LOCATING A STORM WATER SEWER

LMX200 GPR was used to locate a storm sewer pipe to ensure successful HDD installation of fiber lines.

Overview

Horizontal directional drilling (HDD) is one of the most common ways to install new utilities into an existing neighborhood. This technique reduces surface disruption, increases installation speed and reduces the environmental impact. For drillers to utilize their guidance systems, they must first know the depth and location of all utilities in their proposed path. New fiber lines were being installed throughout a major part of a metropolitan center. HDD was selected as the primary installation method for the development project. All necessary permits were obtained and utilities located before the drilling crew got to work.

Challenges

The drilling installation began and everything was moving according to schedule when a major rain storm delayed the project for a few days. Upon returning to the site, the crew noticed a small sinkhole where their drilling had crossed a roadway. Upon further investigation, it turned out that the crew had drilled through a storm sewer line that they had no idea was there.

There had been no record of this pipe and its non-metallic composition made it a “non-locatable” according to the standard utility locate process.

Solution

A local service company with ground penetrating radar (GPR) experience was hired to reduce the risk of such a problem happening again. GPR can locate utilities which are traditionally considered non-locatable, including non-metallic pipes like storm sewers. It can effectively determine both the horizontal position and the depth of the utility in question. Both of these pieces of information were fundamental to allow drillers to avoid another strike.

Later in the project, the HDD crew had to cross the same road one block down. The GPR contractor was called in. Using the LMX200 GPR System (pictured above), he used a simple line scan pattern to locate the storm water pipe. After an initial reconaissance of the area with the GPR, the pipe was discovered. To confirm the location of the utility, three lines were run perpendicular to the utility. Once the general position of the pipe was clear the GPR locator then did a scan on top of the pipe to verify its location and depth.

Results

The three line scans collected perpendicular to the pipe clearly show the sewer pipe as a hyperbola (Figure 1), the typical response obtained from crossing a pipe at, or near, a perpendicular angle. The hyperbola on each line was slightly deeper than the last indicating that the pipe was sloping in the ground. The depth ranged from 1.2m to 1.7 meters. The parallel line (Figure 2) run on top of the pipe showed a sloping layer in the data, confirming the findings. The Google Earth™ image in Figure 3 shows where the GPR lines were collected, as well as the existing storm sewer and proposed HDD path. Using the information provided by the GPR locator, the HDD crew was easily able to avoid the storm water sewer and move on with the project as scheduled.

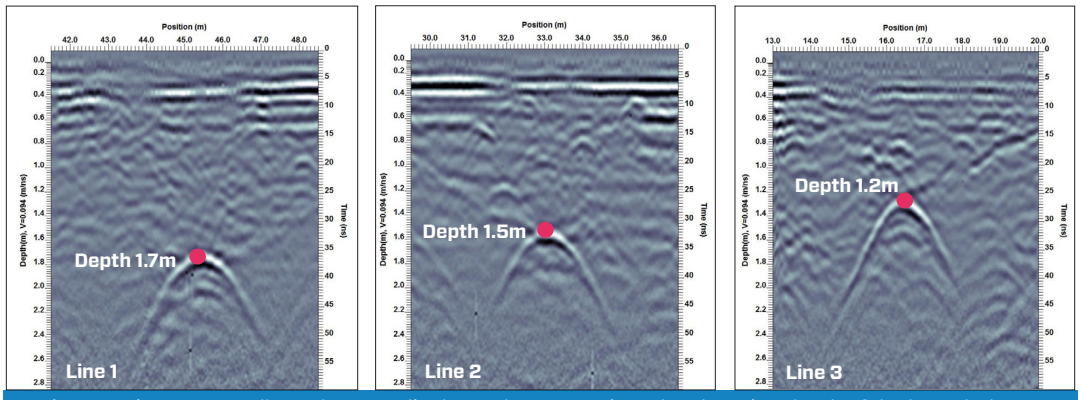

Figure 1: Line Scans collected perpendicular to the sewer pipe. The changing depth of the hyperbola indicates that the pipe is sloping in the ground.

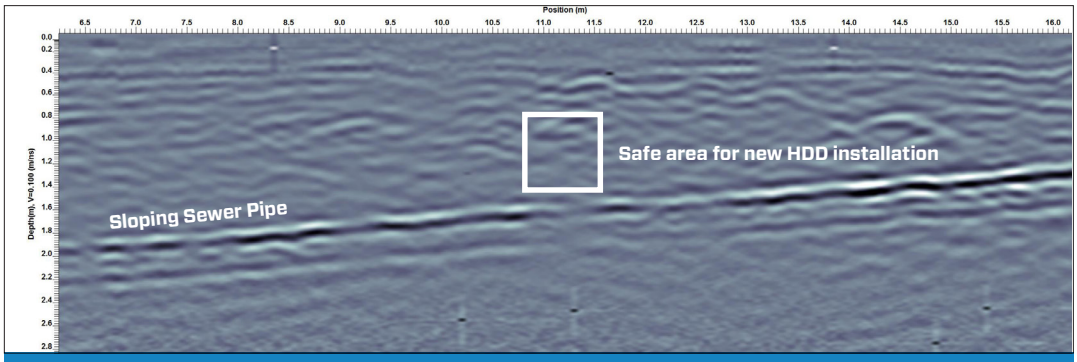

Figure 2: The GPR line collected on top of the pipe shows a sloping reflector, confirming the location and depth of the pipe.

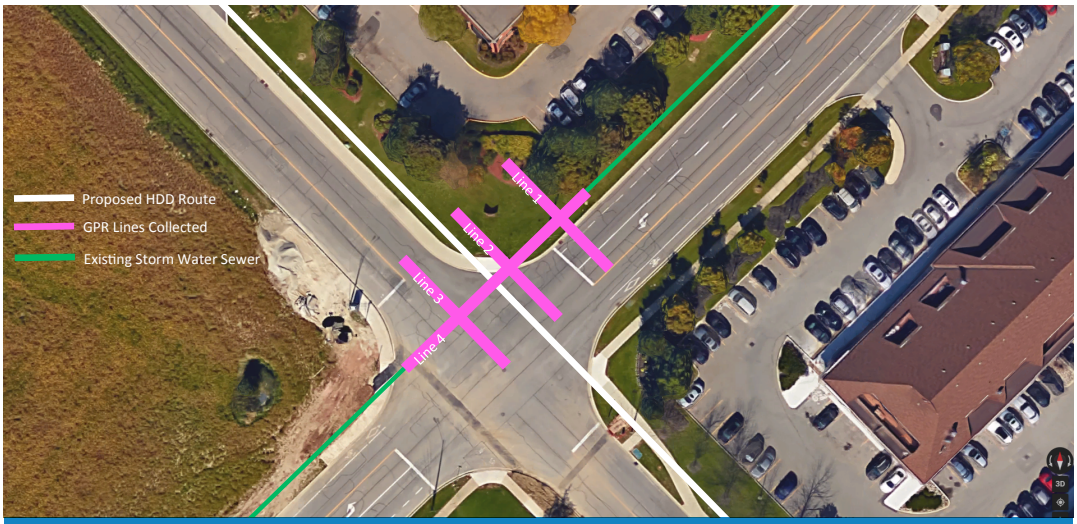

Figure 3: Google Earth™ image showing GPR collection lines, proposed HDD route and existing storm water sewer.

Sensors & Software Inc.

1040 Stacey Court
Mississauga, ON
Canada L4W 2X8

+1 905 624 8909
+1 800 267 6013

sales@sensoft.ca
www.sensoft.ca

subsurface imaging solutions