The existing Daniel Boone Bridge carries I-64, U.S. Route 40 and U.S. Route 61 over the Missouri River between St. Louis County and St. Charles County, Missouri and consists of two continuous truss bridges.

The original bridge was opened in 1932 initially serving travel in both directions. The original bridge was switched to two lanes of westbound traffic in 1989 when the new eastbound bridge opened. In 2001, the Missouri Department of Transportation (MoDOT) eliminated the shoulders westbound, narrowed the lanes and expanded to three lanes. The original bridge will meet its demise in 2015 once a new bridge is built.

In 1989, the MoDOT opened the new eastbound bridge next to the 1930’s bridge as a result of increased congestion. The bridge was initially built for two eastbound lanes with shoulders but in 2001, the shoulders were eliminated and the bridge was expanded to four lanes at the same time the original bridge was increased to three lanes. After some rehabilitation, this bridge will eventually serve westbound traffic when the new eastbound bridge opens.

Design-Build Project Takes Off
A new girder bridge is currently under construction upstream, or to the west of the two existing bridges. Once it is done, the new bridge will serve eastbound traffic. The project was approved on December 10, 2004, with funding unveiled in 2011. The MoDOT awarded a contract to the Walsh-Alberici Joint Venture (JV) team with designer Burns & McDonnell in July 2012, and construction began in the fall of 2012. It is estimated that traffic will be routed onto the new bridge by late 2014 with all work completed by the end of 2015. A bike and pedestrian shared-use path will also be added to the new bridge. This is a design-build project with a design and construction schedule duration of three years. The award was proposal-based. One interesting idea in Walsh-Alberici’s proposal was to link the Katy...
Trail on the St. Charles County side of the river to the Monarch Trail on the St. Louis County side, through the new Shared-Use Path on the new bridge and a new path that goes around an old quarry on the St. Charles side. This turned out to be a huge selling point with the MoDot and the public. Another selling point was Walsh-Alberici’s proposal to raise the Spirit of St. Louis Boulevard Bridge by jacking it up two feet to eliminate existing clearance issues on the river.

**Bigger & Better**

The new bridge will be 77'-0" (23 m) wide and 2,615'-0" (785 m) long, with the largest span being 510'-0" (153 m) over the navigation channel of the river. There will be 10 intermediate piers. All pier caps will be 77'-0" (23 m) long with a variety of heights and widths ranging from 7'-0" to 10'-0" (2 m to 3 m). The largest pier cap will require over 355 yd$^3$ (271 m$^3$) of concrete. Walsh-Alberici will place approximately 62,000 yd$^3$ (47,400 m$^3$) of concrete and approximately 5,475,000 lb (2,043,500 kg) of steel on this project.

The foundation system for all the piers is deep drilled shafts. The deepest shafts of the land piers go 120'-0" (36 m) down to bedrock. The largest shaft diameter is 11'-6" (3.5 m), designed for one pier with three shafts. At piers 8 and 9, temporary cofferdam structures measuring 68'-0" x 42'-0" (20.5 m x 12.5 m) were necessary to provide dewatering enclosures to construct the massive footings.

Walsh-Alberici chose to utilize EFCO® on this project because of our safety features, technical assistance, the finish provided by EFCO PLATE GIRDER® panels and the efficient cycling method. Most of the project team has used EFCO in the past and continue to use EFCO because of our relationship as well as EFCO’s quality products, engineering capabilities and field service assistance. They chose to use EFCO formwork for the footings, round columns, web walls and pier caps. The round columns ranged from 5'-6" (1.5 m) diameter to 7'-0" (2 m) diameter with maximum heights of 46'-0" (14 m), poured full height utilizing EFCO’s pour bridge connecting all three columns at each pier.

1 - Assemble cap safely on the ground, insert cage and install top yokes.  
2 - Crane pick and place into position landing on EFCO Support Brackets.  
3 - Install wood enclosures and place concrete.  
4 - Disconnect the non-hinged side of the soffit and allow the soffit to swing away.  
5 - With one pick of the crane, lift entire form setup from the finished cap and take it to the ground.  
6 - As the form is lowered, the soffit panels are folded back into position for cleaning and oiling.

Continued on page 12...

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I have used EFCO many times in the past and have always valued EFCO’s products and capabilities, but Paul Huisinga’s efforts and service on this project have made me a true believer in EFCO!

Jack Aitchison,  
Sr. Project Superintendent
Hinge Soffit Solution

EFCO supplied PLATE GIRDER® panels for the various web walls with bull nose ends. At piers 8 and 9, the formwork design had to account for the coffer dam strut layout. For the pier caps, Walsh-Alberici chose our PLATE GIRDER pier cap system with hinged soffit panels. EFCO designed one pier cap setup that could be used on all 10 pier caps. On 9 of the 10 pier caps, the entire pier cap formwork setup was flown into place in one complete pick. The single pick weight was approximately 78,000 lb (29,100 kg). This same setup can be stripped and cycled in one pick because of the hinged sofit design.

Walsh-Alberici chose to use EFCO’s Hinged Soffit solution allowing them to strip the cap in one pick.

Disconnecting the soffit form at the non-hinge side allows the soffit to swing away from the finished cap. One pick of the crane and the entire form is headed to the ground.

As the form is lowered, the soffit panels are folded back into position.

The ground crew help to guide the cap form back onto the concrete barriers to get it ready for the next set of columns.

The crew can now reattach the pipe braces and square up the cap.

With the cap form on the ground and the hinged soffit secure, the form is cleaned, oiled and ready to reset for the next pour. In some cases, the contractor will fly the rerod cage inside the form.

The safety aspects like the fall protection built into the design of the EFCO system and the finish quality fit well within our culture of safety and quality.

Husam Arabi,
Assistant Project Manager

Joe Sannasardo ........ Sr. Project Manager
Rob Hartwell ............... Sr. Project Manager
Husam Arabi ............ Assistant Project Manager
Ethan Kaufman ........ Assistant Project Manager
Jack Aitchison .... Sr. Project Superintendent
Dave O’Dell ................... Superintendent
Joe Fredrick ................. General Foreman
Gary Donaldson............... Foreman
John Lindsey ................. Safety Manager
Bret Forsyth ................. EFCO Territory Manager
Paul Huisinga .. EFCO Sr. Field Supervisor
Joben Grimmius ............ EFCO Engineer

A Few of the Bridges That Walsh Built with EFCO

ISSUE: SPRING 2004
I-74 Bridge
Peoria, Illinois

ISSUE: SPRING 2006
I-355 Des Plaines River Valley Bridge
Lemont, Illinois

ISSUE: SPRING 2006
Blennerhassett Island Bridge
Blennerhassett, West Virginia

ISSUE: SPRING 2006
War Memorial Bridge
Peoria, Illinois

ISSUE: SPRING 2008
Allegheny Bridge
Pittsburgh, Pennsylvania

ISSUE: SPRING 2011
Monongahela Bridge
Monogahela, Pennsylvania