Precast Concrete Foothills Bridge No. 2 Links to Majestic Views of Great Smoky Mountains in Blount County, TN

Construction of the $25 million precast concrete Foothills Bridge No. 2 was instrumental in completing the 75-mile long Foothills Parkway in Blount County, Tennessee. Authorized by Congress in 1944, the parkway provides vistas of the Great Smoky Mountains National Park. It is administered by the National Park Service (NPS), which partners with the Federal Highway Administration (FHWA) to develop infrastructure within national parklands.

This exceptionally rugged 1.6 mile stretch of parkway traverses steep mountainsides and presented serious logistical challenges. Site access was limited to the beginning of the bridge and via the steep and rugged terrain along the mountain.

The Eastern Federal Land's goal of rapid completion and minimal impact to the forest in the rugged terrain led contractor Bell & Associates Construction to choose precast for the Foothills Bridge No. 2. The precast fabricator's ability to manufacture to precise tolerances allowed construction of a bridge with complex geometry that blends into the environment by following the contour of the mountain," said Jeremy Mitchell, Bell & Associates Construction project manager.

The concrete was colored to match the rock to naturally blend into the landscape. It also helped address the uneven mountain terrain. "The mountain landscape dictated a bridge geometry with an undulating footprint and up to 8 percent reversing cross slope on an 8 percent grade, so every segment we produced was unique in its geometry," said Rick Merritt, Ross Prestressed Concrete general manager.

To address construction challenges along the steep terrain and meet the project schedule, the designers chose a new construction methodology that incorporated a temporary work trestle. It provided access along the entire bridge alignment and could be reconfigured as work shifted from foundation and precast concrete segment piers to superstructure segment erection.

Continued on back
“Enhanced durability measures used on Foothills Bridge No. 2 included a posttensioning design for no longitudinal or top slab transverse tension under service loads and corrosion protection system to enhance durability. The innovative design-build approach successfully achieved the goals of the NPS, FHWA, and EFLHD. Environmental impacts were limited to selective tree toppings and minimized disturbance of fragile top soils,” said Corven.

“This project was unique both to our company and this area of the country,” said Merritt. “High performance concrete was employed, resulting in a structure with a 75-to100-year expected life span, ensuring many future generations will enjoy the magnificent beauty of the Great Smoky Mountains from the vantage point of Bridge No. 2.”