the material in a digestible way. I, along with many others, have developed a training class that helps the students grasp this material in a classroom environment.

Some instructors hold their classes one night per week over an extended period of time. This is an excellent approach for those who can commit to the class without interruptions to their work schedules. Other instructors (myself included) run the class over 3 to 4 consecutive days. This immersion approach allows the students to concentrate just on concrete technology during that period of time. Homework assignments (refer to the sidebar) are given each night and students are encouraged to form study groups so they gain confidence in solving problems they might face on a concrete construction site.
The purpose of the training class is more than just helping the students get through the exam. It essentially becomes an educational program that takes the student through a review of the concrete technology concepts in an organized manner.

**BENEFITS OF SPECIAL INSPECTOR CERTIFICATION**

The ACI Concrete Construction Special Inspector certification is obviously geared to the field engineer and to those who are involved with the inspection process. As this certification program has gone international, it’s being viewed in a different way. Many countries don’t have professional engineering registration, nor do they have detailed university courses in concrete technology. Thus, the Special Inspector training and the certification program function as a way for an engineer to become updated on concrete technology. Taking and passing the Special Inspector certification test indicates a basic understanding of concrete technology and how it can be applied to concrete construction.

According to Mohammed Al Nagadi, President of the Saudi Building Code National Committee and President of the ACI Saudi Arabia Chapter, the ACI Concrete Construction Special Inspector certification program has introduced the concept that engineers must have more than a bachelor’s degree in engineering. They also must have both documented work experience and be able to show their competence by passing an engineering-based exam. This is especially needed in a place like Saudi Arabia. With its construction boom, there are engineers coming to Saudi Arabia from all over the world. By having these engineers participate in the ACI Concrete Construction Special Inspector certification program, the Saudi Arabian construction community can have more confidence in the technical competence of these engineers and their understanding of good construction practices and concrete technologies. Many of the construction companies in Saudi Arabia require that the personnel in their quality control departments take the Special Inspector course and complete the entire requirement for this certification.

The U.S. building code requires that concrete be tested by a Field Grade I Technician (ACI certification or an equivalent certification). As technicians become more experienced and ready to assume more responsibilities, certification as an ACI Concrete Construction Special Inspector documents that they have the work experience and knowledge for the additional responsibilities. It can also be an excellent educational program for those who work in quality control/quality assurance or who are working as field engineers.

Several Concrete Construction Special Inspector certification classes and exams are given worldwide. To locate one that fits your schedule and needs, visit the ACI certification Web site at [www.concrete.org/CERTIFICATION/cert.asp](http://www.concrete.org/CERTIFICATION/cert.asp).

Selected for reader interest by the editors.

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**SAMPLE HOMEWORK PROBLEMS**

1. **If you are designing a concrete mixture with design strength of 4000 psi and the standard deviation is 483 psi, what is the required average compressive strength?**

   **Answer:** 4647 psi (ACI 318, Table 5.3.2.1).

2. **What four values must be known to calculate the evaporation rate and to determine if plastic shrinkage cracking is likely to occur?**

   **Answer:** Air temperature, relative humidity, concrete temperature, and wind velocity (ACI 308, Fig. 4.1).

3. **We have a 1-hour delivery time for an open dump body truck that is delivering concrete to our job site. The required concrete temperature on the job site is 50°F and the air temperature is 25°F. What is the required concrete temperature at the batch plant?**

   **Answer:** 55°F (ACI 306.3.8).

4. **What is a dropchute?**

   **Answer:** A device used to confine or direct the flow of a falling stream of fresh concrete (ACI Concrete Terminology).