I-64 Hampton Roads Bridge-Tunnel Expansion (HRBT)

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

Client:
WSP (USA)

Role:
Procurement Strategy
Preliminary Design Reviews
Design Reviews
Construction Management

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

Professional Services:
From: May 2018
To: Present

The I-64 Hampton Roads Bridge -Tunnel Expansion project will include six (6) lanes of highway and construction of eight (8) lanes of bridge and tunnel to increase the capacity of the existing I-64 Hampton Roads Bridge and Tunnel connection between Hampton and Norfolk, Virginia.

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.

Aerial photograph showing diaphragm wall construction on the man-made south island.
Image Courtesy of HRBT Expansion Project

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

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

JCK Underground has been providing support during multiple phases of the project, including planning and procurement phase, preliminary design phase, and currently in construction phase as part of the Engineering and Construction Support team lead by WSP (USA). 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 JCK Underground is providing tunnel construction technical support and geotechnical and structural review as the final design is advanced during the construction phase. The design builder is Hampton Roads Connector Partners (HRCP) comprising a joint venture of Dragados USA, Flatiron Constructors, Vinci Construction Grands Projects and Dodin Campenon Bernard. HDR and Mott MacDonald are the lead designers for HRCP.