

Saving Suceava ... or “Slip Sliding Away”

The city of Suceava, located about 350 km (220 miles) almost due north of the Romanian capital Bucharest, near the Ukrainian border, finds itself in a very unique situation. The city is located on a steep slope above a valley and, due to water-bearing clay layers below the slope, the city is sliding into the valley below. Short of evacuation, the only solution is to stabilize the slope through de-watering. Vertical wells have not proven effective, so a decision was made to use directional drilling to install more horizontally oriented drain pipes. All of the de-watering wells had to be installed from the top of the hill down towards the valley floor, intersecting the clay layers, for maximum de-watering effect.

FlowTex Romania is responsible for this ongoing project and has to-date relied on crews and wireline steering equipment from FlowTex GUT in Germany for the work. As it is both very expensive and time-consuming to bring in foreign crews and equipment for each installation, FlowTex Romania decided to explore using the DigiTrak Cable Transmitter system for two of the next scheduled de-watering wells. Michael Cracium, the project manager for FlowTex Romania, made arrangements for Steve Edwards, one of DCI's European field service managers, to assist with the DigiTrak system.

Upon Steve's arrival on Sunday, November 8, 1998, it was apparent that this project posed significant challenges. The length of



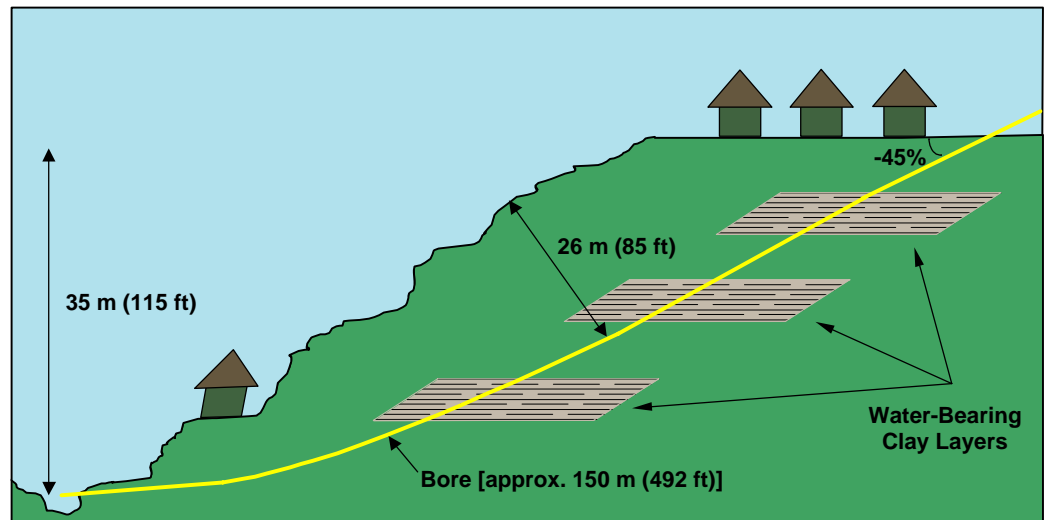
With its foundation sliding downhill, this house is now leaning about 8 to 9 degrees from the vertical.

the bore was planned at about 150 m (492 ft) with an entry angle of -45% . For a significant portion of the pilot bore, the depth would exceed 20 m (66 ft), with a maximum depth of about 26 m (85 ft). To further complicate matters, the drill path would pass under houses, which meant no walkover access, so the DigiTrak off-track guidance feature would be crucial in negotiating these areas.

A detailed drill plan was generated, and the machine setup was begun. Modifications to the Vermeer 24x40 drill housing were required to accommodate the cable for the transmitter. Additionally, a side-entry sub had to be manufactured.

By Tuesday morning the crew had finished all the preparations and begun the pilot bore. Since this was FlowTex Romania's first exposure to the DigiTrak Locating Sys-

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Sketch of drilling profile showing a few houses at the top and one situated on the slope.



Drill exits at bottom of hill dead center in exit pit cut in retaining wall.

(continued from page 1)

tem, this challenging project was less than optimal as a training ground. The going was slow at the outset as the crew received detailed hands-on training. The next day the drill stem had to be pulled out due to a blocked jet. Once the jet was cleared, boring recommenced. Due to the depth and terrain, the process was slow. At the end of Thursday, 80 m (305 ft) had been drilled, and all system components were functioning as intended. By 6 p.m. Friday, the drill head entered the pit on line and grade.

The pullback included a casing pipe with a 3-inch (76-mm) drainage pipe inside. After installing the casing pipe, it would be removed, leaving the drainage pipe in the hole. On Saturday, November 14, it started snowing heavily halting all operations, and by Sunday morning 30 cm (a foot) of snow covered the ground. The cold weather and snow made the already difficult job that much more arduous.

On Sunday, the casing pipe was pulled in and subsequently removed, leaving the 3-inch (76-mm) drain pipe. The flow rate out of the drain pipe was determined to be about 20,000 liters/

day (5260 gal/day). This volume further emphasized the need for additional drainage wells.

The second pilot hole was scheduled to be started on Monday, but the snow caused a 1-day delay. Although the snow caused difficulties, the cold temperatures posed a greater problem because they made it very difficult to splice the cables. Nonetheless, by the end of Wednesday, the crew had drilled half the run and was making steady (but slow) progress. Two days later, the second pilot hole was complete and the second casing and filter pipe were successfully installed.

FlowTex found that the DigiTrak system worked well for this application. In fact, they will be using their scheduled winter break in their activities in Suceava to further familiarize themselves with the DigiTrak system on some "easier" non-cable projects. One of the key reasons for FlowTex's interest is exactly this versatility of the system. By using the Cable Transmitter and its capabilities on complicated long bores, substantial cost and time savings can be realized over more com-



Wiring Cable Transmitter from top of drill string to drill housing in lower section.



Terrain, snow, and populated area caused many distractions.

plex and expensive steering tools. By simply replacing the Cable Transmitter with the standard battery-powered Transmitter, the DigiTrak system can be used on more routine projects by the same crew, utilizing the same locating techniques without any additional training. In essence, the DigiTrak incorporates two systems in one, allowing the contractor to handle a large variety of projects.

by Steve Edwards & Sigi Finsson



Digi Know . . .

- A new version of the DataLog software will be available very soon. The main improvements lie in the user interface and file management functions. The latest DataLog software will still allow you to tabulate and graph all of your major drilling parameters.



TECHNICAL TIPS - 5.0 Series Software

New Software Gives DigiTrak Mark III Receivers Predicted Depth Capability

Let the DigiTrak Receiver do the math for you! The new 5.0 series software provides you with the Transmitter's predicted depth at the front negative locate point (FNLP). It also provides:

1. The Receiver's NiCad battery status in both voltage and percent remaining life.
2. A "running time meter" that records and displays the Receiver's total usage time.
3. The ability to turn off the Receiver without removing the NiCad battery.
4. Confirmation beeps for the Mark III self-test.

For most folks, it is a daily occurrence to cross utilities and clear them by a specific distance. Wouldn't it be nice to know the depth where the tool will cross the utility? The new 5.0 series software in the Mark III DigiTrak allows you to do exactly that.

As stated above, and as shown in the sketch, the 5.0 series software provides a prediction of the depth that the Transmitter will be at when it passes under the FNLP. To observe this predicted depth, the operator stands at the FNLP and holds the trigger in. The predicted depth is displayed in the bottom window as a rapidly flashing number accompanied by a solidly illuminated "squiggle." To observe the "slant distance," simply release the trigger and the bottom window will automatically display the slant distance. (To observe the depth, stand above the Transmitter and do not hold in the trigger.)

The following are necessary for a valid predicted depth:

- The operator must stand at the FNLP with the trigger held in.
- The predicted depth is NEVER taken at the rear negative locate point (RNLP).
- Pitch updates must occur in order for the predicted depth to be accurate. If there is no valid pitch, the predicted depth number will not display, only the squiggle will display.

To verify if your Receiver has 5.0 series software, observe the top left window during the start-up sequence. For instance, if your DigiTrak Receiver has 5.07 software, it will display as 507 in the Receiver's top left window, without the decimal point. Knowing the software version is helpful when troubleshooting over the phone with DCI's Customer Service.

Other 5.0 Software Functions

Accessing the Receiver's NiCad battery status in voltage. Observe the bottom window during the start-up sequence. The voltage will be displayed in tenths of a volt, i.e., 155 is 15.5 VDC.

Accessing the Receiver's NiCad battery status in percent remaining life. Observe the top right window upon releasing a held-in trigger during normal

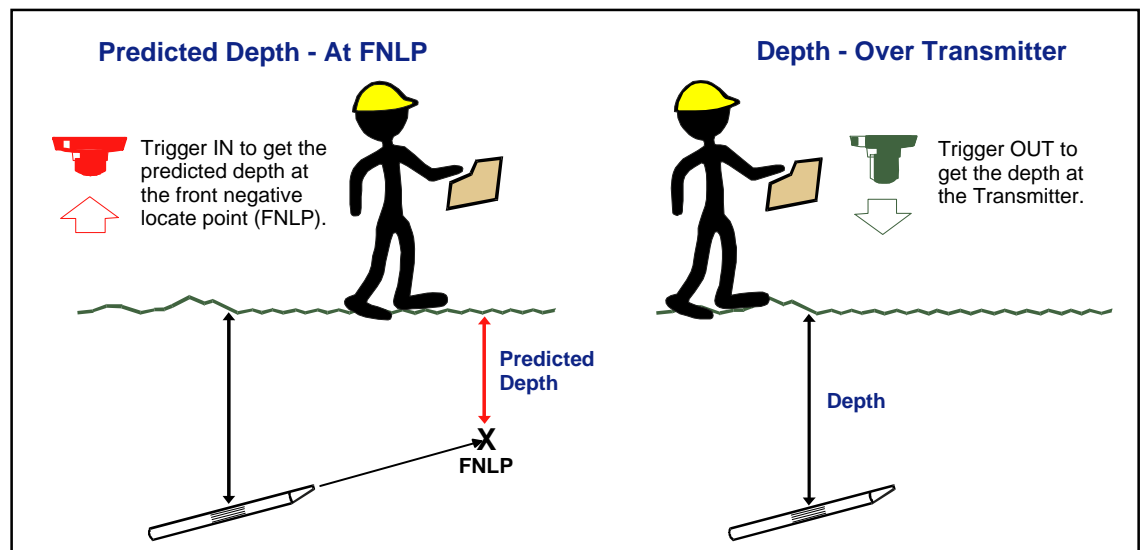
operation. The Receiver's battery status will display as 99, 75, 50, 25, 10, 5, or 0 for 2 seconds. The Transmitter's battery status will display in the top left window at the same time.

Turning off the Receiver without removing the NiCad battery. Click the trigger as if you were taking an ultrasonic measurement. As soon as you hear the beep start, click the trigger 4 more times (observe 1-4 count-up in the bottom window). The Receiver's windows will blank out, indicating the Receiver is turned off.

Confirmation beeps following a Mark III self-test. To conduct the self-test, place the battery into a Mark III Receiver and click the trigger once. As soon as you hear the beep, quickly click the trigger 3 times (observe 1-3 count-up in the bottom window). After completing the self-test procedure, 2 long tones will emit and the error code will display in the top left window. If no error is detected, 3 beeps will sound and the unit will automatically turn off.

For more information about the 5.0 series software, visit DCI's website at www.digital-control.com or call us at 800-288-3610.

by Eileen Breum



Customer Service Keeps Growing

Joe Zeck recently joined DCI to enhance our growing Customer Service crew. Joe comes to us from UTILX Corporation (FlowMole), where he spent 14 years managing HDD crews domestically and training HDD crews around the globe. Joe's experience will benefit DCI as he teams up with the other Customer Service members to provide training to dealers and end-users of the DigiTrak Locating System. Joe can be reached at DCI in Renton or on his mobile at 206-369-4613.



Julian Perez also recently joined Customer Service, transferring from DCI's production crew. Along with his product knowledge, particularly in Transmitters, Julian speaks Spanish. This combination makes him a valuable addition to the Customer Service crew. Julian can be reached at DCI headquarters in Renton or on his mobile at 206-972-1815.

Bruce Arbo is one of the latest additions to the Customer Service Department. He transferred from our RMA Repair Department in June of this year and brings with him an extensive background in electronics and DCI equipment troubleshooting knowledge.

Bruce handles troubleshooting, warranty, and repair issues for DCI worldwide. He can be reached at our headquarters in Renton or on his mobile at 206-369-4574.



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