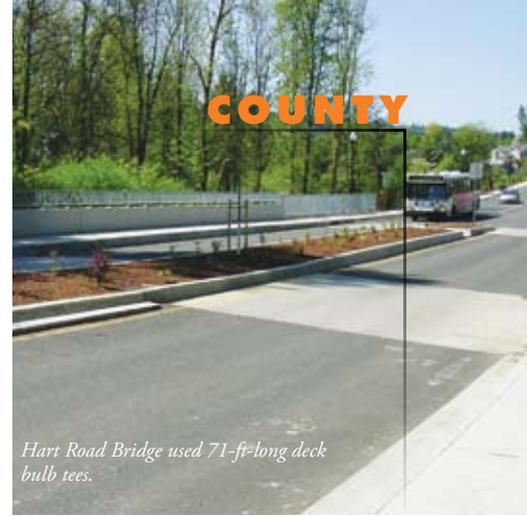


CONCRETE BRIDGES IN WASHINGTON COUNTY, OREGON

by Jim Perkins, Washington County, Ore.



Washington County, Ore., just to the west of Portland, has been very fortunate that its citizens have supported several serial levies since 1986 to improve major streets. With that funding, the county has been replacing one to three bridges each year. Currently there are 187 bridges in the county, with 105 of those having concrete superstructures and 75 being timber structures. The lengths range from 15 ft to 684 ft.

The majority of bridge replacements have used concrete bridge components. Greg Clemmons, the county operations engineer, says that he prefers concrete bridges for their longevity, ease of maintenance, and versatility.

In 1999, the county designed the Germantown Road Bridge consisting of 65-ft-long precast, prestressed concrete box beams. Prior to the project, Oregon performed a bat study. It noted that the Washington County had one of the lowest bat populations and that concrete bridges are prime bat habitats. The county devised a simple means of providing bat habitats on this bridge. It consisted of a short piece of plywood placed on the side of the precast form during casting. This creates wider joints or roosting

slots when the beams are abutted in the bridge. The design is cheap and has now been used throughout the state.

In 2004, the county designed the Hart Road Bridge to replace an existing culvert. The roadway consisted of two lanes with a planted median that continued across the bridge. The bridge was constructed using 71-ft-long deck bulb tees with an asphalt overlay. Deck bulb tees are precast, prestressed concrete bulb tees with an integral full-depth deck cast during prefabrication. The sections are abutted during installation. Bridge construction is accelerated and simplified since there is no deck to cast on site.

In 2007, the county replaced the Greener Road Bridge, which was a timber structure. The bridge is in a remote area of the county and is the only public access for a dozen homes and a business. The new 82-ft-long bridge consisted of precast, prestressed concrete box beams. To speed construction, the pile caps used precast concrete, but that is not what made the project so interesting. Site conditions required that one end of the bridge be fully superelevated, while the opposite end needed to have a typical center

crow. To accomplish this, each box beam had a different running slope and end bearing elevation. This added to the complexity of the precast cap and its construction. The precaster was heard to say, "I had many a sleepless night over that one!"

The county is now reconstructing 0.8 miles of River Road. This project includes replacing an existing 125-ft-long, timber, multi-span bridge with a new 183-ft-long single span bridge. The new bridge consists of eight 84-in.-deep deck bulb tees supporting a cast-in-place concrete deck. The deck bulb tees are the longest non-segmental, precast prestressed beams in Oregon. Construction is to be completed this year.

The county looks forward to continuing to replace its old deficient bridges and to constructing more concrete bridges due to their long life and low maintenance performance. Washington County is excited about its efforts in being innovative in meeting the many challenges it faces in this work.

Jim Perkins is a structural engineer with Washington County, Ore.



Greener Road Bridge used precast concrete pile caps to speed construction.



River Road Bridge is a 183-ft-long single span bridge that uses 84-in.-deep bulb tees supporting a cast-in-place concrete deck. The deck bulb tees are the longest in Oregon.