

How ACI's First Certification Program got its Start

A look back after 25 years of ACI certification

BY LUKE M. SNELL

Nowadays, everyone agrees that you can't have an effective quality control program without accurate and consistent testing procedures, and good testing procedures require knowledgeable technicians. But it wasn't always this way...

THE DARK AGES—BEFORE ACI CERTIFICATION

I was on a job site doing my weekly site visit, chatting with one of my best technicians. I commented on how well he knew his job of testing concrete—he laughed and told me that he had a really rocky start. After answering an ad in the newspaper and a brief interview, he was hired immediately and given 5 minutes of training (how to run a slump, how to make cylinders, forget air—it was too complicated of a test), and then sent off to the job site. Luckily, he survived his first experiences, left that company, and learned how to be a good concrete technician with another company.

This year, the American Concrete Institute is celebrating the 25th anniversary of its first certification program. As part of the celebration, we're honoring the individuals and committees who exhibited the foresight, fortitude, and conviction to develop and initiate the first ACI certification program. We've asked Luke Snell, as the Chair of the task group assigned to establish the first ACI Certification program, to recollect how the first program was developed—*John W. Nehasil, ACI Managing Director of Certification*

Unfortunately, his experience was common in the 1970s. ACI deliberated this issue for many years, trying to decide whether it was within the scope of ACI's mission to develop and administer knowledge and skills assessment programs.

In 1978, the issue reached critical mass when the ACI Board of Direction charged the Educational Activities Committee (EAC) with developing a proposal for a certification program. In developing the proposal, EAC adopted the approach that ACI would assume a leadership role in "establishing and maintaining such a program (Certification) for the purpose of improving and regulating the quality of concrete." In support of developing a certification program, then-ACI President John McLaughlin pointed out in his January 1980 *Concrete International* President's Memo, that though barbers must participate in a training and examination program to become qualified to a set of standards, "...I have no such assurance with respect to the qualifications of technicians who are, to a large extent, in day-to-day control of the quality of concrete construction or projects in many parts of the United States."

After much debate and compromise, the Board authorized the formation of ACI Committee E 902, Certification. The committee was chaired by Herman G. Protze III (of W.R. Grace), with ACI Director of Education Harold W. (Bud) Gilley serving as Secretary, and was populated by 14 members from universities, engineering, inspection and testing companies, associations, and admixture and cement manufacturers representing all regions of the U.S. This group began the task of

determining the content, form, and delivery method of the first ACI certification program.

THE AGE OF ENLIGHTENMENT—DEVELOPMENT OF THE FIRST ACI CERTIFICATION PROGRAM

At the first ACI Committee E 902 meetings, several issues were quickly agreed upon:

1. The certification program would be national in approach, and would not address regional testing procedures.
2. Program participants would be required to demonstrate that they can use the equipment correctly to perform the procedures and tests.
3. The program would cover sampling concrete, making test cylinders, and performing the slump, unit weight,



Individuals certified as Concrete Field Testing Technician—Grade I have demonstrated the knowledge and ability to perform and record the results of basic field tests on freshly mixed concrete, including slump flow testing (photo courtesy of the Ohio Ready Mixed Concrete Association)

- and air content tests (the temperature test was at first optional).
4. Program participants would need basic knowledge of concrete.
5. The examiners and proctors administering the certification program would be required to know the correct procedures and have a background in the concrete industry.
6. The tests and procedures would follow American Society for Testing and Materials (now, ASTM International) standards.

Following assembly of this framework, ACI Committee E 902 began to sweat the details:

Air content tests

With most of the U.S. using the pressure method to determine air content and few areas regularly using the volumetric method, the Committee agreed that many technicians might never see, much less perform, a volumetric air test. ACI Committee E 902 discussed whether it would be fair to require all participants to conduct the volumetric test. Some argued that the test should be optional, with areas routinely using porous or lightweight aggregates free to require it, while areas typically not using these types of aggregates would be free to eliminate it.

During the deliberations, it was observed that a technician with an ACI certification may move to another area where the volumetric air test is used. ACI Committee E 902 then decided that to be an effective national certification, ACI's certification program must include *both* air tests. It is interesting to note that after 25 years, this issue is still debated, particularly as the program continues to expand beyond the borders of the U.S.

Knowledge level of the technician

This proved to be one of the most hotly debated issues and took almost 2 years to resolve. Some ACI Committee E 902 members believed that an ACI-certified technician should possess knowledge of the principles of concrete technology to at least the level of the *Concrete Primer* (ACI Publication SP-1) or *Design and Control of Concrete Mixtures* (a Portland Cement Association publication). The opposing philosophy was that a certified technician needed only to correctly perform the designated concrete tests and report the results.

Many committee members employed technicians who were highly skilled and capable of performing nondestructive tests, mixture adjustments, reinforcement and forms inspections, and other concrete testing and inspection work. But many also had technicians just starting their careers, who knew very little about concrete and had no formal education in concrete technology. The question really centered on at what level ACI should certify:



ACI certification training is conducted in Spanish throughout Latin America

technicians who demonstrate knowledge and ability to conduct the basic tests on fresh concrete and report the test results or expert technicians whose knowledge and skills extended beyond this level of competency.

Again, following much debate, this first certification program was established as an entry-level program, with the committee deciding that future opportunities to formulate higher-level programs would exist should this program prove successful. As an entry-level competency assessment, the ACI Concrete Field Testing Technician-Grade I (FTT) program was formulated to require technicians to know if they have the right equipment; be able to handle the concrete correctly before, during, and after the test; be able to run the test correctly; perform the test at the correct time and within the specified time limits; record the results correctly; and communicate those results to the appropriate people on the job site.

In deciding upon this approach, ACI Committee E 902 agreed that the FTT program would *not* test technicians on knowledge or ability related to issues such as adjusting the concrete so that slump would meet specifications, how changes in materials can influence slump, whether concrete with slumps outside of the limits of the specifications can be placed, and mitigation of other noncompliance issues.

Training requirements

Once the committee agreed on the knowledge level expected of technicians, they then moved on to discuss the training level required to become certified. ACI Committee E 902 recognized that many testing laboratories, departments of transportation, ready mixed concrete associations, and other organizations already offered well-developed training programs that were suitable to prepare individuals for the ACI certification exams. ACI Committee E 902 further realized that establishing a standard training requirement could unnecessarily complicate the certification process and preclude a course of self-study. It was therefore decided that formal training would not be a certification requirement, but that it would be encouraged in recognition that training improves participants' chances of passing exams. This decision positioned ACI to focus on developing the certification test materials, policies and procedures, and allowed other organizations and individuals the flexibility to develop training programs to address not only the national program's scope, but also regional and local needs.

Training programs are now available from a variety of sources such as colleges/universities (some civil engineering programs require the ACI FTT Certification exam as part of their materials courses), highway departments, testing laboratories, materials suppliers, trade associations, ACI chapters, unions, and governmental agencies. Most ACI Local Sponsoring Groups

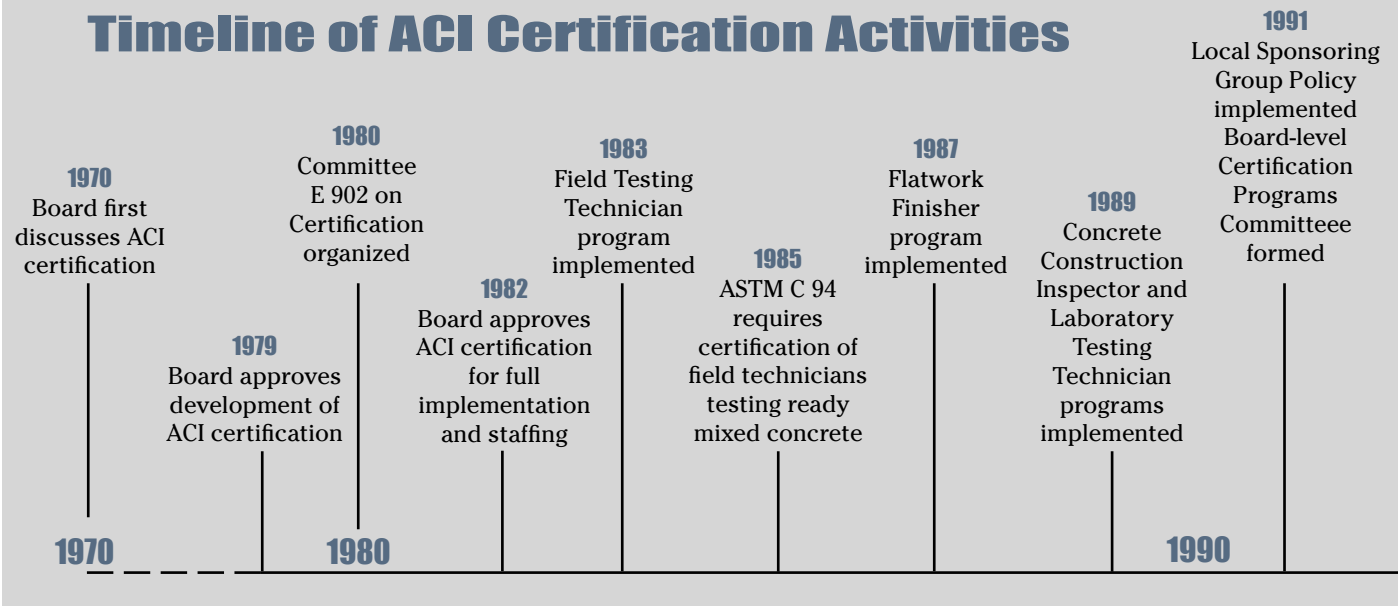


Students as far away as Mongolia have also benefited from ACI certification training



An ACI Shotcrete Nozzelman certification exam in progress

Timeline of ACI Certification Activities



(LSGs—organizations formally authorized to conduct ACI certification exams) offer some form of training.

Although the ACI certification program does not require participants to complete training for certification, some LSGs have assessed their resources and determined that they cannot afford to allow unprepared participants to attend exam sessions. They have subsequently initiated local policies that require participants to complete and prove evidence of training before being allowed to take the exams. In addition to ACI's *Technician Workbook for Certification of Concrete Field Testing Technician—Grade I, CP-1*, other training CD-ROMs, DVDs, and videos are available from third-party developers to aid in either instructor-led training or self-study programs.

Training for certification has become very dynamic with many examples of successful programs that can be used as templates for new programs. Regional Certification Roundtable discussions for LSGs are held twice each year in conjunction with ACI Chapter Roundtables (the next one will be held in Houston, TX, on October 27-28, 2005) and are excellent opportunities to learn how training is being offered. If you're invited to one of these roundtables, I highly recommend that you attend!

Responsibility for administering the certification exam

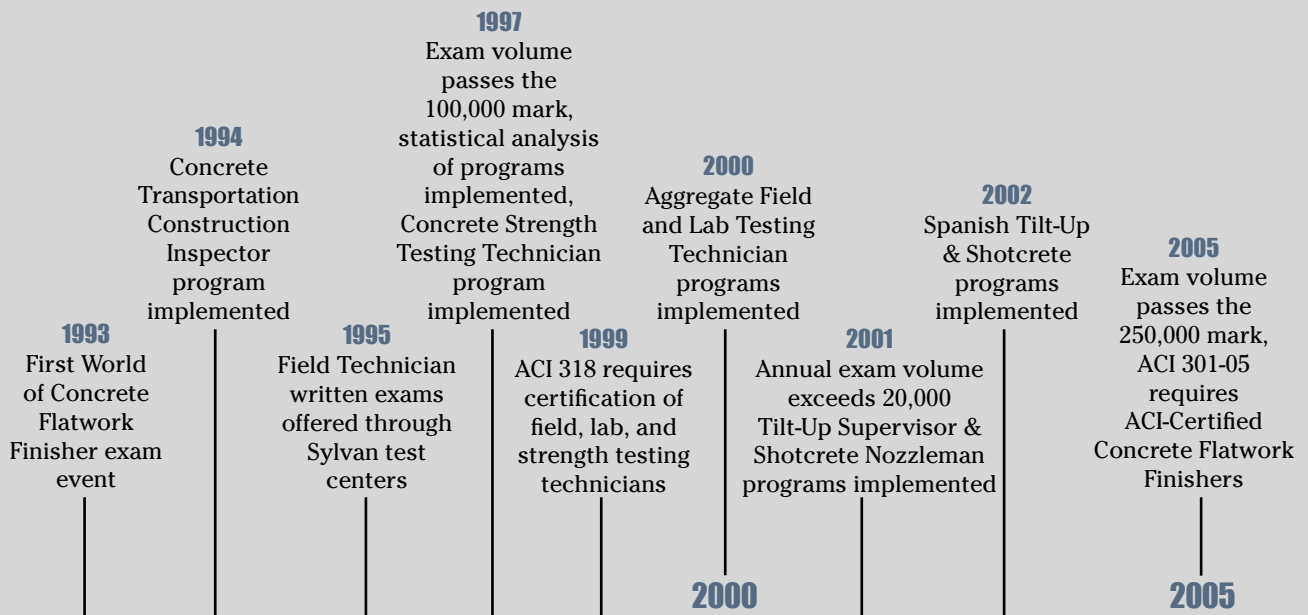
The committee agreed that a responsible person, knowledgeable in concrete technology, should administer the exam. However, ACI Committee E 902 had to spell out the minimum qualifications of the examiner to provide ACI certification staff with guidance on who to approve as

examiners. Since the Professional Engineering license is necessary to sign engineering reports, and it is a requirement that a laboratory have a Professional Engineer (ASTM C 329), it was decided that one criteria for approval as an ACI examiner would be that the individual be a licensed Professional Engineer (PE). Additionally, a second requirement was that this PE also be knowledgeable in concrete technology. In adopting these requirements, the committee felt that a PE, being bound by a Code of Ethics and knowing that signing a document carries legal implications, would take the responsibility for administering the exam seriously.

Potential examiners must complete and submit to ACI an application documenting background (education and work experience), knowledge of concrete technology, and evidence of their status as a Professional Engineer. Once approved by ACI, individuals are then eligible to serve as examiners under the auspices of an ACI-approved LSG. Each time an examiner conducts a certification program, he or she must sign a report that assures the program was conducted according to the program policies. This care in selecting the examiner and requiring them to work through a local organization has helped contribute to the success of the ACI certification program.

Time limits

Testing procedures and standards change, equipment changes, and not all people certified will test concrete on a regular basis. For these reasons, ACI Committee E 902 recognized that a certification should not be valid for life, but should require that the certified individual periodically renew certification through retesting.



The committee, without dissent, selected 5 years as the reasonable length for the FTT certification. After 5 years, the technician must repeat the certification process based on the then-current technical resources.

After 2 years of meetings and a great deal of ACI staff time, the ACI certification program for FTT was ready. No one was quite sure if it would be a success or if it would be met with indifference.

The first few years were indeed filled with mixed reactions. ACI was threatened at one point with a lawsuit alleging restraint of trade, while testing laboratories and others in the cement and concrete industry used ACI certification as a way to differentiate their personnel from their competitors. These employers recognized the market potential and wanted to be able to advertise that their technicians met ACI standards. Within 2 years, ASTM C 94, Standard Specification for Ready Mixed Concrete, required that concrete be tested by an ACI-certified technician or approved equivalent. This, along with many designers requiring in their specifications that concrete technicians must be ACI-certified (or approved equivalent), guaranteed the success of the program.

THE RENAISSANCE—SUCCESS OF THE ACI PROGRAM

The ACI Concrete Field Testing Technician—Grade I certification program was only the start. As this program became well established, new programs were developed using the FTT program as the template. ACI now offers 14 different certification programs. We have processed over 250,000 exams administered

through 100-plus LSGs operating internationally to participants residing in 44 different countries. It truly has become the standard way for field technicians, finishers, lab technicians, inspectors, and operators to prove their knowledge and ability to perform their jobs.

We must take our hats off to the individuals and committees in ACI who saw the need for concrete technicians to have a certification credential “like barbers” and to those who developed the first certification program. We must also take our hats off to the past ACI Boards of Direction who maintained support for the programs even when they weren’t sure it would be successful. We are especially proud of the ACI-certified personnel who work on our projects and provide high quality, state-of-the-art service to the concrete industry.

Selected for reader interest by the editors.



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