TrueGyde Systems
INTRODUCTION

TrueGyde Systems bore planning and navigation was developed more than 10 years ago in Canada in order to provide enhanced support for the latest generation of DC steering tools. The TrueGyde system has since become the global leader in HDD navigation systems. Marcel Berard has been developing software and drilling support systems for over 25 years.

STANDARD RESOLUTION VS HIGH RESOLUTION STEERING TOOLS

Once upon a time, there was a standard resolution Tensor tool. This tool was state of the art at the time. It provided coil tracking but required a large amount of current to generate a sufficient magnetic field for the tool to detect. Typically, the wire was 6 gauge or thicker and the coils were fairly short. A large welder was used to provide 100 Amps or more in each direction to power the coil.

The DC steering tool universe evolved significantly in 2012 when MicroTesla developed the first high-resolution tool. A high-resolution tool has a resolution 100 times finer than a standard resolution tool. It measures the magnetic field of a coil far more accurately and can provide comparable positional accuracy with far less current in the coil. A current of 20 Amps in each direction is often sufficient for positional accuracy that is better than 1% of depth.

The need for far less current in the coil introduces many advantages including a longer coil, a smaller gauge wire and a portable power supply. (figure 2A and 2B)

All of the manufacturers of high-resolution DC steering tools are supported by the TrueGyde Systems software.
AUTOMATED CURRENT SWITCHING BOXES

Today applying current to generate a magnetic field to a remote coil is easily accomplished via a computer controlled interface that communicates wirelessly with radio modems.

BORE PLANNING AND AS-BUILTS

Typically a bore has constraints such as a right of way and a minimum radius. For this reason it is important to assess the feasibility of the bore in advance. TrueGyde Profiler has extensive support for developing and assessing a single bore plan or multiple alternate plans for a given bore. TrueGyde Profiler has simple tools for simple bores and more complex tools for more complex bores.
TrueGyde Profiler can also display the as drilled data in real time while drilling. A sample completed bore is shown above. This display includes the profile and plan views of the bore.

TrueGyde Steer can model the expected magnetic field of hypothetical coils prior to commencing a job. The operator will then know the effectiveness of his coil design.

This was a challenging bore that required many of the TrueGyde software features. This bore had a horizontal S curve with a tight radius. There was no opportunity to put a traditional coil on the surface or the bottom of the bay. Therefore a floating microcoil was used as a movable magnetic source. (figure 5 & 7)
TRUEGYDE SYSTEM ADVANTAGES

TrueGyde, when used in conjunction with a high resolution tool provides the highest degree of accuracy in the industry. Superior tracking capabilities especially where noise and other interference is present. Compatible with all the leading tools in the industry. Supports integrated annular pressure subs. Field search algorithms support multiple methods of magnetic tracking, such as

- The parallel coil
- The center line coil
- The TrueGyde microcoil (provides superior 3D tracking)
- The TrueGyde beacon

Capable of analyzing multiple options for even the most challenging bores. Supports passive ranging for intersects. (This is available at an additional charge) Calculates drillstring interference providing the operator with a vastly improved azimuth. Absolutely no footage fees.

DC tools when combined with highly regulated DC power supplies virtually eliminate interference from high voltage power lines. (figure 6)

Dramatically reduces the interference from overhead power lines.

figure 6
PROVEN PERFORMANCE

The TrueGyde system has proven itself time and again in the field. The following are a couple of examples of an extremely challenging jobs where the system proved its capabilities.

Coast Guard Island, Oakland California.

Job challenges were as follows: (figure 7)

- No way to measure an effective azimuth for the starting coil due to high magnetic interference from numerous sources.
- The bore was initially steered as a point to point tracing measurement.
- There was no way for the downhole sensor to provide a useable magnetic azimuth for the first 330 ft. (100 meters)
- The pilot bore required navigating through the pilings that were supporting the pier.
- The only design option that would get us to the right exit location was to drill a 550 foot (168 meter) “S” curve with a 38 degree total horizontal turn under the bay.
- The exit tolerances were to be within +/- 2 feet (.6 meter) of target, while respecting the private property of the adjacent Marina.
- The crossing was made more challenging due to high levels of pulsating magnetic fields that were measured in the first half of the bore. The source was unknown, but since this is a military facility we will likely never know the source.

All this was accomplished by moving the micro coil only 6 times as seen on the diagram.
Little Tokyo Los Angeles City Center

The project involved drilling under a car parkade and a mall with 12 straight bores and 2 curved bores. This was to inject a ground stabilizing grout into the bores to support the buildings above. The two curved bores were drilled along the future paths of the metro tunnels, shown in yellow below. Since no wire was allowed to be laid on the ground, we used the microcoil extensively on this project. At the exit side some small diameter vertical shafts were drilled to intersect the bores. All bores were intersected with pinpoint accuracy.
TECHNICAL SUPPORT

When you need a little help, TrueGyde support has got your back.

TrueGydes Canadian support team can provide training and online customer support with the help desk link providing real time field support.

It’s not smoke and mirrors folks, if you fall down we WILL be there to help you get back up.

Field wizard Phil Berard has been in the sub-surface navigation industry since 1977. Combined, Marcel and Phil have 65 years experience specializing in sub-surface navigation.

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