CC Underground

Orillia, Ontario - Canada

COMPANY:

CC Underground

CC Underground has over 150 years combined experience in underground construction specializing in trench-less solutions from ¾“ product to over 50“ product.

By combining their team of well trained and experienced staff with their vast fleet of the industry’s most up to date equipment they pride themselves in providing their clients with results that are on schedule, on budget, and beyond quality expectations each time and every time.

PROJECT:

Caledon 2017-092T Water Main Install

The scope of work outlined on this project was to install, by Horizontal Directional Drilling, 800 meters of new 18” PVC water main pipe to connect a new residential subdivision with the existing water pumping station.

Horizontal Directional Drilling was selected as the only option for install as traditional open cut excavation could not be performed due to terrain and depth.

Case Study - Horizontal Directional Drilling

CHALLENGE:

Unknown Soil Conditions and Impassable Terrain

This project faced many difficult challenges, foremost was an entirely uphill drill shot passing under dense forest and residential properties. 30 plus meters below grade at the deepest point and a shallow road crossing on the rig side. Varying to unknown ground conditions at depth required a Drilling Fluid capable of withstanding these unknown conditions while utilizing a mud motor and recycling equipment

SOLUTION:

Drilling Fluid Design and Support

Di-Corp was contacted to assist with the Fluids. Di-Corp created a Fluid program, based on the information given on the Geotechnical reports, supplied by CC Underground.

CC Underground successfully completed the project using the following products, Wyo-Ben Extra High Yield Bentonite, Earth Pro Pro-Pac D, Earth Pro PH UP Soda Ash and Earth Pro Drilling Detergent L to complete the project through these difficult conditions.

RESULTS:

Hole Stabilization

Overall the entire project was completed on time and to Fluid budget. There was a temporary moderate water inflow, likely an underground pond encountered, which temporarily flooded the bore hole. The fluid as designed stood up to this washout and the bore hole remained intact.

The Drill operator noted that the pull forces were at or below 40,000lbs during the initial pull, then fell below 20,000lbs near completion. 20,000 lbs.

CC Underground

Orillia, Ontario - Canada

COMPANY:

CC Underground

CC Underground has over 120 years combined experience in underground construction and utility installation/repair specializing in trench-less applications. They install conduit, cable, water, sewer and power lines in some of the most unforgiving ground conditions without open trench excavation.

PROJECT:

Georgian Highway 400 Crossing Barrie, Ontario - Canada

The scope of work outlined on this project included the installation of 240' of 24" steel liner under six lanes of traffic; as well as, a southbound off ramp on a major highway while still in operation.

In addition, installation of 800' of 16" PVC water main was needed after the steel was in place.

CHALLENGE:

The bore on this project was engineered at a nominal depth of 5.3 meters below road grade and the job sloped in a straight line from rig side to exit side at 5°, thus giving the bore no static fluid control. In addition, the bore was in silt to silty clay seams with very few rocks/ boulders.

The potential challenges were to avoid any road settling or frac out and secondly to control any high pull pressures due to silt. Due to the time it takes to weld the steel pipe during pull back, the hole and fluid must be maintained to prevent settling.

The job was drilled with a 10" pilot bit, pre-reamed the entire length with a 16" reamer, while trailing rods. Then a 36" reamer was used for the highway portion, followed by the 24" steel liner.

Because of the down slope, the returns were not possible and they had to physically return the fluid from one side of the highway to the other with the use of several vacuum trucks. This coupled with the large diameter of hole, meant they had to constantly remix fresh fluid in a short period of time.

SOLUTION:

Fluid design and maintenance

The success to this project was ultimately based on fluid design and maintenance. The fluid needed to be able to suspend the silt cuttings in a fast down slope flow and then recycle them for reuse.

CC Underground were able to use Extra High Yield Bentonite, Pro-Pac, Soda Ash, Citric Acid and Prima-Seal, supplied by Di-Corp, to complete the project through these difficult conditions.

RESULTS:

Hole stabilization

During the project the 16" pre-ream sat open for a few days, while other things where delivered and put in place.

They started the 36" ream and pull on Friday at 5:00 PM and the steel liner was in place at 11:30 AM Saturday. CC Underground chose to work throughout the night to avoid the large hole being left open longer than needed.

It was noted by the rig operator that the pull force never exceeded 40000 lbs at any point during the ream and pull. This indicated that the hole integrity and filter cake worked as intended.

On Monday, the site was investigated and it was found that the hole around the steel liner was able to stay full of fluid. This gave them the overbalance effect needed to avoid settling of the highway.