

Maxibor guides HDD in the right direction

Maxibor is utilising the latest magnetic guidance technology to further de-risk its horizontal directional drilling (HDD) projects across Australia. The stronger frequency transmitters on the magnetic guidance systems are now capable of providing readings from depths of up to 100 m, saving valuable time and significantly enhancing the accuracy of the bore alignment.

HDD is an increasingly popular solution for the installation of infrastructure, with most major rail, road, water and sewer, gas, power, telecommunications, data centres, fuel, sea cable, rail and mining projects now involving trenchless installation.

The recent climatic events in Australia – fires, flood, wind, inundation and drought – are resulting in a growing understanding that infrastructure assets are best protected if installed securely underground.

The underground world of infrastructure is also increasingly congested, making the likelihood of services strikes much higher. Services strikes have become even more costly in terms of disruption, cost and the reputation of all stakeholders, making it critical to stay on the designed alignment both at the pilot and reaming stages.

Innovative advances in guidance technology are also allowing bores to become more complex, longer, deeper and wider in diameter. Knowing what and where the bore is taking place becomes even more important as the risks to the pipeline, other services and the environment increases.

Benefits of HDD

Engineering expectations of HDD installations in terms of specifications and tolerances have also increased in recent years, with the aim of reducing the risk of the HDD process. Quality assurance through inspection is also receiving higher priority.

Now, HDD providers can ensure they install to design and provide the evidence to demonstrate it, making the process more likely to be considered in the delivery of future projects.

As the frequency and value of HDD projects increases, it is vital that the risks associated with the projects are minimised. It is also important that the opportunities from using trenchless solutions are optimised for the benefit of all stakeholders including asset owners, design engineers, principal contractors, HDD providers and the community and environment.

Maxibor has now sought to take added measures to ensure that its pipelines are installed to design through the use of innovative trenchless technologies now available in Australia.

HDD guidance technology in Queensland

Maxibor used the latest guidance system technology for the delivery of a project for Logan City Council involving the connection of the Greater Flagstone Development Area with the Cedar Grove sewerage treatment plant. It required the installation of more than 2.8 km of pipeline in seven separate bores, including one single bore of 1.3 km, which reached a depth of 56 m.

Maxibor used the Underground Magnetics Mag 8 locating system to assist the HDD drill operator in locating and tracking underground drill head locations and orientations. The system consists of a transmitter, a receiver and a remote display.

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Rodney O’Meley, Maxibor Owner

The Mag 8 system provides up to 10 channel-license free radio telemetries between the receiver and remote display. The user can easily pair any two receivers and displays so that communications between the pair will not be interfered by other paired receivers.

The transmitter sends digital information of the pitch, roll, temperature, and battery status through an FM modulated RF signal. The receiver receives this information and uses RF signal to identify the transmitter’s status and location to a remote display through a radio telemetry system.

An HDD operator can use the information from the display to guide the drill head to the desired path.

Mag 8 system advantages

One major advantage of the Mag 8 system is its simplicity. Once the receiver and transmitter are

paired, the operator is not required to push any buttons to pinpoint the location, direction or depth of the transmitter.

Another advantage is that the frequency can be changed when the transmitter is downhole, saving significant time through not having to pull out.

The Mag 8 is distributed in Australia by Trenchless Sales; its Mag 8 Pack6 AU solution comes with:

- Mag 8 receiver
- Mag D8 display
- 3 rechargeable lithium batteries
- Mag battery charger and carry case
- 1 Echo 50 transmitter 10 frequency/dual power
- 1 Echo 110 transmitter 10 frequency/dual power
- a 6.5 inch (165 mm) OD endload.

Trenchless Sales’ Dave Warner says the system – which is widely used in America – is gaining rapid market appreciation in Australia. Maxibor Owner Rodney O’Meley also says the Mag 8 system has made a world of difference for how drillers operate on long bores, including for Logan City Council.

“Knowing that we are drilling to alignment at significant depth makes both the client and us much more confident about the project being delivered as designed,” says Mr O’Meley. “It has saved us time and added value. The Mag 8 system is now very much an integral part of the HDD solutions Maxibor provides to its clients on these types of bores.”

Improving accuracy on the inclination and azimuth planes of bores provides wider opportunities for the use of HDD solutions into more complex, geologically challenging and environmentally sensitive sites such as rail corridors, wetlands, expressways and waterways. The Mag 8 system is also fully effective in saltwater environments and its accuracy helps to allay concerns of landowners that unforeseen damage will be done by the HDD activities.

Mitigating risks

The advances in technology mean bore designs with multiple curve sections can be made with confidence that the required precision of the bore alignment will be achieved. Design also considers the pressures

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that will be exerted on the pipe through the pull process and a lifetime of operation. Installation of the engineered design helps to preserve the integrity of the pipe through the pipe pull process by limiting friction, drag and damage to coating. Failure to achieve the right alignment can have material cost, environmental and other consequences including:

- striking services
- frac outs
- wrong exit point
- re-work of bore
- increased stresses on the pipe
- impact on future installations in vicinity
- contractual disputes.

The main costs associated with underground installations are labour and plant time and drill fluid product and disposal. The more that can be done to reduce these times and costs, the lower the cost to the HDD provider and the more competitive the price can be to clients.

HDD providers who are confident they will be able to drill to alignment, or adequately explain and support otherwise, will provide much better value to their clients. Service strikes, frac outs, wrong exits and, worst of all, bore failure are all events that the client and HDD provider can de-risk through fit for purpose guidance systems.

In some circumstances the designed alignment will not always be the as-built alignment; however, it is important the as-built alignment is then reassessed from an engineering perspective to ensure there will be no unintended consequences. Unless accurate location data can be captured, shared and analysed, the integrity of the installed pipeline may be at risk.

Knowing where the installed pipeline is also provides confidence when installing future infrastructure in the vicinity.

Contractual disputes can arise around the as-built alignment of pipelines installed using HDD. Having accurate information on the as-built in a timely manner will allow the best on-site decisions to be made should changes in the bore alignment occur; helping maintain good relationships between stakeholders.

Confidence is key

As an industry, the trenchless technology sector needs to instil confidence into asset owners and principal contractors that infrastructure installations using trenchless solutions will optimise outcomes and have in place actions to mitigate risks. The availability of the right guidance system plays an important part in building the confidence of all stakeholders in ensuring each HDD project will be delivered to everyone’s satisfaction.

Maxibor National Business Development Manager David Turner is more than happy to share knowledge of the Mag 8 and other guidance technologies Maxibor is using to help optimise outcomes on its HDD projects. ●

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Maxibor is using its network of experience to deliver better project outcomes to asset owners and principal contractors alike