

New Bridge



The Loudoun County public school district is quickly becoming Northern Virginia's second-largest school system. In 2007, the county projected enrollment to reach 53,000 students. To keep pace with the rapid area growth, the Loudoun County School System had a goal to open three new elementary schools and a middle school before the start of school in the fall.

The first day of school in the booming district is one major cause of post-Labor Day traffic increases across the Washington metro area. Loudoun County school officials estimated 721 buses would be on the road the first day of school in August. Thousands of parent drivers also add to the yearly traffic increase.

To support the opening of one of the new schools, Rosa Lee Carter Elementary, developers needed a bridge for a road leading to the new facility. A precast arch bridge was proposed, submitted and approved by the Virginia Department of Transportation, leaving less than five months to provide a finished bridge.

Production of the twin-leaf precast BEBO arch units began immediately in order to meet the aggressive early May deadline. Once produced, the precast pieces were delivered to the job site on 24 total trailers.

The triple-span E-Series bridge includes a center 72-foot-span cell and two outer 60-foot spans. The different spans were combined to accommodate major floodplain and hydraulic requirements of Broad Run Stream for the county.

Site challenges during installation of the structure threatened to delay the project, but effective solutions from the contractor teams helped keep the project on track. During footing construction, Westlind Construction provided some unique dewatering solutions in the midst of heavy rainfall conditions to save the excavation and prevent delays the rain could have caused.

"A very tight schedule made this project a challenge," says Mike Carroll of William A. Hazel. "If not for CONTECH and our erection subcontractor, Westlind, we would not have been able to perform to our owner's expectations."

Precast end treatments, such as headwalls and wingwalls, were a preferred solution to cast-in-place to meet the schedule for the project. Portions of the walls were very tall and outside the limitations of the typical precast systems available. Therefore, the bridge team engineered a hybrid headwall system consisting of precast wall panels, cast-in-place counterfort walls and a traditional precast

Gets Children to School on Time



wingwall system to meet the design requirements and keep installation time minimal.

Varying non-erodible rock elevations required the engineering team to design both shallow and deep foundation systems. Shallow spread footings beared at the higher rock elevations, while 48-inch-diameter caissons to rock were used at the lower rock elevations. The foundation design also needed to avoid impacting an existing 60-inch sanitary sewer line under the east cell and a proposed 60-inch sanitary sewer realignment under the west cell.

Toll Brothers also wanted the bridge completed for traffic into their Loudoun Valley Estates development. The upscale development contains luxury houses in a rural setting with public parks, hiking and biking trails, pools and athletic fields.

“Responsiveness and cooperation were an integral part of a team effort in successfully completing the project three weeks ahead of schedule,” says Jon Cannizzo, PE, land development manager for Toll Brothers.

The success of the project took coordination and dedication from the teams from Westlind Construction, William A. Hazel, CONTECH, Toll Brothers and Bowman Consulting. Rosa Lee

Carter Elementary opened in August 2007, without concern over road construction or traffic delays and with an impressive, new bridge to cross. ■ 101



Using twin-leaf precast BEBO arch units, developers completed the Loudoun County public school project three weeks ahead of schedule.

