

The Sahara® Pipeline Inspection System Deep Pipe Location

Pipes at depths of over 20m can be precisely located from the surface, and their position marked.

Utility plans do not always accurately record the location of underground assets, leading to risk when carrying out construction work in the vicinity. Caution may result in otherwise usable land being sterilised from future use due to uncertainty in the asset location. Accurate knowledge of the pipe location can massively increase the value of the land above.



Typical applications include:

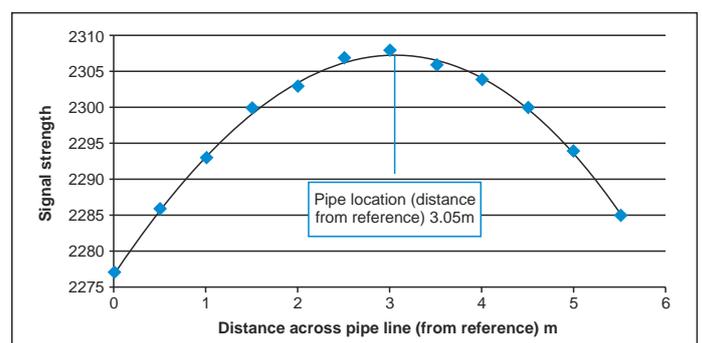
- Locate pipelines before piling operations
- Reduce risk
- Maximise land value
- Update asset records

The photograph shows the survey equipment being used to pin-point the line of a 1.5m diameter storm culvert buried at a depth of 10m. The survey was for a developer who wanted to be sure they knew where the culvert was before purchasing the land for building.

The technique was developed in response to a request from a developer who was unable to find any technique to locate a water main buried 14m deep without excavating. On hearing of the problem, WRc realised that an enhancement of the standard Sahara Pipeline Inspection System would allow the line of the pipe to be found.

A new sensor was designed, new control and monitoring software written and a new survey procedure developed. These were tested to confirm the capabilities of the new technique and demonstrate to the developer and the water company who owned the pipeline that the system would provide the necessary location accuracy. The tests showed that the technique was able to locate a pipe at 15m depth to better than $\pm 200\text{mm}$.

The output of the device is a series of readings taken at points across the line of the pipe (shown as diamonds on the graph below). These are processed to determine the point at which the reading would be strongest as the locating device is moved across the pipe. Once this point is identified, it can be marked on the ground over the pipe to indicate the location of the main below. This process is repeated along the length of the main, tracing out the pipe's location.

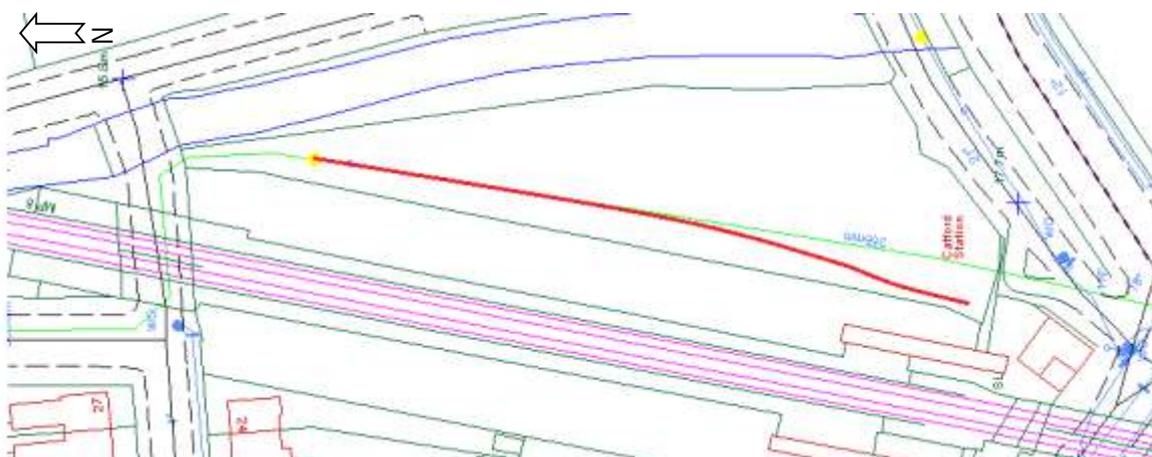


Case Study: 300mm MDPE Raw Water Main

A 300mm raw water main that had been directionally drilled beneath the site of the old dog racing track in Catford, SE London, was preventing development of the land above. Uncertainty over the line of the pipe dictated that an 8m easement had to be left on either side of the recorded line of the pipe to ensure there was no risk of damaging the pipeline. Although visible at the north end of the site, the main was known to be approximately 14m deep at the southern edge.

The developer (Barratt Homes) had been unable to find any technique that was able to provide the pipe location without excavating and so was left with the options of leaving a large area of the site unused or re-routing the main. Re-routing would have required digging down 14m to the pipe at the southern edge of the site.

The deep location tool was used to find and record the actual line of the pipeline. The plan below shows the traced line of the main (in red) superimposed on the original plan of the main (in green). Having pin-pointed the line of the pipe the water company is now able to relax the restrictions - reducing the easement to 3m wide - freeing up a significant extra area for development.



Normal Operating Parameters

Accuracy	Better than $\pm 200\text{mm}$ at 20m deep
Minimum pipe size	250mm
Minimum working pressure	No lower limit
Maximum operating pressure	16 bar (higher pressures may be possible – please ask)
Entry requirement	50mm clear bore
Maximum survey length	2000m

The technique uses the flow of water to carry the sensor through the pipeline. The sensor is mounted on an umbilical cable so results are obtained immediately.