

ACI Certification

Coming of Age in the Construction Industry

By John Nebasil

Twenty-five years ago, the American Concrete Institute (ACI) began a program to certify technicians testing fresh concrete in the field. It was ACI's first program to assess and certify the competence of field workers, and it was not without its skeptics. At the time, many felt that ACI's stated purpose, "to provide a comradeship in finding the best ways to do concrete work of all kinds and in spreading that knowledge," should be limited to developing, publishing, and disseminating written information, and conducting conferences and seminars. This view was countered by those who believed that the technical information ACI disseminated was to a large degree not being applied by the individuals actually handling concrete on construction projects. These ACI members were persuasive, and in 1980 the ACI Board of Direction gave the green light to develop the first of what are now 14 different programs to certify concrete technicians, inspectors, supervisors, and craftsmen.

A Reliable Measure of Concrete Strength

ACI's first program, *Concrete Field Testing Technician – Grade I*, received support from the cement and ready-mixed concrete industries through their participation on ACI Certification Committees (developing and maintaining program policies, study, and exam materials) and by locally administering the program as examiners and proctors. Further, these industries assisted through participation on American Society for Testing and Materials (ASTM) committees to include language in ASTM Standards requiring technician certification for field testing concrete and its constituent materials. In 1985, when such language was included in ASTM C 94 Standard Specification for Ready-Mixed Concrete, ACI's program became the go-to entry-level program for concrete testing personnel.

A great deal of the acceptance of ACI's program is due to the ability to deliver consistent performance examinations on a national basis. The individuals specifying this program receive assurance that the concrete they specify is properly tested so the results are an accurate representation of the concrete placed in the structure. In short, it provides both the engineer and the material supplier with a reliable measure of as-delivered concrete strength.

Expansion of ACI's Programs

Following implementation of the Field Technician program, other programs were formulated for Concrete Flatwork Finisher and Concrete Construction Inspector – Level II (now known as Concrete Construction Special Inspector). Each was designed to address what ACI members perceived to be critical areas of construction in need of competency assessment programs. Craftsmen who pass the Flatwork Finisher test demonstrate the knowledge and ability to handle concrete properly through technique and timing; from placement and consolidation through floating, finishing, jointing and

initiation of proper curing. In use for 16 years, it is currently included in the ARCOM MASTERSPEC® Specification System, in Wal-Mart®, Lowes®, and Home Depot® project specifications, and in the 2005 version of ACI 301, *Specifications for Structural Concrete*.

ACI Special Inspector

The ACI Concrete Construction Special Inspector program addresses the need to have an individual on the job site with knowledge and ability to:

- Understand how to read codes, specifications, and project drawings; inspect reinforcement placement and formwork
- Determine if environmental conditions (such as hot or cold weather) warrant implementing special concreting operations
- Evaluate concrete conveyance, placement, consolidation methods, and testing procedures
- Perform post-placement inspection of concrete including curing

It's a comprehensive program that covers 19 separate construction industry resources. To be certified as an ACI Concrete Construction Special Inspector, an individual must (a) hold a current ACI Field Testing Technician – Grade I certification, (b) pass a general inspection written exam and separate plans reading exam, and (c) submit documentation of verifiable education/work experience. A listing of the program resources and detailed information regarding the certification criteria can be accessed through the ACI website, www.concrete.org.

Individuals certified as concrete construction inspectors perform different tasks depending on circumstance and employment. Therefore, the approach was to provide a credential that would meet many inspector employment/responsibility scenarios:

Contractor Quality Control

Inspectors may be employed by contractors as part of their quality control program. As stated in ACI SP-2, *Manual of Concrete Inspection*, "Inspection performed by or for the contractor, particularly when contractually required, will often be much more detailed than is the usual present day practice for acceptance



On-site inspection is a critical component of quality concrete construction

inspection.” The reason for this, the Manual states, is that, “...the contractor often uses his own quality-control inspection to ensure against later rejection of work that would be very costly to replace or correct.” Inspectors holding an ACI Concrete Construction Special Inspector certificate are qualified to competently perform this job.

Owner Acceptance

Inspections are performed by personnel representing the owner of a project. In this case, the inspector is performing an *acceptance inspection*. ACI SP-2 defines *acceptance inspection* as, “...determining that materials, procedures, and end products conform to the contract documents...” The Special Inspector certification program was designed to have individuals competently perform this task.

Building Code Compliance

A third type of inspection occurs when the inspector is employed by a governmental enforcement agency. In cases such as this, inspections are typically limited to issues regarding compliance to provisions contained in the legally-adopted general building code in effect for the project location.

The International Code Council's (ICC) *International Building Code* (IBC) states in Section 1704.1 that, “The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection.” The IBC leaves evaluation and acceptance of special inspector qualifications to the building official, and provides no further indication of what may be suitable credentials. However, ACI 318, *Building Code Requirements for Structural Concrete*, which forms the basis of the concrete sections of widely-adopted codes such as the IBC, does include guidance regarding the qualifications of inspectors in its companion ACI 318R *Commentary*. ACI 318R states, “The quality of concrete structures depends largely on workmanship in construction. The best of materials and design practices will not be effective unless the construction is performed well. Inspection is necessary to confirm that the

construction is in accordance with the design drawings and project specifications. Proper performance of the structure depends on construction that accurately represents the design and meets code requirements within the tolerances allowed. Qualification of the inspectors can be obtained from a certification program, such as the ACI Certification Program for Concrete Construction Special Inspector.” ACI 318R then suggests that in the absence of inspection requirements (situations in which a legally-adopted building code is not in effect such as some public works projects), the ACI Certification Program for Concrete Construction Special Inspector be deemed as evidence of suitable competence to perform concrete construction inspections.

Though *guidance* regarding the qualifications of inspectors is provided in some ACI documents -- such as the ACI Building Code's companion *Commentary*, ACI 318R; *Guide for Concrete Inspection*, ACI 311.4R; and *Manual of Concrete Inspection*, ACI SP-2 -- none of these documents *require* certification, since they are not written in mandatory language. If an engineer or owner wants inspectors to be certified, suitable language must be drafted and included in the project specifications. An example of this is the U.S. Army Corps of Engineers *Unified Facilities Guide Specifications*, UFGS - 02754 (August

2004), Section 1.4.1, which states in part, “...The individuals who sample and test concrete and concrete constituents shall be certified as American Concrete Institute (ACI) Concrete Field Testing Technicians, Grade I. The individuals who perform the inspection of concrete shall be certified as ACI Concrete Construction Inspector, Level II.” The name of the ACI program has since changed to Concrete Construction Special Inspector, but this is an example of how an owner can require certified inspectors by incorporating enforceable language into a specification.

The Concrete Construction Special Inspector program has the potential to improve the level of quality concrete construction. Engineers should inform owners of the merits of the program, and ask that the owner agree to hire inspectors who are certified.

Potential Value Can Be Realized

The ACI Field Testing Technician and ACI Flatwork Finisher program gained support within the concrete construction industry because the individuals certified in these programs contribute to the successful completion of concrete construction projects. Other ACI programs such as Concrete Strength Testing Technician, Laboratory Testing Technician, Aggregate Testing Technician, Tilt-Up Supervisor and Shotcrete Nozzleman all contribute in similar fashion. The Concrete Construction Special Inspector program can also play an integral role if it is recognized by engineers and owners for its potential value to the construction process.

The goal of the ACI-certified Concrete Construction Special Inspectors is to ensure the *project as specified* becomes the *project as built*. ■

Certification Programs

ACI currently offers personnel certification programs in the following specialties:

- Concrete Field Testing Technician - Grade I
- Canadian Standards Association - Based Concrete Construction Special Inspector
- Canadian Standards Association - Based Concrete Field Testing Technician Grade I
- Concrete Flatwork Finisher & Technician
- Concrete Strength Testing Technician
- Concrete Laboratory Testing Technician - Grade I
- Concrete Laboratory Testing Technician - Grade II
- Field Aggregate Testing Technician
- Laboratory Aggregate Testing Technician
- Concrete Transportation Construction Inspector
- Concrete Construction Special Inspector
- Tilt-Up Supervisor & Technician
- ACI Shotcrete Nozzleman (Dry-Mix Process)
- ACI Shotcrete Nozzleman (Wet-Mix Process)

For detailed information on these programs, visit the ACI Webpage at www.concrete.org

John Nehasil has been ACI's Managing Director of Certification for the past 9 years of his 28 years with ACI. Under his direction, ACI Programs have grown to administer over 24,000 exams annually in 14 programs for technicians, inspectors and craftsmen. For more information on ACI Certification, contact Mr. Nehasil at John.Nehasil@Concrete.org.

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