

Accelerated Bridge Construction – Designing for Contractors

By Jim McMinimee and Mary Lou Ralls



Accelerated Bridge Construction (ABC) has taken off in the United States in recent years. This is primarily due to two interrelated factors:

- 1) The need to replace deteriorated bridges, and
- 2) The need to maintain traffic flow during peak traffic hours.

Hundreds of ABC projects have been built in various states across the country. These projects have been initiated by bridge owners and contractors alike. The ABC initiative is expected to move from innovation to standard practice because of the increasing age of the nation's bridge inventory and the need to maintain traffic flow and economic vitality.

The Utah Department of Transportation (UDOT) has completed 127 bridges using different ABC methods, and is transitioning to ABC as standard practice by 2010. The ABC methods include everything from prefabricated elements such as decks, to moving entire structures using self-propelled modular transporters (SPMTs). Why is UDOT doing this? Because Utah bridges are aging and the citizens of Utah have voiced their concerns to have reliable travel times and reduced impact as these bridges are upgraded. The UDOT response has included a close working relationship with contractors and others in the construction industry.

UDOT began its ABC implementation with the reconstruction of Interstate 15, in time for the 2002 Winter Olympics. UDOT worked with the contractor, Kiewit, on that design-build project to complete the entire 17-mile corridor in just four and a half years, ahead of schedule. Partial-depth, precast, prestressed concrete deck panels and other ABC methods were used on the project to speed construction. UDOT has continued to work with contractors and other industry partners since then to improve ABC methods and specifications, and to speed up bridge replacement. The fastest UDOT replacement to date was the 3300 South Bridge over I-215, which was replaced in under 16 hours by Ralph Wadsworth.

UDOT's ABC implementation has relied on industry collaboration to be successful. Obtaining contractor input in the early stages of ABC projects leads to more cost-effective, long-lasting bridges with early completions. UDOT uses several contracting methods to obtain this early input. Design-build has been used on a number of projects, as has the Construction Manager General Contract (CMGC) method. In the

CMGC method, UDOT hires a contractor at the start of the project to work with UDOT in-house or consultant designers to develop the plan sheets. The contractor then has the first opportunity to bid the project. UDOT and contractors agree that early contractor participation in design minimizes risk and improves schedule.

UDOT has accumulated a number of lessons learned in the past decade that relate to designing ABC projects to facilitate contractor operations. Many of these lessons involve identifying and managing risk. An example is the UDOT SPMT Manual which is available on its website at www.udot.utah.gov/. This manual includes sample checklists that were developed to help manage the risks of moving bridges with SPMTs. The checklists identify required actions and responsible parties, and are modified as needed to suit the project and site-specific conditions. They have become a resource and a way to talk with contractors about risk.

Another way that UDOT collaborates with its contractors is to post significant ABC information. Contractors can find a bulleted list of links to myriad ABC details at the website. Included is UDOT's ABC Decision Flow Chart that shows how the agency determines when to use ABC versus traditional delivery methods for its bridge projects. Also included are UDOT ABC manuals for various prefabricated components and SPMT moves, as well as related drawings and requirements for acceptance, documentation, measurement and payment. In addition, the site provides documentation on UDOT ABC conferences and workshops, and SPMT bridge move projects since 2007.

By posting in-depth ABC details on the website, UDOT is opening its doors to contractors and showing them that this is the new way of doing business in Utah. Contractors are encouraged to access UDOT ABC manuals, drawings, specification language, and details from past projects, and let them know of any concerns. This focus on communication and collaboration is expected to increase contractor understanding and comfort with ABC, and lower the perception of risk.

The UDOT mission statement is "Quality Transportation Today, Better Transportation Tomorrow." Its strategic goals focus on taking care of the existing system, making the system work better, improving safety, and increasing capacity. UDOT takes its mission and strategic goals to heart. The construction industry and ABC help UDOT realize these goals resulting in the efficient and effective movement of people, goods, and services within and through the state. ■



Full-depth bridge deck panel placement.

Jim McMinimee is currently the Director of Project Development at the Utah Department of Transportation. Under Jim's direction the UDOT Project Development Division has implemented Design-Build and Construction Manager/General Contractor (CM/GC) contracting, Accelerated Bridge Construction, implementation of the Transportation Technician program and implementation of the GPS Network.

Mary Lou Ralls is an engineering consultant and principal of Ralls Newman, LLC in Austin, Texas. She was previously with the Texas Department of Transportation for 20 years, the last five years as state bridge engineer and director of its Bridge Division.