DELTA Geophysics Inc.

GEOPHYSICAL INVESTIGATION REPORT

SITE LOCATION:

200 Hamilton Avenue
White Plains, New York

PREPARED FOR:

AKRF, Inc.
34 South Broadway, Suite 401
White Plains, New York 10601

PREPARED BY:

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August 8, 2017

1.0 INTRODUCTION

On August 8, 2017 Delta Geophysics personnel performed a limited geophysical investigation at the 200 Hamilton Avenue property in White Plains, New York. The survey site is an active commercial property Subsurface conditions were unknown at the time of survey; surface conditions consisted of concrete, bituminous pavement and vegetation over soils.

2.0 SCOPE OF WORK

The objective was to investigate the subsurface for anomalies consistent with underground utilities and/or any other anomalous features in the client specified proposed boring locations. All findings would be marked and conveyed to on-site personnel.

3.0 METHODOLOGY

Selection of survey equipment is dependent site conditions and project objectives. For this project the technician utilized the following equipment to survey the area of concern:

- Geophysical Survey Systems Inc. SIR-3000 cart-mounted Ground Penetrating Radar (GPR) unit with a 400 Mhz antenna.
- Radiodetection RD7000 precision utility locator.
- Fisher M-Scope TW-6 pipe and cable locator.

Ground penetrating radar (commonly called GPR) is a geophysical method that has been developed over the past thirty years for shallow, high-resolution, subsurface investigations of the earth. GPR uses high frequency pulsed electromagnetic waves (generally 10 MHz to 1,000 MHz) to acquire subsurface information. Energy is propagated downward into the ground and is reflected back to the surface from boundaries at which there are electrical property contrasts. GPR is a method that is commonly used for environmental, engineering, archeological, and other shallow investigations.

The GSSI SIR-3000 GPR can accept a wide variety of antennas which provide various depths of penetration and levels of resolution. The 400 MHz antenna can achieve depths of penetration up to about 20 feet, but this depth may be greatly reduced due to site-specific conditions. Signal penetration decreases with increased soil conductivity. Conductive materials attenuate or absorb the GPR signal. As depth increases the return signal becomes weaker. Penetration is the greatest in unsaturated sands and fine gravels. Clayey, highly saline or saturated soils, areas covered by steel reinforced concrete, foundry slag, of other highly conductive materials significantly reduces GPR depth of penetration.

The 400MHz antenna was configured to transmit to a depth of approximately 10 feet below the subsurface, but actual signal penetration was limited to approximately 1-3 feet below ground surface (bgs). The limiting factor was signal attenuation from near surface soils.
The RD7000 precision utility locator uses radio emission to trace the location of metal bearing utilities. This radio emission can be active or passive. Active tracing requires the attachment of a radio transmitter to the utility, passive tracing uses radio emissions that are present on the utility. Underground electrical utilities typically emit radio signals that this device can detect.

The TW-6 is designed to find pipes, cables and other metallic objects such as underground storage tanks. One surveyor can carry both the transmitter and receiver together, making it ideally suited for exploration type searches of ferrous metal masses. Metal detectors of this type operate by generating a magnetic field at the transmitter which causes metallic objects in the subsurface to generate a secondary magnetic field. The induced secondary field is detected by the receiver, which generates an audible tone equal to the strength of the secondary field.

4.0 SURVEY FINDINGS

All accessible areas within the client's areas of concern were examined during this survey. Each location was examined with the RD7000 for potential subsurface utilities, and then surveyed with the GPR and TW-6 for other potential anomalies.

Within the parking lot, multiple boring locations were examined and all nearby utilities marked on ground surface.

Within the sidewalk along Hamilton Avenue, two proposed boring locations were examined. One location contained several potential subsurface utilities.

Two boring location along Barker Avenue were examined. Both location were adjacent to potential subsurface utilities.

One potential location was situated on the ground floor within the building. This location could not be cleared due to the construction of the floor.

All potential utility conflicts were discussed with the client representative on-site, and alternate locations were examined where needed.

5.0 SURVEY LIMITATIONS

GPR depth of penetration was limited to approximately 2-3 feet bgs. The limiting factor was due to conductive soils. The TW-6 was not able to be utilized in some areas due to the presence of reinforced concrete. Floor construction within the building prevented signal penetration at the interior location.

6.0 WARRANTIES AND DISCLAIMER

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity to any anomalies indicated in this report. In addition, the absence of detected signatures does not preclude the possibility that targets may exist. To the extent the client desires more definitive conclusions than are warranted by the currently available facts; it is specifically Delta's intent that the conclusions stated herein will be intended as guidance.

This report is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based on the facts currently available within the limit or scope of work, budget and schedule. Delta represents that the services were performed in a manner consistent with currently accepted professional practices employed by geophysical/geological consultants under similar

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