I-64 Hampton Roads Bridge-Tunnel Expansion

Owner:
Virginia Department of Transportation (VDOT)
Norfolk, VA

Client:
WSP (USA)

Role:
Procurement Strategy
Design Reviews
Constructability & Risk Review
Construction Management

Key Characteristics:
- $3.8B Program Cost
- $3.1B Single Design-Build Contract
- 1.5-miles Bored Subaqueous Twin Tunnels
- 46-ft diameter TBM

Professional Services:
From: May 2018
To: Present

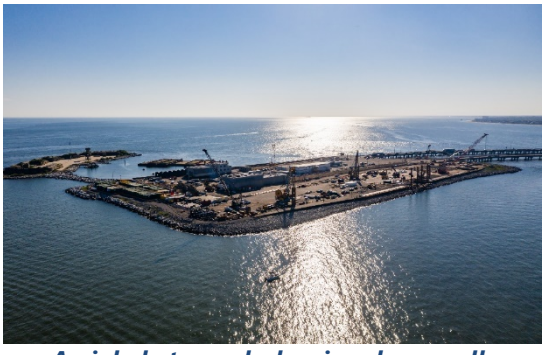
VDOT is implementing the Hampton Roads Bridge -Tunnel Expansion project to increase the capacity of the existing, heavily congested, I-64 Hampton Roads Bridge and Tunnel between Hampton and Norfolk, Virginia. The project will include six (6) new lanes of highway and of eight (8) new lanes of bridge and twin-bore tunnels.

Approximately 4 miles of trestle bridge and bored tunnels are being constructed for the expansion along with 5 miles of highway widening using a design-build project delivery method. A single design-build contract was awarded in April 2019 to design and construct the project.

This project includes twin 46-foot excavated diameter bored tunnels, 8,000 foot in length each, being constructed in very soft alluvial soils and underlying denser/stiffer granular and clay deposits. The tunnels will span between two existing man-made islands and are being excavated using a Variable Density Tunnel Boring Machine (TBM). The new tunnels are adjacent to the existing I-64 immersed tube tunnel. These tunnels are the second largest bored tunnel diameter constructed by TBM in the country. The tunnels are comprised of a bolted, gasketed precast concrete segmental lining system designed to meet very strict leakage criteria and durability requirements to achieve a 100-year design life.

The ground below and between the man-made islands has significant geotechnical challenges and, in certain areas, requires significant ground improvement to support the temporary works and permanent structures.

JCK Underground has provided support during multiple phases of the project including: planning and procurement phase; preliminary design phase, and currently in the construction phase. JCK Underground supported in an advisory role assisting VDOT as it developed a procurement strategy for the large design-build contract. During the preliminary design phase, JCK Underground provided geotechnical, structural, constructability and risk reviews of the preliminary design. Currently, as part of the Engineering and Construction Support Team led by WSP (USA), JCK Underground is providing tunnel construction technical support as well as geotechnical and structural review as the final design is advanced during the construction phase. JCK Underground is also providing island and tunnel construction management key personnel including the Tunnel Resident Engineer and Tunnel Chief Inspector.



Aerial photograph showing slurry wall construction on the South Island.
Image Courtesy of the HRBT Expansion Project