



■ Bridges



DYWIDAG-SYSTEMS INTERNATIONAL



DSI Network: www.dywidag-systems.com

Reference Details:

Client Maryland Department of Transportation, Federal Highway Administration, Virginia Department of Transportation, USA

+++ General Contractor Joint Venture American Bridge/Edward Kraemer&Sons, Alexandria, VA, USA / Virginia Approach Constructors (Granite & Cormann Joint Venture), Alexandria VA / Potomac Constructors (American Bridge, Edward Kraemer&Sons, Trumbull Joint Venture), Oxon Hill, MD, USA +++

Architect/Design Parsons, Baltimore, MD, USA +++ **Consulting Engineers** Potomac Crossing Consultants, Oxon Hill, MD, USA

DSI Unit DSI USA, Business Unit Post-Tensioning, USA

DSI Services Supply of DYWIDAG Post-Tensioning Systems: 4,520 anchorages 19-0.6"; 3,560 anchorages 27-0.6"; 2.65 mil. m strand Ø 0.6"; 36,000 m threadbars, 36 mm Gr. 150; 22,250 m threadbars, 46 mm Gr.



DYWIDAG Multistrand Tendons secure new Interstate Bridge across the Potomac River near Washington, D.C.

Replacement structure for overloaded Woodrow Wilson Bridge on the Interstate I-495/I-95, Washington, D.C., USA

The I-495/I-95 Capital Beltway, one of the busiest east coast interstate highways, is a 103 km stretch of interstate that circles Washington, D.C.. At its southernmost point the highway spans the Potomac River via the 44 year old Woodrow Wilson Bridge.

The current traffic of almost 200,000 vehicles per day threatened the capacity of the existing bridge which had been designed for a capacity of 75,000 vehicles per day. In addition to congested lanes, the drawbridge had to be raised about 265 times per year due to its limited clearing height for ship traffic. Therefore the decision was made to replace the old Woodrow Wilson Bridge with two parallel 1,850 m long bridges in each driving direction.

Each of the new bridges will have room to accommodate 6 lanes of traffic plus shoulders and will be 6 m higher than the old bridge. This new total clearance of 21 m will only require the bridge to be raised about 80 times per year based on today's ship traffic which will allow for 70 percent fewer bridge openings and subsequent traffic interruptions.

This 2.5 billion US Dollar project, which was begun in 2003, also includes the construction of four interchanges in order to provide better traffic flow onto the bridge. The project area is a 12 km corridor beginning in Maryland and connecting to Virginia by the new Potomac River Bridge. After the initial bid for the bridge came in approximately 75% above the engineer's estimate, the project was split into three contracts and re-bid. Contract 3A includes four side by side double leaf bascule spans on each side and 12 cast in place V-shaped legs connected by tie girders. To achieve the required stability all structural elements had to be heavily post-tensioned.

Contract 3B relates to the mostly overland segment from the Virginia shore to the bascule. Contract 3C, the approach from Maryland, is mostly over water. Both contracts together require the construction and post-tensioning of a total of 60 V-shaped bridge piers. The bridges are built using precast segmental construction. The precast elements for the bridge deck and the piers are produced in two precast yards set up on site. The requirements for the posttensioning material were extremely strict and incorporated many of the requirements of the Florida Department of Transportation specification such as plastic ducts and field air pressure testing of the tendon systems.

DYWIDAG-Systems International USA supplied the post-tensioning material and related equipment in compliance with the strict quality requirements for all 3 contracts. In addition, DSI provided some unique solutions to construction issues such as radius bent bars. The pre-bent bars allow for easy installation of the bar system through the curved section of the arches and eliminate the sharp bend the bar would experience if straight bars were used. Another DSI proposal concerned the use of friction-welded transition couplers for the temporary post-tensioning facilitating the connection between the cold-rolled threaded bars installed in the arch base and the DYWIDAG Bars used for the arches. DSI



150; Accessories and rental of equipment.

also supplied prefabricated bar and strand tendons for the permanent posttensioning of the arches.

In spring of 2006 a major milestone was reached with the opening of the outer bridge. The complete crossing is scheduled to open in mid 2008, followed by the demolition of the old Woodrow Wilson Bridge.

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