



## INSTITUTE CERTIFICATION since 1967

### CERTIFICATION RELIES ON A BODY OF KNOWLEDGE AND CONTINUOUS IMPROVEMENT

*AASHTO resolution endorses certification programs by technical institutes to ensure that products meet specifications and remain on cutting edge of improvements*

By William N. Nickas, P.E., and Dean A. Frank, P.E.,  
Precast/Prestressed Concrete Institute

The American Association of State Highway and Transportation Officials (AASHTO) has released a resolution supporting the specification of components for bridge construction that have been fabricated using certified quality-control and production procedures. The resolution additionally recognizes that a national technical institute is uniquely qualified to develop and deliver certification programs for its specific industry.

The resolution, endorsed by the AASHTO Subcommittee on Bridges & Structures during its recent 2009 general meeting, calls for recognition of “national industry certification programs for personnel, production, and quality control related to fabricated structural bridge components and processes.” It cites a number of reasons that technical institutes are the best option to ensure

that standards and certification procedures fully engage current research results and state-of-the-art techniques. This body of knowledge, which is constantly evolving, is the foundation of the technical institute and the institute remains its guardian.

The resolution was crafted to address the recent proliferation of “certification” programs, which has caused confusion in the marketplace. Private commercial concerns and groups from other industries have developed inspection programs—often based on standards published by technical institutes—that are touted as certification programs. They have led some specifiers to believe that their certification programs offer procedures and results compatible with certification by the industry technical institute.

The Federal Office of Management and Budget has stated that government agencies are encouraged to reference nonprofit, consensus-based standards and participate with these institutes, rather than create their own requirements. Programs that lack the foundations of strong research, the organization of technical committees to gather consensus, or the ongoing commitment to a continuous improvement process, will fail to meet the standards-development requirements of the American National Standards Institute.

Also, adoption of certification programs outside an industry’s nationally recognized technical institute effectively fragments the industry’s quality-assurance machinery and isolates groups of fabricators from immediate access to the industry’s official, continuously evolving body of knowledge. More than that, new certification programs

may create confusion by establishing parallel but inconsistent procedures, references, and benchmarks. An industry must be attuned to one national standard.

As the AASHTO resolution makes clear, technical institutes offer significant benefits that other certifying entities cannot provide (to read the complete resolution, see the sidebar on the following page). Using a certification program is important, it notes, because state departments of transportation above all else must ensure the safety of the construction team and structure users. The resolution further states that the best way to provide such assurance is through “consistency of results and quality”



Certification programs are much more than checklists used to conduct inspections. Effective, credible certification programs are based on an industry’s body of knowledge, from which all related industry standards and state-of-the-art procedures are derived. This body of knowledge tells us what the industry can do with a particular material, product, or system and explains how it can be done reliably. The primary purpose of a certification program is to help ensure that products are manufactured in accordance with specifications and customer expectations. It is therefore critical that certification programs be continuously linked as closely as possible to the source of the industry’s body of knowledge: the national technical institute.



# American Association of State Highway and Transportation Officials The Voice of Transportation A Resolution of the AASHTO Subcommittee on Bridges and Structures

**Whereas**, the State Departments of Transportation (DOTs) recognize that it is in the public interest to ensure that fabricated structural components made for highway, transit and pedestrian bridges are manufactured to the high standards to ensure safety through consistency of results and quality; and,

**Whereas**, the State Departments of Transportation rely on proven certification programs in accepting fabricated structural components, and such certification programs have as their goals: training and evaluation of personnel, evaluation of production and quality control procedures as measured against national industry standards and agency specification requirements; and,

**Whereas**, it is accepted that nationally recognized technical institutes are comprised of membership representing all segments of bridge stakeholders and develop consensus standards for their industries; sponsor relevant research; draw upon and energize established technical committees; publish technical training, design, and standards manuals; have staff positions held by engineers and subject experts; and qualify and monitor their third-party independent auditors who are trained to pro-

vide critical assessment and bring consistency to their work; and,

**Whereas**, such certification programs have as additional goals, continuous quality improvement, the identification of best practices, the discovery of potential problems and issues and the dissemination of these topics to the entire industry; and,

**Whereas**, AASHTO bridge design and rating specifications are developed and calibrated to levels of safety provided by the quality inherent to such industry certification programs; and

**Whereas**, reductions in DOT staff and the wider use of performance-based construction specifications will lead to increased effort to evaluate and assess quality; and,

**Now, therefore, be it resolved** on the occasion of the 2009 General Meeting of the AASHTO Subcommittee on Bridges and Structures, the members in attendance express their support for and endorse national industry certification programs for personnel, production and quality control related to fabricated structural bridge components and processes.

produced by using procedures and personnel certified by a technical institute.

## PRECAST CONCRETE WELL POSITIONED FOR QUALITY

The precast concrete structures industry, in particular, benefits from having a strong, nationally recognized technical institute with a long-standing quality assurance program. The Precast/Prestressed Concrete Institute (PCI) continuously supports, monitors, and incorporates improvements in design methods, materials, mixtures, fabrication techniques, environmental

impact, and other factors into its ongoing programs. The PCI Certification program, far from standing alone, is part of a broad quality system that derives from the industry's most comprehensive, up-to-date body of knowledge. This system utilizes the tools of publication, education, and communication to convey this knowledge within the industry. Quite simply, it has no match within the industry it serves.

*As the AASHTO resolution makes clear, technical institutes offer significant benefits that other programs cannot provide.*

## WHITE PAPER OUTLINES ESSENTIAL COMPONENTS

PCI has joined with the American Institute of Steel Construction (AISC) to produce a joint white paper on the clear advantages of a certification program operated by an industry's technical institute, elaborating on and adding to the points specified in AASHTO's resolution. Twelve elements were outlined in the white paper as critical to a successful certification program.

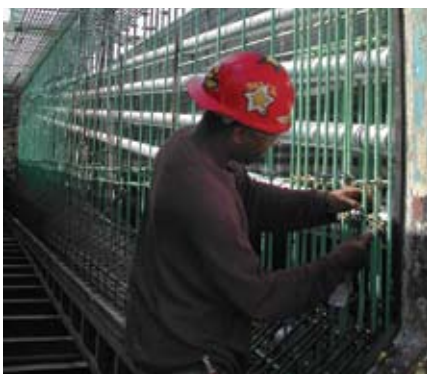
**1. Industry Standing.** Technical institutes serve as the principal body of knowledge within their industries. They facilitate the exchange and encouragement of new ideas and test those concepts across the full spec-

trum of stakeholders. Their programs are based on decades of experience. As the collaboration between PCI and AISC indicates, they can also join together to assess noncompetitive issues that aid their industries, thanks to the all-encompassing scope of their membership and responsibilities.

**2. Clearly Stated Purpose.** Certification programs run by not-for-profit technical institutes state their purpose and foundation transparently. There is no hidden agenda in their direction, and no individual person or company stands to profit from their programs.

**3. Broad Professional Involvement.** A technical institute's membership and committee participation reflect a diverse mix of industry professionals, including engineers, producers, and academicians, whereas a trade association is generally dominated by a single interest. This diversity ensures that every perspective is considered and best practices are identified. Documents and other knowledge products created by the organization are subject to review by committees representing all interested parties.

**4. Governance & Consensus.** Technical institutes are governed by boards with elected officers and members having no ownership interest. They have formal, consistently applied procedures for making decisions and achieving consensus. This formalized process al-



A worker adjusts reinforcement in a complex 120-in.-deep girder for the Illinois Toll Highway Authority.  
(Photo: Prestress Engineering Corporation, Prairie Grove, Ill.)



lows a technical institute to create and apply a comprehensive quality system in a fair and balanced manner that reflects a true consensus of the industry and its professions.

5. **Research.** Technical institutes base their programs on a body of knowledge that includes formal and informal research activities that address current industry challenges, emerging technologies, and innovative practices. These activities are ongoing, and new and improved knowledge is directly applied to the institute's quality programs, in many cases well before being incorporated into published codes and standards. Institutes also monitor and disseminate results from the global independent-research community, keeping the industry up to date on all types of data. The institute's research credibility is evidenced by its ability to attract funding and collaborative assistance from outside sources, including corporations, universities, and other associations. These vetted efforts further expand the available knowledge base and improve the effectiveness of the institute's certification and quality programs.
6. **Validation.** Certification programs developed by technical institutes provide a rigorous review process that includes oversight committees and review panels of experts and stakeholders. Every element is examined and documented to ensure that it helps meet the goal of achieving high quality.
7. **Dissemination.** Technical institutes have access to a wide range of com-

munication media that can immediately alert the industry to concerns, best practices, regulatory issues, and technical matters. They also offer educational programs with qualified instructors to spread new information and explain new developments.

***PCI joined with AISC to create a white paper delineating the benefits produced by a certification program operated by a technical institute.***

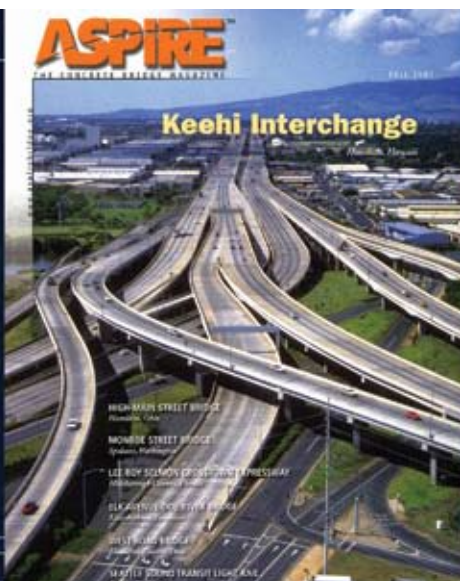
8. **Certification of Personnel.** A comprehensive quality system must validate the competence of the personnel involved with quality control and other key activities. Quality is not an end point but a continuous examination of best practices that improve quality performance consistently over time. A technical institute ensures that both plant personnel and auditors have the capabilities to review project requirements, audit records, interview personnel, and observe practices and equipment to ensure that procedures reinforce the quality mission.
9. **Certification of Fabrication Process.** The primary focus of a manufacturing certification program is to ensure fabrication of high-quality components that meet specifications on a consistent basis. Technical institutes base their inspections on their own promulgated



As precast products evolve into more-complex systems, the demands for quality assurance increase accordingly. (Photo: Summit Engineering Group Inc., Littleton, Colo.)

standards, procedures, and research, creating a foundation for inspectors and fabricators to understand the reasoning behind the requirements.

10. **Independent Audits.** PCI's certification program requires periodic on-site audits by independent, technically qualified, and professionally accredited personnel who have no financial or employment interest in the institute or the fabricators being audited. Auditor-qualification programs verify the quality and effectiveness of the individual auditors themselves, and include periodic training to remain current with evolving quality standards.
11. **Feedback & Recourse.** Technical institutes can take advantage of their












An institute's publications and periodicals are an effective means to provide current information and technology to stakeholders.

# Research, Documentation Underlie Best Programs

Research produced and openly disseminated by long-standing technical institutes, which fund and monitor ongoing studies and programs of all types, often serve as the basis for the creation of alternative, static, low-cost, checklist-based programs run by trade associations and for-profit organizations.

This is why code organizations turn to technical institutes when developing their own standards, as the institutes are the source of the critical research that underlies the procedures. For instance, the codification and calibration of the AASHTO LRFD Bridge Design, Construction, and Rating Specifications for fabricated bridge elements relied upon the standards, publications, practices, and personnel certifications noted below, all promulgated by technical institutes:

-  American Iron and Steel Institute (AISI) plate standards;
-  AISC for best practices and plant certification;
-  American Segmental Bridge Institute (ASBI) for best practices and grouting-personnel certification;
-  American Concrete Institute (ACI) for best practices and personnel certification;
-  ASTM International for materials and test standards;
-  American Welding Society (AWS) structural welding code, after-welding distortion tolerances, best practices, and personnel certification;
-  Concrete Reinforcing Steel Institute (CRSI) reinforcement dimensions, bending and placement standards, and epoxy coating plant certification;
-  PCI for best practices, plant certification, and personnel certification; and
-  Post-Tensioning Institute (PTI) for best practices, hardware standards, and personnel certification.

various communication media—including publications, technical conferences, educational programs, and auditor feedback—to gather and immediately apply enhancements to the audit process. A proper certification program includes formal procedures establishing consistent rules under which fabricators must address and/or can dispute identified nonconformances. The goal is to raise the bar on quality on a consistent, continuous basis and ensure that fabricators are accountable for quality, not to grade programs and declare a “winner.”

- 12. Continuing Commitment.** A vast array of stakeholders provide the foundation for technical institutes, which have provided long-term service to their industries and are supported through a variety of funding sources. This history provides a stable basis for certification programs and ensures that they will remain in place as consistent, continuously improving systems for assessing quality processes.

All of these certification benefits are provided at no expense to the owner and contractor, while creating efficiencies that can save the project time and money. Cost savings for no increase in price produces a return on investment that cannot be matched.

## SUMMARY

A reliable certification program cannot stand alone and successfully perform the important function of ensuring quality fabrication of components. It must be part of a comprehensive, continuously improving quality system specific to the engineered components being addressed and directly linked to the body of knowledge.

Commercial firms and other organizations can provide audit services, including preparation of checklists derived from published standards and requirements. Only a technical institute, however, can provide all of the essential components of a comprehensive quality system, intimately connected to the evolving body of knowledge for the industry it serves.

Industry stakeholders and project decision makers must recognize these distinctions and insist that they take advantage of the highest levels of quality assurance and quality control available to them. With their vision and support, technical institutes can build on their strong base and provide the market with consistent, continuously improving programs that ensure that best practices are used throughout the industry. Such systems are the only ones that ensure the highest levels of reliability and ultimate client satisfaction.

*William N. Nickas is managing director of transportation systems and Dean A. Frank is director of quality programs at the Precast/Prestressed Concrete Institute, Chicago, Ill.*

***Certification must be part of a comprehensive, continuously improving quality system specific to the engineered components being addressed.***

## MORE INFORMATION

To view the AASHTO resolution or the PCI-AISC white paper online, visit [www.pci.org](http://www.pci.org) and click on the “Quality Systems” icon on the homepage. The resolution and white paper are also available at [www.steelbridges.org](http://www.steelbridges.org).

To learn more about PCI quality-assurance programs and certification, visit [www.pci.org](http://www.pci.org) or contact Dean Frank, PCI director of quality programs, at (312) 583-6770 or [dfrank@pci.org](mailto:dfrank@pci.org). For information regarding AISC certification, contact Brian Raff at (312) 670-7527 or [raff@aisc.org](mailto:raff@aisc.org).

For general information about precast concrete bridges, contact William Nickas, managing director of transportation systems, at (312) 583-6776 or [wnickas@pci.org](mailto:wnickas@pci.org).