HPC Bridge Technology: Legistration, Delivery, and Teamwork

by M. Myint Lwin

The Federal Highway Administration (FHWA) takes this opportunity to congratulate the concrete industry on this inaugural issue of *ASPIRE*™—*The Concrete Bridge Magazine*. This is reflective of the progressive vision of the concrete industry to continuously look for ways and means to share invaluable experiences in concrete bridge construction to assure quality, durability, and economy. *ASPIRE* a quarterly concrete industry magazine, will feature articles containing useful information and innovative solutions from governmental agencies, consultants, and contractors on the use of concrete in bridges. The FHWA and the concrete industry have been strong partners in concrete and are looking forward to making *ASPIRE* the magazine to read for concrete bridge information and solutions.

In 1987, the United States Congress authorized a five-year $150 million Strategic Highway Research Program (SHRP) to develop and evaluate techniques and technologies to address the deteriorating conditions of the nation's bridges and highway-related structures, and to improve their performance, safety, durability, and efficiency. High performance concrete (HPC) was identified as one of the technologies that would produce significant benefits in bridge and highway construction.

To facilitate broad implementation of HPC, the American Association of State and Highway Transportation Officials (AASHTO) introduced the Lead States Program in 1995. This program used the experience of the States that were already implementing HPC to provide technical support and guidance to their peers in other States. The HPC Lead States Team for Bridges set a goal for all the States to have at least one HPC bridge project underway by the year 2000. HPC is now standard practice with most States. The FHWA and the industry were active members of the Lead States Team.

The FHWA forms and maintains the High Performance Concrete Technology Delivery Team (HPC TDT) chaired by Lou Triandafilou. The main objective of HPC TDT is to establish HPC as standard practice for every State DOT and to provide technical support on HPC practices in design, construction, and materials. The HPC TDT has a "Community of Practice" website at http://knowledge.fhwa.dot.gov/cops/hpcx.nsf/home. The site allows users to post questions on HPC, participate in discussions, share documents, and review work in progress. The HPC TDT has produced an *HPC Structural Designers' Guide* to provide information to structural engineers on using HPC in the design and construction of highway bridges and related structures. The guide may be downloaded from the above website.

The successful applications of HPC bridges will be featured in *ASPIRE*. The readers will find these articles interesting and full of information that can be put into practice. Two emerging concrete technologies will elevate HPC to the next higher level of performance. They are self-consolidating concrete (SCC) and ultra high performance concrete (UHPC). More about these two emerging concrete technologies will appear in future issues of *ASPIRE*.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) authorizes a research, deployment, and education program on improving bridge technology using high performance concrete. This program is funded at $4.125 million for each of fiscal years 2006 through 2009 to conduct research and deploy technology related to HPC. This is a part of the Innovative Bridge Research and Deployment (IBRD) Program established to promote, demonstrate, evaluate, and document the application of innovative designs, materials, and construction methods in the construction, repair, and rehabilitation of bridges and other highway structures. The IBRD program is funded at $13.1 million for each of fiscal years 2005 through 2009. The funding for the HPC program comes from the IBRD program.

The FHWA in partnership with the National Concrete Bridge Council, States, consultants, and academia has developed a research, deployment, and education plan to carry out the intent of SAFETEA-LU, the FHWA performance objectives, and the needs of the highway bridge community. The plan was developed based on needs identified by the FHWA, AASHTO, the Transportation Research Board, industrial groups, and other stakeholders. The research and development component of the plan includes high performance lightweight concrete material and structural properties, deck curing to control cracking, and shear of nonprestressed elements. On the deployment side of the plan, the FHWA focus includes a manual of HPC practice, integral abutments and jointless bridges, HPC design and rating examples, and evaluating and extending the service life of post-tensioned bridges. For continued education, the FHWA supports the transfer of technologies through workshops, conferences, showcases, training courses, and newsletters.

With the funding for HPC bridge technology research and deployment from SAFETEA-LU, the FHWA is providing leadership by engaging the highway bridge community in advancing HPC to new frontiers in the next three years.

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