GEOPHYSICAL ENGINEERING SURVEY REPORT

Commercial/ Residential Property
526 4th Avenue, Brooklyn, NY 11215

NOVA PROJECT NUMBER:
24-4296

DATED:
August 23, 2024

PREPARED FOR:

HALEY ALDRICH

237 West 35th Street, 16th Floor
New York, NY 10123
www.haleyaldrich.com

PREPARED BY:

NOVA
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NOVA GEOPHYSICAL SERVICES

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August 23, 2024

Cheryl Benmergui
Senior Project Manager
H & A of New York Engineering and Geology, LLP
213 West 35th Street,
New York, New York 10001
P: 646.277.5690 E: cbenmergui@haleyaldrich.com

Re: Geophysical Engineering Survey (GES) Report
526 4th Avenue,
Brooklyn, New York 11215

Dear Ms. Benmergui.

Nova Geophysical Services (NOVA) is pleased to provide the findings of the geophysical engineering survey (GES) at the above referenced project site: 526 4th Avenue, Brooklyn, New York (the "Site").

INTRODUCTION TO GEOPHYSICAL ENGINEERING SURVEY (GES)

NOVA performed a geophysical engineering survey (GES) consisting of a Ground Penetrating Radar (GPR) and Electromagnetic (EM) survey at the site. The purpose of this survey is clear and mark proposed boring locations as well as to locate and identify utilities, underground storage tanks (USTs) and other substructures that maybe located at the vicinity of the proposed boring areas of the project site on August 21st, 2024.

The equipment selected for this investigation was a Sensors and Software Noggin 250 MHz ground penetrating radar (GPR) with a shielded antenna and a RadioDetection RD7100 Electromagnetic utility locator. A GPR system consists of a radar control unit, control cable, and transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 250 MHz. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger

pulse into bipolar pulses that are radiated to the surface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast (void, steel, soil type, etc.). Signal reflections travel back to the control unit and are represented as color graphic images for interpolation.

A typical electromagnetic (EM) utility locating system consists of a transmitter unit and a receiver unit. The receiver unit can be used independently of the transmitter unit in order to detect utility lines with an inherent EM signature (electric utility lines, water lines, etc.). If needed a current at a specific frequency can also be placed on a utility that is being located. This can be done via the transmitter unit by either direct connection or induction via an EM field varying at specific frequency. The receiver unit is then set to the selected frequency and the electromagnetic field created by the current running through the utility can be located allowing the utility to be marked.

GEOPHYSICAL METHODS

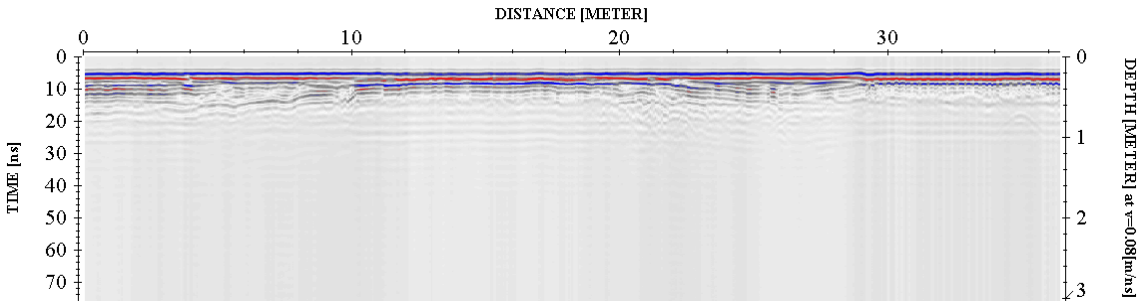
The project site was screened using GPR to search the specified area and inspected for reflections, which could be indicative of substructures and utilities within the subsurface. An EM utility locator was used to help determine the locations of utilities within the survey area.

EM data was collected and interpreted on site and suspected utilities marked as needed. GPR data profiles were collected for the areas of the Site specified by the client and processed as specified below.

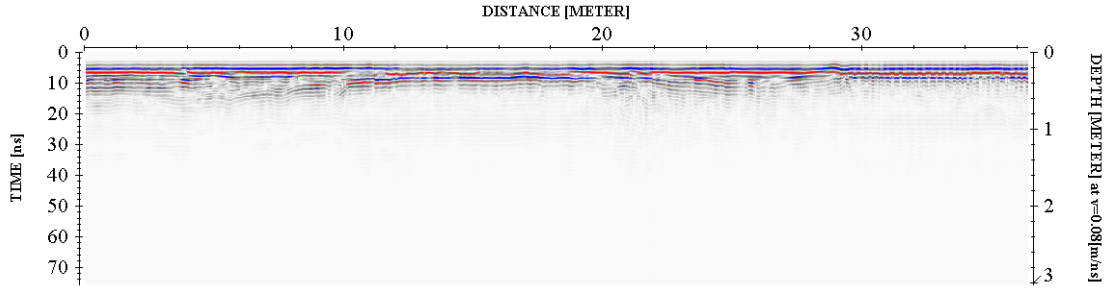
DATA PROCESSING

To improve the quality of the results and to better identify anomalies NOVA processed the collected data. The processing workflow is briefly described in this section.

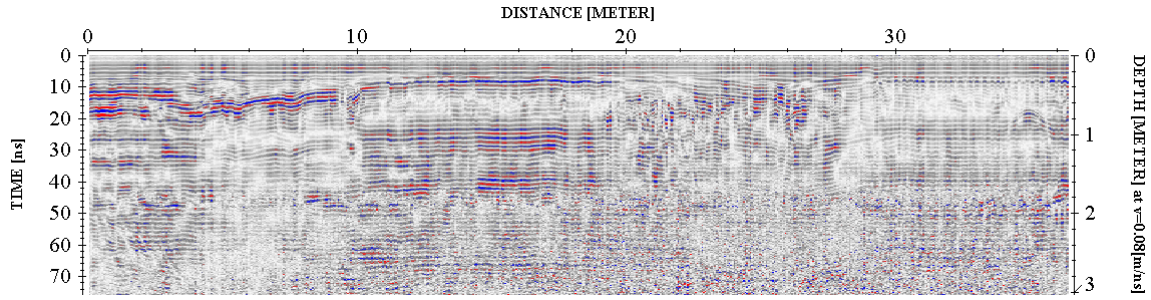
Step 1. Import Raw RAMAC data to standard processing format



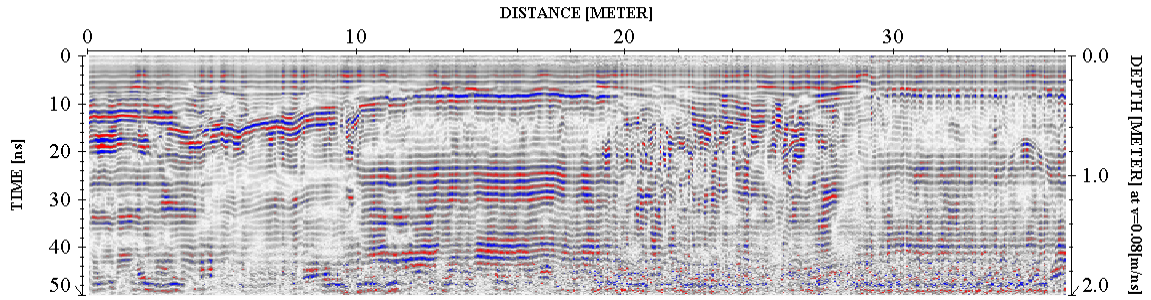
Step 2. Remove instrument noise *(dewow)*



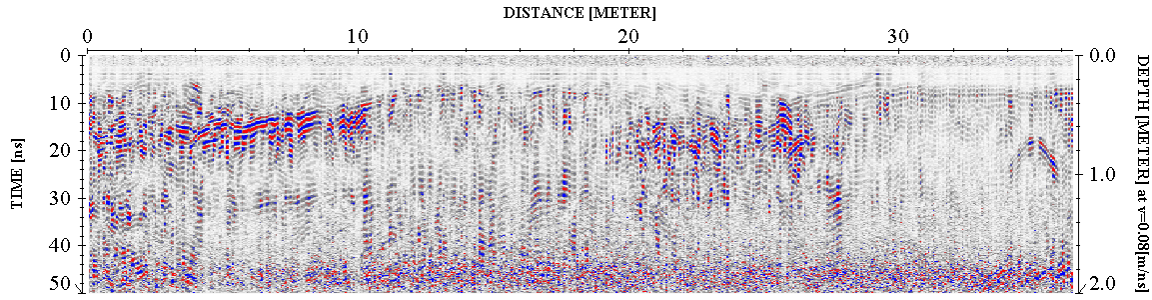
Step 3. Correct for attenuation losses *(energy decay function)*



Step 4. Remove static from bottom of profile *(time cut)*



Step 5. Mute horizontal ringing/noise *(subtracting average)*



The above example shows the significance of data processing. The last image (step 5) has higher resolution than the starting image (raw data – step 1) and represents the subsurface anomalies much more accurately.

PHYSICAL SETTINGS

NOVA observed the following physical conditions at the time of the survey.

Weather: Sunny

Temperature: 60° F

Surface: Concrete/ Pavement

Survey Parameters: A GPR grid scan was conducted within the survey areas as shown on the survey plan. The approximate line spacing of the grid survey was approximately 5'. Additional GPR data was collected over features of interest.

Limitations: The geophysical noise level (GNL) at the site was high due to being in an urban environment.

RESULTS

The results of the geophysical engineering survey (GES) identified the following at the project site:

- Anomalies resembling potential subsurface utilities (such as electric, water, sewer, gas, and communication) were identified. The approximate locations are shown in the survey plan.

- The GES confirmed that all main utilities entered the subject property from 4th Avenue except the communication lines, which entered from 14th street.

- The GES identified that all utilities in the basements of the buildings were all overhead, with no subsurface utility was identified.

- NOVA cleared and marked all proposed boring locations as well as adding additional locations and adjusting boring locations as needed.

- The GES identified two separate floor drains in two different buildings, one in #520, and the other in #524. The GES confirmed that both of these drains were connected to the main sewer system of the project site buildings.

- NOVA cleared and marked all proposed boring locations.

If you have any questions, please do not hesitate to contact the undersigned.

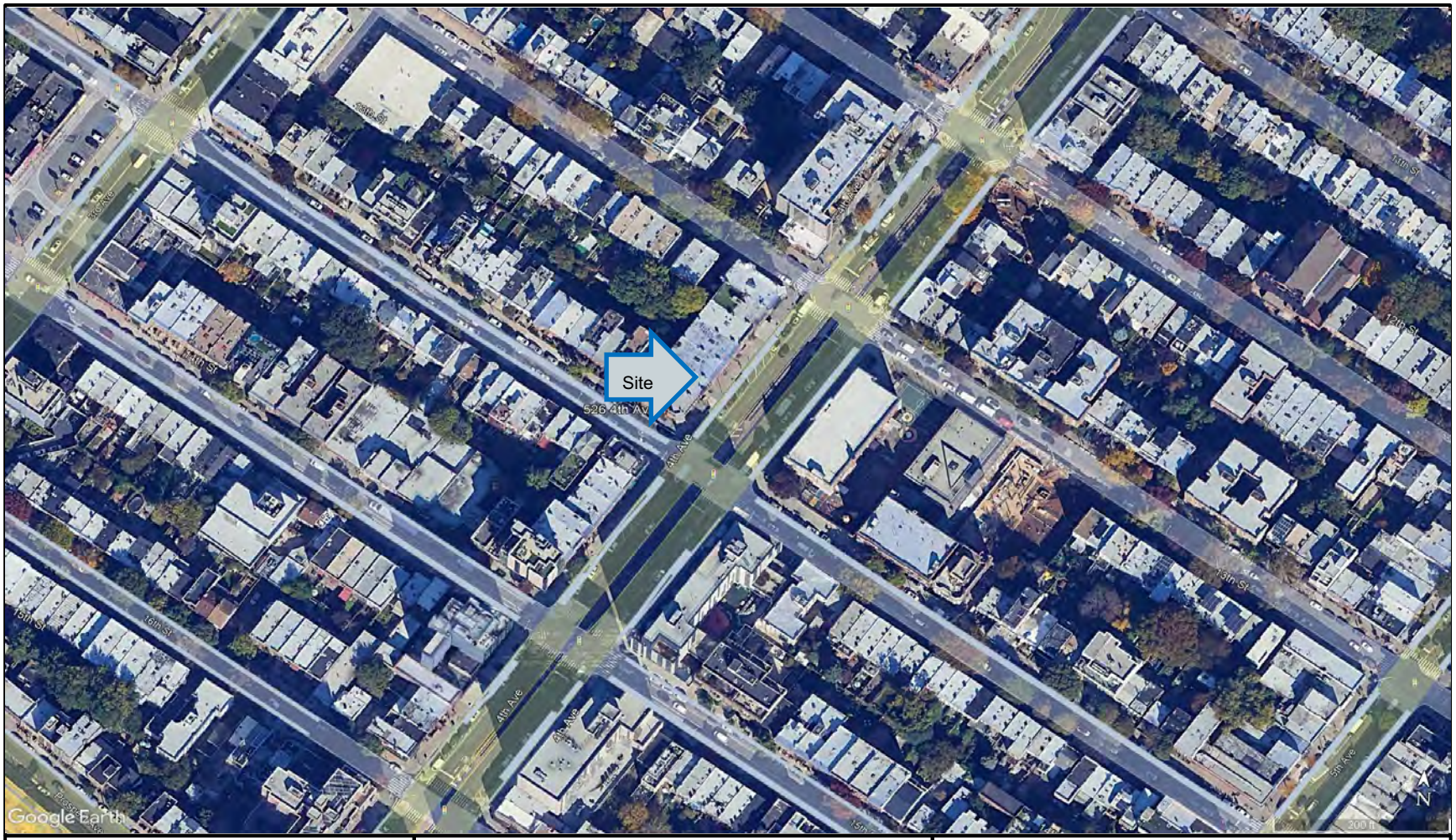
Sincerely,

NOVA Geophysical Services

Levent Eskicakit, P.G., E.P.
Project Manager

Attachments:

Location Map
Survey Plan
Geophysical Images



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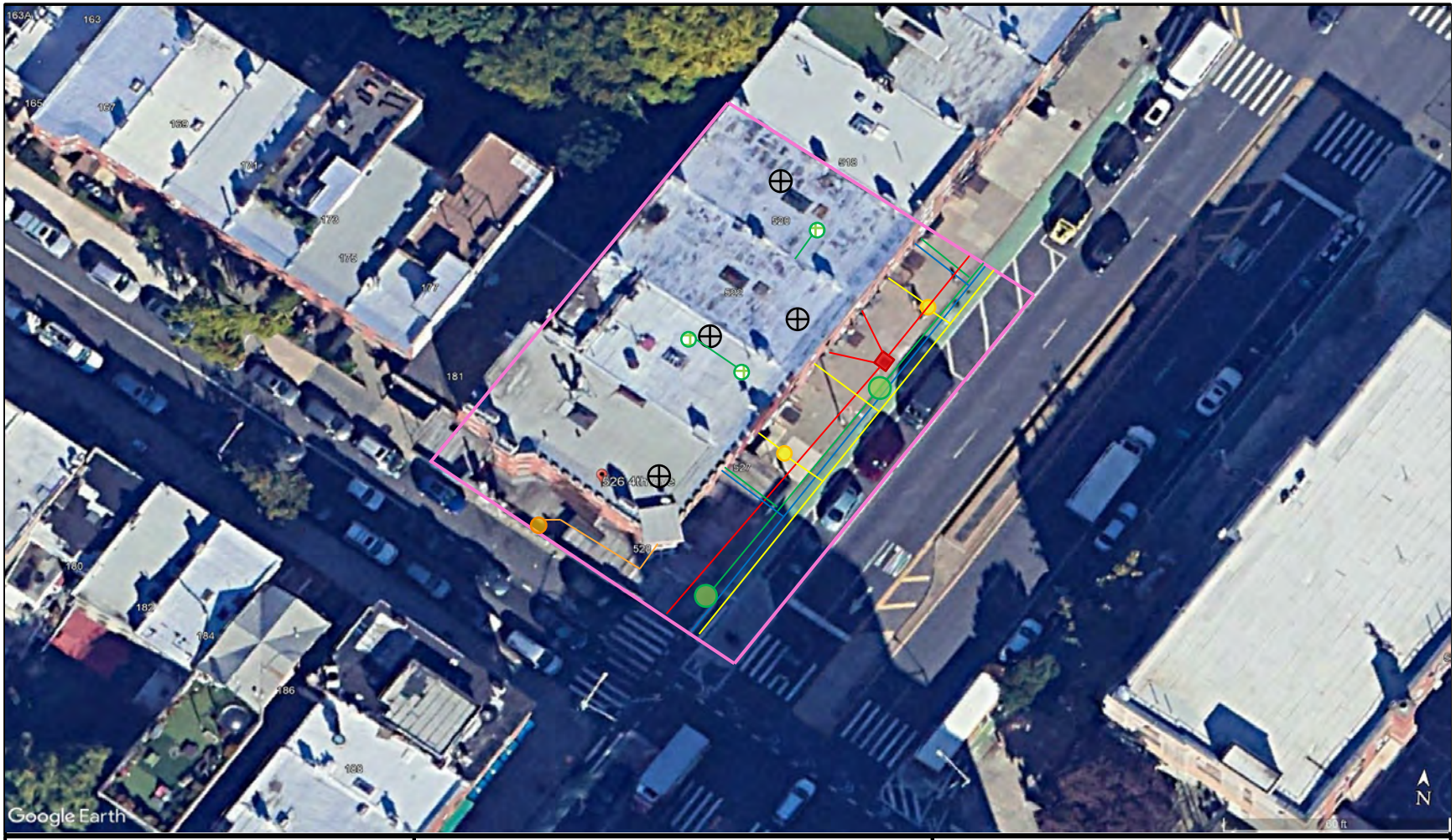
Site Location

SITE:	**Commercial/ Residential Property** 526 4th Ave, Brooklyn, NY 11215
CLIENT:	Haley Aldrich
DATE:	August 21st, 2024
AUTH:	Jason Staunton/ Tolga Yuksekbas

Legend



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SURVEY PLAN

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Legend

- Survey Area
- Sewage
- Electric
- Gas
- Water
- Communication
- Sewage Cover
- Floor drain
- Electric cover
- Gas cap
- Communication cover
- Proposed boring location

GEOPHYSICAL IMAGES

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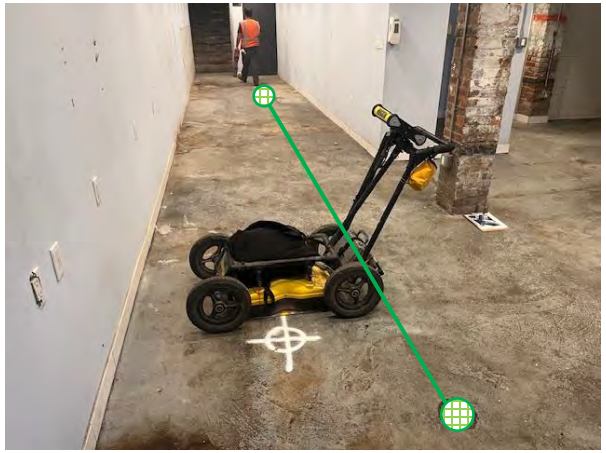

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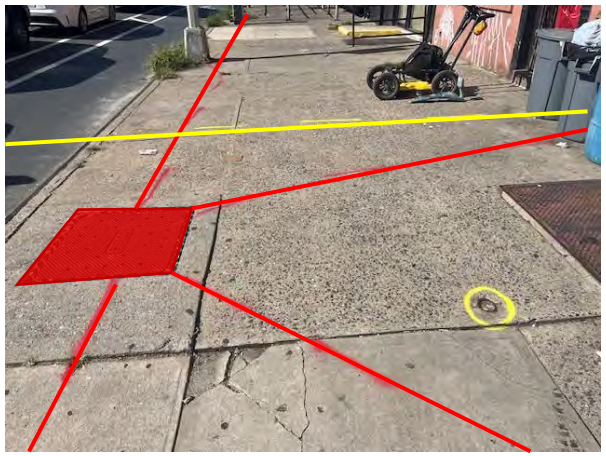

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