LMR Drilling UK Ltd.

New Record Set by LMR Drilling...

Tamar River Crossing

LMR Drilling UK Ltd., a World leader in the industry, have completed the pull back of the longest Polyethylene pipe to be installed by the technique of Horizontal Directional Drilling.

Drill Rig Site at Saltash

This project has pushed out the boundaries of technology for the drilling and installation of a pipeline. This was in order to meet the necessities of a project, which could not have been achieved economically and environmentally by any other method.

The Main Contractor, Miller Civil Engineering, have been engaged by South West Water to construct new facilities at the Ernesettle Waste Water Treatment Works in Plymouth.

Drill Rig Site at Saltash

The new pipeline connects the Sewage system from Saltash, Cornwall to Ernesettle, Devon, by passing beneath the River Tamar. The length of the pipeline is 1400 metres and the diameter is 560 mm. The High Performance Polyethylene (HPPE) pipe also specified as PE100, was an SDR 17 having a wall thickness of 34.4 mm. It was manufactured in accordance with Din 8074/8075 and WIS No. 4-32-13 90 mm-1000 mm Pipe: 1993.

There were many difficulties associated with the routing of the pipeline. The location of the treatment works in Ernesettle, the River Tamar, and the position of the Ministry of Defence establishment, required the pipeline to cross beneath the River and a railway line at an angle making the crossing longer than the natural width of the River.

Pipe String

Conventional methods had been considered but dismissed because of problems with water depth and environmental issues across a large area of mud flats on the Ernesettle side of the River. The only construction technique suitable was Horizontal Directional Drilling.

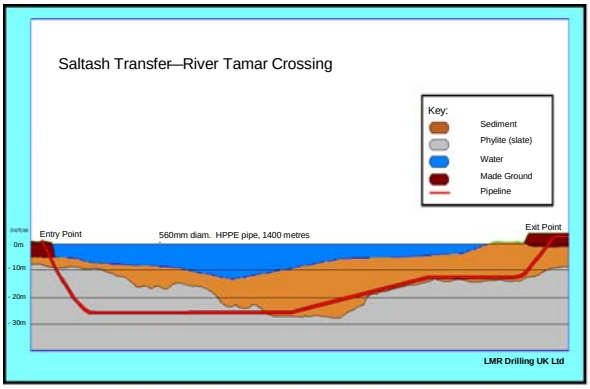
The length of 1400 metres was therefore considered to be a great challenge for engineering a solution.

Because of the restricted pipeline construction site, fabrication of the 1400 metre pipeline, prior to installation into the drilled hole, had to follow a tortuous route across playing fields and double back on itself over a golf course to return to the initial departure point.

Low friction conveyors were used to support the pipe during pull back and prior to the pull commencing. The system was checked using a trial pull to ensure the rollers were correctly aligned.

A pre-hydrostatic test of 8 bar, in accordance with the Water Research Council's procedure CESWI 5,

was conducted on the pipeline before installation into the drilled hole. Preliminary works began on 4th January 2000 with the drilling rig and equipment arriving on Tuesday 11th and drilling commencing as programmed on 12th January 2000.



Drill Profile

The drilled profile passed through varying geology consisting of Phyllite (slate), very Soft Silt, Sand/Gravel and Made Ground. The length drilled through the Phyllite was 388 metres and the final hole was opened up by using mill tooth cutters. Difficulties were foreseen with the interface between the hard and soft ground and great care was taken when drilling passed this point on the drill profile.

A decision was taken at the time of tender submission to commence drilling on the Saltash side of the River, thereby going directly into the hard Phyllite. This decision was viewed by the Client as the best approach for this project.

Soon after commencement of pilot hole drilling, treatment of the ground by cementing through the drill pipe was required. This technique has been well established in the LMR organisation and added value to the success of the project.

The pull back, having an average load of 40 Tonne, began early on Thursday 24th February, a little over seven weeks from arriving on site, and was completed early Saturday morning on the 26th February 2000.

Rig Site at Saltash

This considerable engineering achievement has been well received by Miller Civil Engineering and South West Water.