

# Underwater Construction

## What is Horizontal Directional Drilling?

Horizontal Directional Drilling (HDD) is a method of installing underground pipelines, cables and service conduit through trenchless methods. This method goes above and beyond traditional trenching; connecting utilities and services in places that traditional trenching is impractical.

HDD involves the use of a directional drilling machine, and associated attachments, to accurately drill along a predetermined path to install the required pipe.



- Drill rig used to drill and later pull pipe through the borehole.
- Two sites are normally required, a drilling site and receiving site, which are staged both on land and offshore.

## Typical Drill Rig Site



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## Horizontal Directional Drilling (HDD) Construction Activities



- **Pilot Drill** - the initial boring is completed by pushing and rotating the drill pipe along a predetermined path.



- **Reaming** - the pilot bore's diameter is incrementally enlarged using reaming tools to drill from the exit site back to the entry point.



- **Pipeline Pullback** - once the reaming process is complete and the pipe has been welded together, the pipe is pulled back through the boring site.

*\*Drawings are for illustrative purposes and not project specific.*

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## Horizontal Directional Drilling (HDD) Pipe Assembly and Pulling



- Once drilling activities are complete, the pipe pulling process begins.
- The pipe string is welded and fused together.
- The pipe string is coated.
- The pipe undergoes testing by radiography to determine its integrity.
- The pipe is pulled through the borehole.

- Two separate electric-resistance-welded, grade A steel pipes will be pulled through the borehole.
  - Pipe diameter: 8.625 inches
  - Minimum wall thickness: 0.375 inches
- In the pipe, a 230 kV insulated high-pressure fluid-filled (HPFF) cable system is installed.
  - Two cable sets are required for the circuit load. (One cable set per pipe.)
  - Cable size: 2,500 kcmil (circular mills) copper cable
  - 500 mills of laminated paper polypropylene (LPP) insulation



# Water Crossing



## Horizontal Directional Drilling (HDD) Platform-to-Shore Approach

- The Greys Point Shore Approaches will consist of two HDD shore approaches approximately 2,400 feet long exiting into a water depth of 23 feet
- The Rappahannock Shore Approaches will consist of two HDD shore approaches approximately 2,400 feet long exiting into a water depth of 17 feet



## Platform-to-Platform Crossing

- Similar to the shore approach sections, the middle crossing segment will consist of a dual carrier HDD pipe system with a conduit attached
- The distance between each platform will be approximately 6,850 feet

