APPENDIX I

GEOPHYSICAL SURVEY REPORT BUILDINGS 3 & 8

HAGER-RICHTER
GEOSCIENCE, INC.

GEOPHYSICAL SURVEY
ATLAS PARK
QUEENS, NEW YORK

Prepared for:

Langan Engineering & Environmental Services, Inc.
21 Penn Plaza
360 West 31st Street, Suite 900
New York, New York 10001

Prepared by:

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Orange, New Jersey 07050

File 06J05
February, 2006

HAGER-RICHTER
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February 13, 2006
File 06J05

John Rhyner, P.E.
Langan Engineering & Environmental Services, Inc.
21 Penn Plaza
360 West 31st Street; Suite 900
New York, New York 10001

RE: Geophysical Survey
Atlas Park
Queens, New York

Dear Mr. Rhyner:

In this report, we summarize the results of a geophysical survey conducted on January 19 and 20, 2006 by Hager-Richter Geoscience, Inc. (H-R) at the above referenced site for Langan Engineering & Environmental Services, Inc (Langan). The scope of the survey and areas of interest (AOIs) were specified by Langan.

INTRODUCTION

The Site is located in a former industrial complex that is undergoing redevelopment. The site is located at the corner of 80th Street and Cooper Avenue in Queens, New York. The general location of the site is shown in Figure 1. Langan was interested in determining the location of subsurface structures such as steel and concrete vaults, cisterns, sumps, and USTs in two separate interior areas of interest (AOIs).

The geophysical survey was conducted in the interior of structures designated as Buildings 3 and 8. The approximate locations of the AOIs for the geophysical survey are shown in Figure 2. The buildings were vacant at the time of the survey

A preliminary interpretation was sent to Langan on February 3, 2006.

OBJECTIVES

The objectives of the survey were to search for, and if detected, to locate possible underground structures such as steel and concrete vaults, cisterns, sumps, and USTs in the accessible interior portions of the AOIs specified by Langan.

Geophysical Survey
Atlas Park
Queens, New York
File 06J05 February, 2006

THE SURVEY

Alexis Martinez, Juraj Peroncik, and José Carlos Cambero Calzada, of Hager-Richter conducted the field operations on January 19, 2006 and Alexis Martinez, and Juraj Peroncik on January 20, 2006. The AOIs were specified in the field by Mr. Arjun Patney, Mr. Clay Paterson and Mr. Brian Gochenaur of Langan.

The geophysical survey was conducted using complementary geophysical methods: time domain electromagnetic induction (EM61), ground penetrating radar (GPR), and precision utility locating (PUL). The EM61 data were acquired at approximately 8-inch intervals along lines spaced 5 feet apart across the accessible portions of the area of interest. The EM61 survey detects buried metal. However, the EM61 method cannot provide information on the type of objects causing the anomaly. In order to aid in the identification of the objects, a GPR survey was conducted along two mutually perpendicular directions, with lines spaced 5 feet in one direction, and 10 feet in the orthogonal direction.

At the time of the survey, Langan requested that drain pipes present in Building 3 be located. Tracking pipes was not part of the objectives specified by Langan prior to the field work. However, we used a PUL system for tracking drain pipes present in Building 3. The GPR and PUL findings were marked on the ground with spray paint.

EQUIPMENT

EM61. The EM survey was conducted using a Geonics EM61-MK2 time domain electromagnetic induction metal detector. The EM61-MK2 instrument was designed specifically for detecting buried metal objects such as USTs, drums, and utilities. An air-cored transmitter coil generates a pulsed primary magnetic field in the earth, thereby inducing eddy currents in nearby metal objects. The eddy current produces a secondary magnetic field that is sensed by two receiver coils, one coincident with the transmitter and one positioned 40 cm above the main coil. By measuring the secondary magnetic field after the current in the ground has dissipated but before the current in metal objects has dissipated, the instrument responds only to the secondary magnetic field produced by metal objects. Four channels of secondary response are measured in mV and are recorded on a digital data logger. The system is generally operated by pulling the coils configured as a trailer with an odometer mounted on the axle to trigger the data logger automatically at approximately 8-inch intervals.

GPR. The GPR survey was conducted using a Sensors & Software Noggin Plus Smart Cart digital subsurface imaging radar system. The system includes a survey wheel that triggers the recording of the data at fixed intervals, thereby increasing the accuracy of the locations of features detected along the survey lines. The GPR system was used with a 250 MHZ antenna and a 50 nsec time window.

PUL. The PUL survey was conducted using a precision electromagnetic pipe and cable locator, Radiodetection RD4000 series. The RD4000 series consists of separate transmitter and receiver. The system can be used in "passive" and "active" modes to locate buried pipes by detecting electromagnetic signals carried by the pipes. In the "passive" mode, only the receiver unit is used to detect signals carried by the pipe from nearby power lines, live signals transmitted along underground power cables, or very low frequency radio signals resulting from long wave radio transmissions that flow along buried conductors. In the "active" mode of operation, the transmitter is used to induce a signal on a target pipe, and the receiver is used to trace the signal along the length of the pipe. Our system uses a 10W transmitters.

LIMITATIONS OF THE METHODS

HAGER-RICHTER GEOSCIENCE, INC. MAKES NO GUARANTEE THAT ALL TARGETS WERE DETECTED IN THIS SURVEY. HAGER-RICHTER GEOSCIENCE, INC. IS NOT RESPONSIBLE FOR DETECTING TARGETS THAT CANNOT BE DETECTED BY THE METHODS EMPLOYED OR BECAUSE OF SITE CONDITIONS. HAGER-RICHTER IS NOT RESPONSIBLE FOR MAINTAINING MARKOUTS AFTER LEAVING THE WORK AREA. MARKOUTS MADE DURING INCLEMENT WEATHER OR IN HIGH TRAFFIC AREAS MIGHT NOT LAST.

EM61. The EM61 cannot detect non-metallic objects. The data from an EM61 survey are adversely affected by surface metal. The EM61 has a depth sensitivity limited to about 12 feet. The instrument is relatively cumbersome, and works best where the 1-meter square transmit and receive coils can be hand pulled in a small trailer.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a metal object, and the electromagnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.?). Although the EM61 data cannot be used to *identify* all buried metal objects, they provide excellent guides to the identification of some objects. For example, buried metal utilities produce anomalies with lengths many times their widths.

GPR. There are limitations of the GPR technique as used to detect and/or locate targets such as those of the objectives of this survey: (1) surface conditions, (2) electrical conductivity of the ground, (3) contrast of the electrical properties of the target and the surrounding soil, and (4) spacing of the traverses. Of these restrictions, only the last is controllable by us.

The condition of the ground surface can affect the quality of the GPR data and the depth of penetration of the GPR signal. Sites covered with snow piles, high grass, bushes, landscape structures, debris, obstacles, soil mounds, etc. limit the survey access and the coupling of the GPR antenna with the ground. In many cases, the GPR signal will not penetrate below reinforced concrete pavement, especially inside buildings, and a target may not be detectable.

The electrical conductivity of the ground determines the attenuation of the GPR signals, and thereby limits the maximum depth of exploration. For example, the GPR signal does not penetrate clay-rich soils, and targets buried in clay might not be detected.

A definite contrast in the electrical conductivities of the surrounding ground and the target material is required to obtain a reflection of the GPR signal. If the contrast is too small then the reflection may be too weak to recognize, possibly due to deeply corroded metal in the target, the target can be missed.

Spacing of the traverses is limited by access at many sites, but where flexibility of traverse spacing is possible, the spacing is adjusted to the size of the target.

PUL. The PUL equipment cannot detect non-metallic utilities, such as pipes constructed of vitrified clay, transite, plastic, PVC, fiberglass, and unreinforced concrete, when used in passive mode alone. Such pipes can be detected if a wire tracer is installed with access to such tracer for transmission of a signal or where access (such as floor drains and clean-outs) permits insertion of a device on which a signal can be transmitted.

In some, but not all, cases, the subsurface utility designation equipment cannot detect metal utilities reliably under reinforced concrete because the signal couples onto the metal reinforcing in the concrete. Similarly, the method commonly cannot be used adjacent to grounded metal structures such as chain link fences and metal guardrails.

In congested areas, where several utilities are bundled or located within a short distance, the signal transmitted on one utility can couple onto adjacent utilities, and the accuracy of the location indicated by the instrument decreases.

RESULTS

General. The geophysical survey consisted of an EM61 survey in the accessible interior portions of Buildings 3 and 8 followed by a GPR survey. At the request of Langan, a PUL survey was conducted in Building 3 where access to drain pipes connections was possible. Figures 3 and 4 are color contour plots of the EM61 results for Building 3 and 8 respectively, and Figures 5 and 6 show the locations of the GPR traverses and our integrated interpretation of the geophysical data for Buildings 3 and 8 respectively. GPR and PUL findings were marked on the ground with spray paint at the time of the survey.

EM61. Interpretation of EM61 data is based on the *relative* response (in millivolts) of the top and bottom instrument coils to local conditions. The differential response, the difference between the top and bottom coils, is commonly used as a sensitive indication of the location of buried metal objects, and is shown in the figures for this report. The instrument is not calibrated to provide an absolute measure of a particular property, such as the conductivity of the soil or the strength of the earth's magnetic field. Subsurface metal objects produce sharply defined positive anomalies when the EM61 is positioned directly over them. Acquiring data at short intervals along closely spaced lines, as was done at the subject site, provides high spatial resolution of the location of the targets. Thus, buried metal is recognized in contour plots of EM data by positive anomalies roughly corresponding to the dimensions of the buried metal.

Interpretation of EM61 data acquired in interior spaces is problematic. The contour plots for both Building 3 and Building 8 (Figures 3 and 4, respectively) exhibit widespread high amplitude EM anomalies. The EM anomalies could be due solely to the rebar in the concrete floor slab and/or other metal on the surface or in the building structure, or they could be due to subsurface structures such as vaults, cisterns, sumps, and USTs in addition to the rebar in the concrete slab, etc. Whether any of the EM anomalies is due to subsurface metal structures cannot be determined on the basis of the EM results alone.

GPR. A GPR survey was conducted along two mutually perpendicular directions, with lines spaced 5 feet apart in one direction, and 10 feet apart in the orthogonal direction. The locations of the GPR traverses are shown on Figures 5 and 6.

Apparent GPR signal penetration for most of the areas of interest was limited, with reflections received for about 15-20 nsec. Based on handbook time-to-depth conversions for the GPR signal in average soils, the GPR signal penetration is estimated to have been approximately 1.5 - 2.5 feet in both buildings.

The GPR records for the subject site do not exhibit reflections caused by large subsurface objects at the locations of EM anomalies. Large subsurface structures, such as vaults, cisterns, sumps, and USTs were not detected with the GPR in either Building 3 or Building 8. Whether such structures are present at a depth greater than the penetration depth of the GPR signal cannot be (approximately 1.5 - 2.5 feet) cannot be determined.

The GPR records do contain reflections typical of shallow utility line segments, and their locations are shown on Figures 5 and 6. Scattered small unidentified buried objects were detected with the GPR, and their locations are shown on Figures 5 and 6. The locations of the unidentified buried objects do not exhibit strong correlation with the EM results. The GPR records also confirm the presence of reinforcement in the concrete floor slabs of the two AOIs.

PUL. The PUL transmitter was attached to drain pipes in the interior of Building 3. Several pipes were identified inside Building 3 and in a portion of the exterior of the building, The locations of the possible drain pipes were marked on the ground with spray paint and are shown in Figure 5.

CONCLUSIONS

Based on the geophysical survey performed by Hager-Richter Geoscience at Atlas Park in Queens, New York, we conclude that:

- Vaults, cisterns, sumps or USTs were not detected under the floor slabs in the areas investigated with EM61 and GPR in Building 3 and Building 8, but whether such structures are present cannot be determined firmly because 1) the EM61 data were strongly affected by rebar in the concrete floor slabs and other metal in the buildings, and 2) the GPR signal penetration was limited to approximately 1.5 - 2.5 feet. *Whether vaults, cisterns, sumps, or USTs occur at a depth greater than the effective depth of penetration of the GPR signal or in areas inaccessible to the geophysical survey cannot be determined.*

LIMITATIONS ON USE OF THIS REPORT

This letter report was prepared for the exclusive use of Langan Engineering & Environmental Services, Inc (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

H-R has used reasonable care, skill, competence and judgment in the performance of' its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

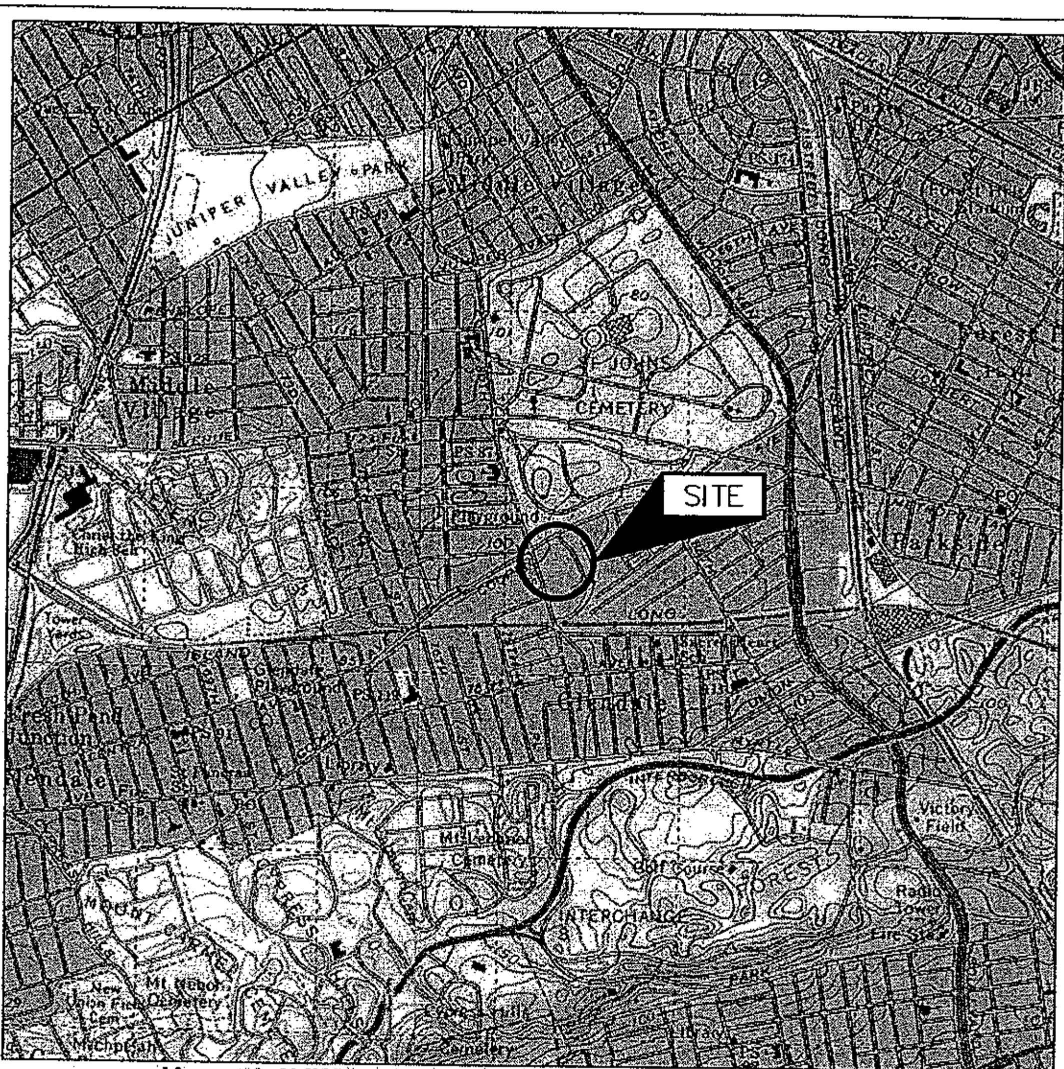
If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with Langan on this project. We look forward to working with you again in the future.

Sincerely yours,
HAGER-RICHTER GEOSCIENCE, INC.

Jeffrey Reid
Project Manager

Dorothy Richter, P.G.
President

Attachments: Figures 1 - 6



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

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H-R

LOCATION

SCALE (feet)

0 2000 4000

Figure 1 General Site Location Atlas Park Queens, New York	
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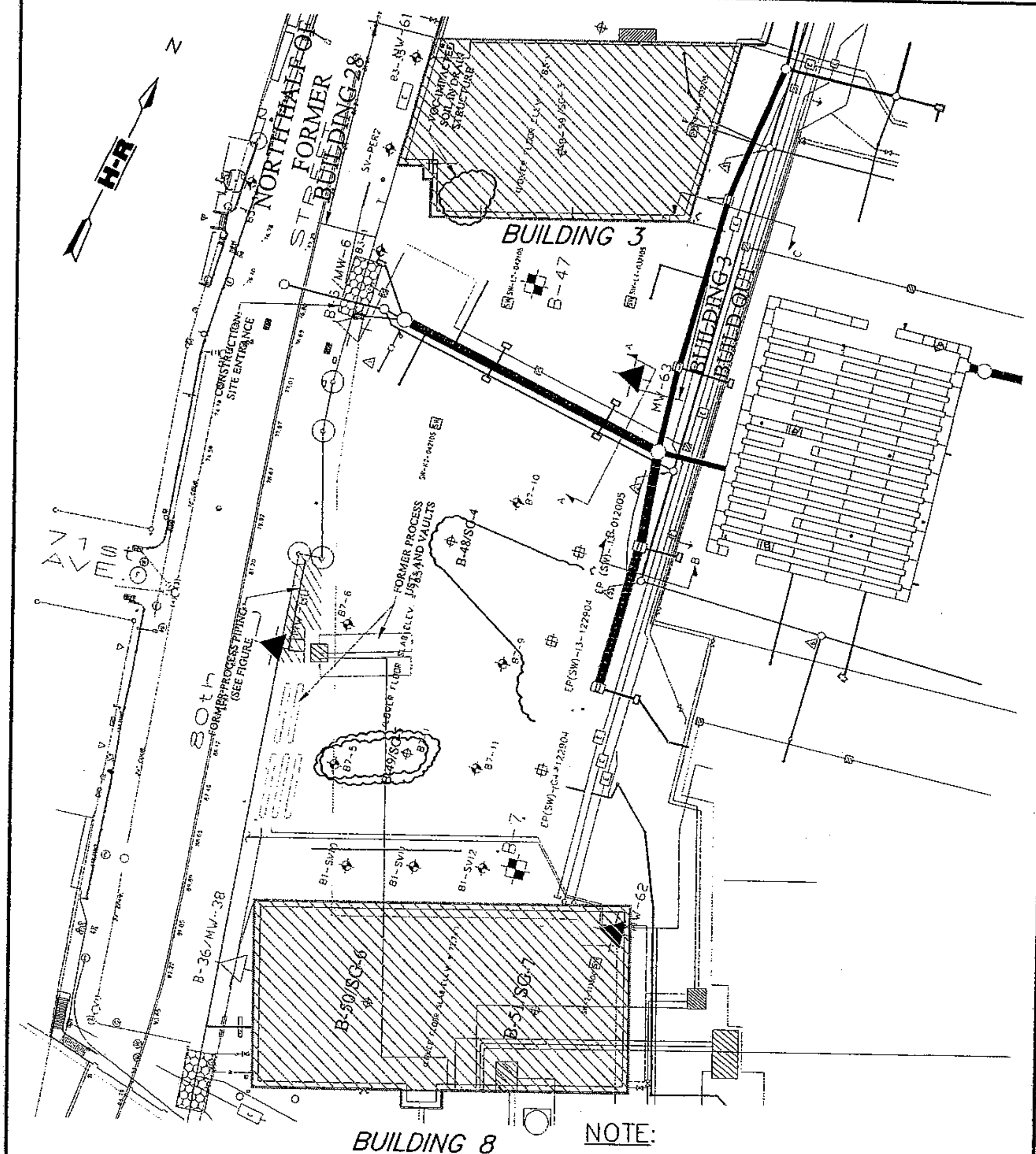

NOTE:

Modified from site plan provided by Langan Engineering & Environmental Services, Inc.

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APPROXIMATE LIMITS OF GPR SURVEY AREA

SCALE (feet)

0 80 160

Figure 2 Site Plan Atlas Park Queens, New York	
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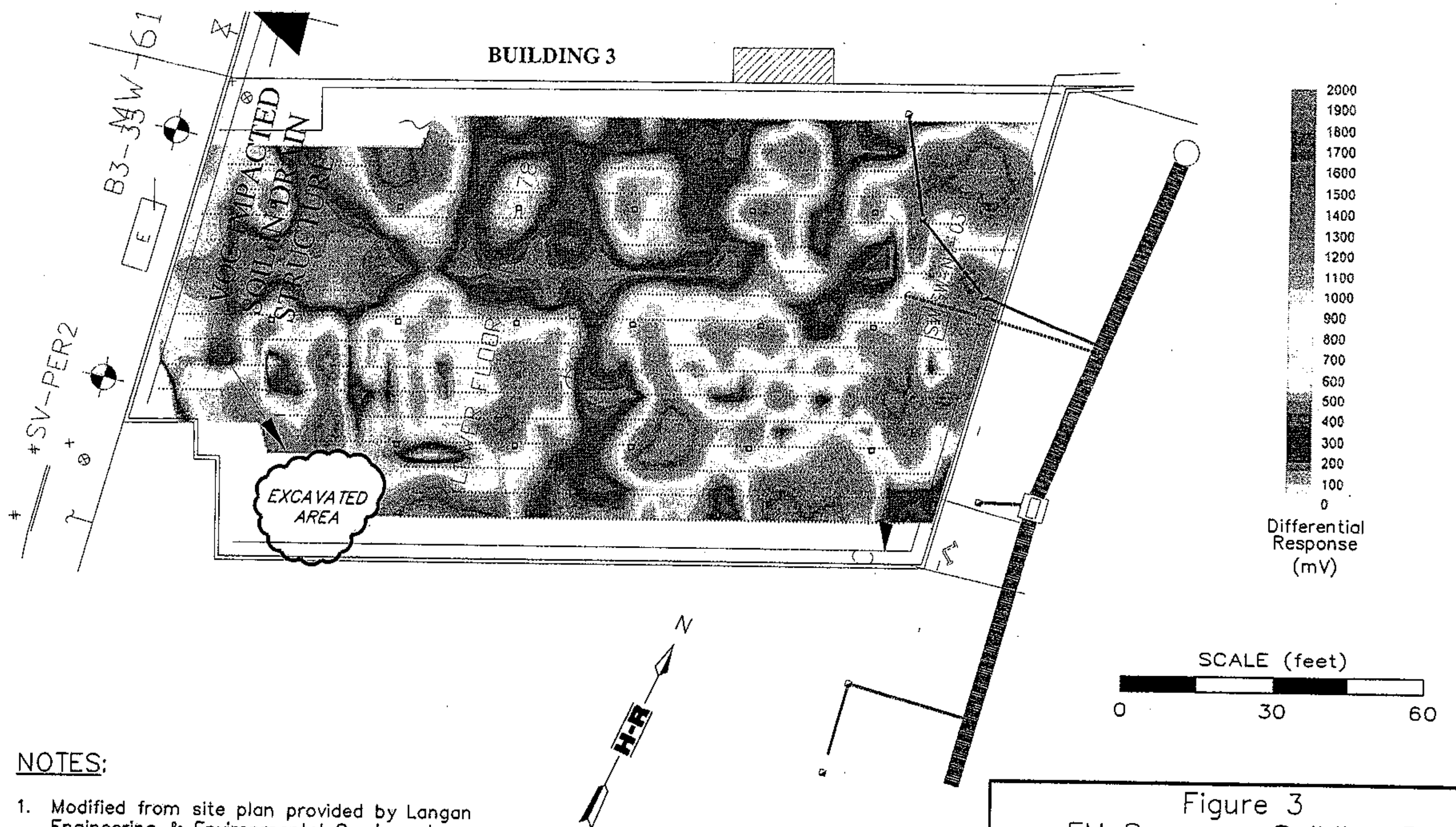

NOTES:

1. Modified from site plan provided by Langan Engineering & Environmental Services, Inc.
2. All column centers can be used as reference points in relation to the geophysical survey.
3. Data were acquired with Geonics EM61. Differential response shown.
4. Differential response equals top coil response – bottom coil response.

LEGEND

....	DATA STATIONS
▫	COLUMN

Figure 3
EM Survey – Building 3
Atlas Park
Queens, New York

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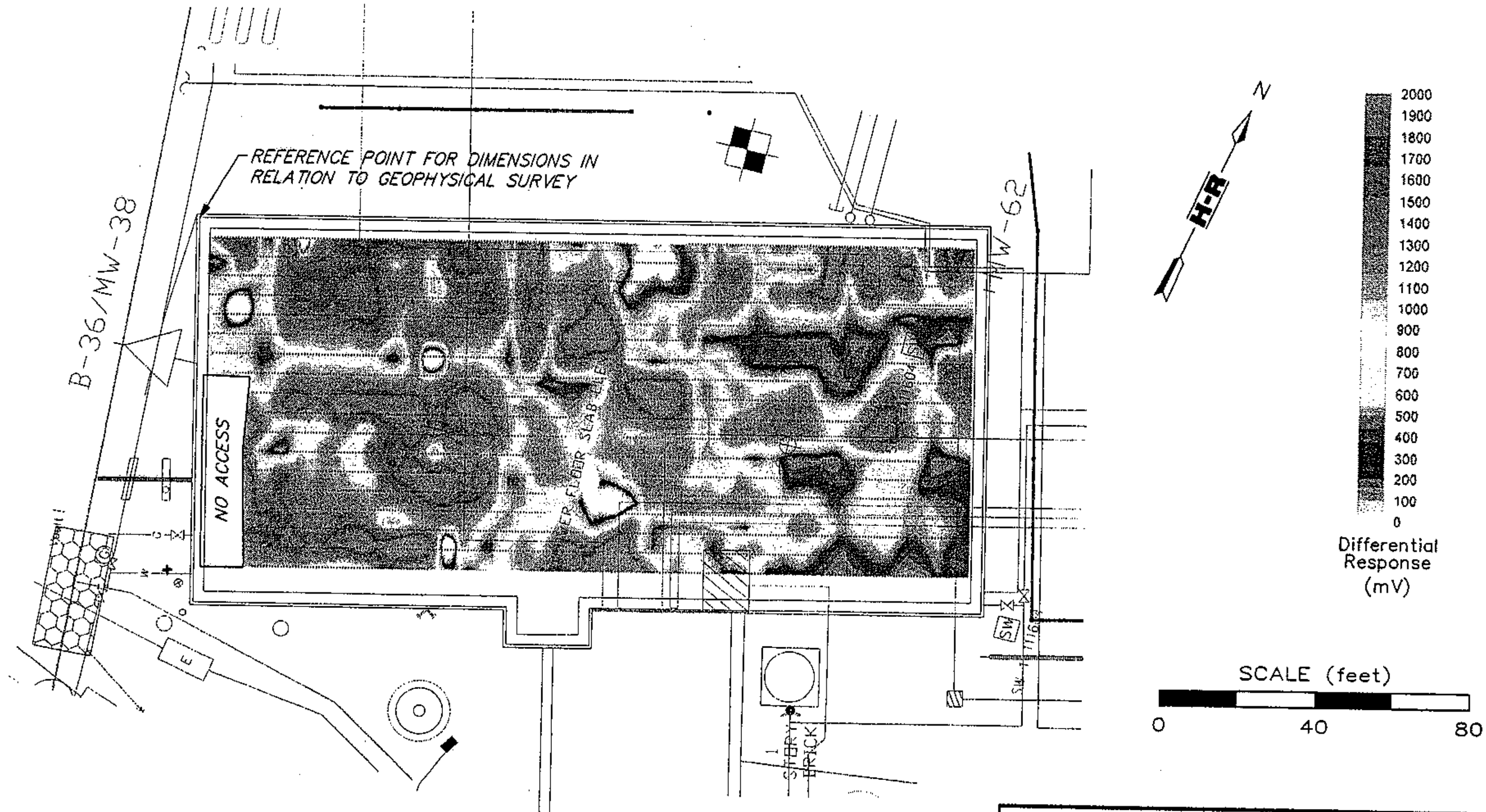
Orange, New Jersey



NOTES:

1. Modified from site plan provided by Langan Engineering & Environmental Services, Inc.
2. Data were recorded with Geonics EM61. Differential response shown.
3. Differential response equals top coil response – bottom coil response.

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.... DATA STATIONS

Figure 4 EM Survey – Building 8 Atlas Park Queens, New York	
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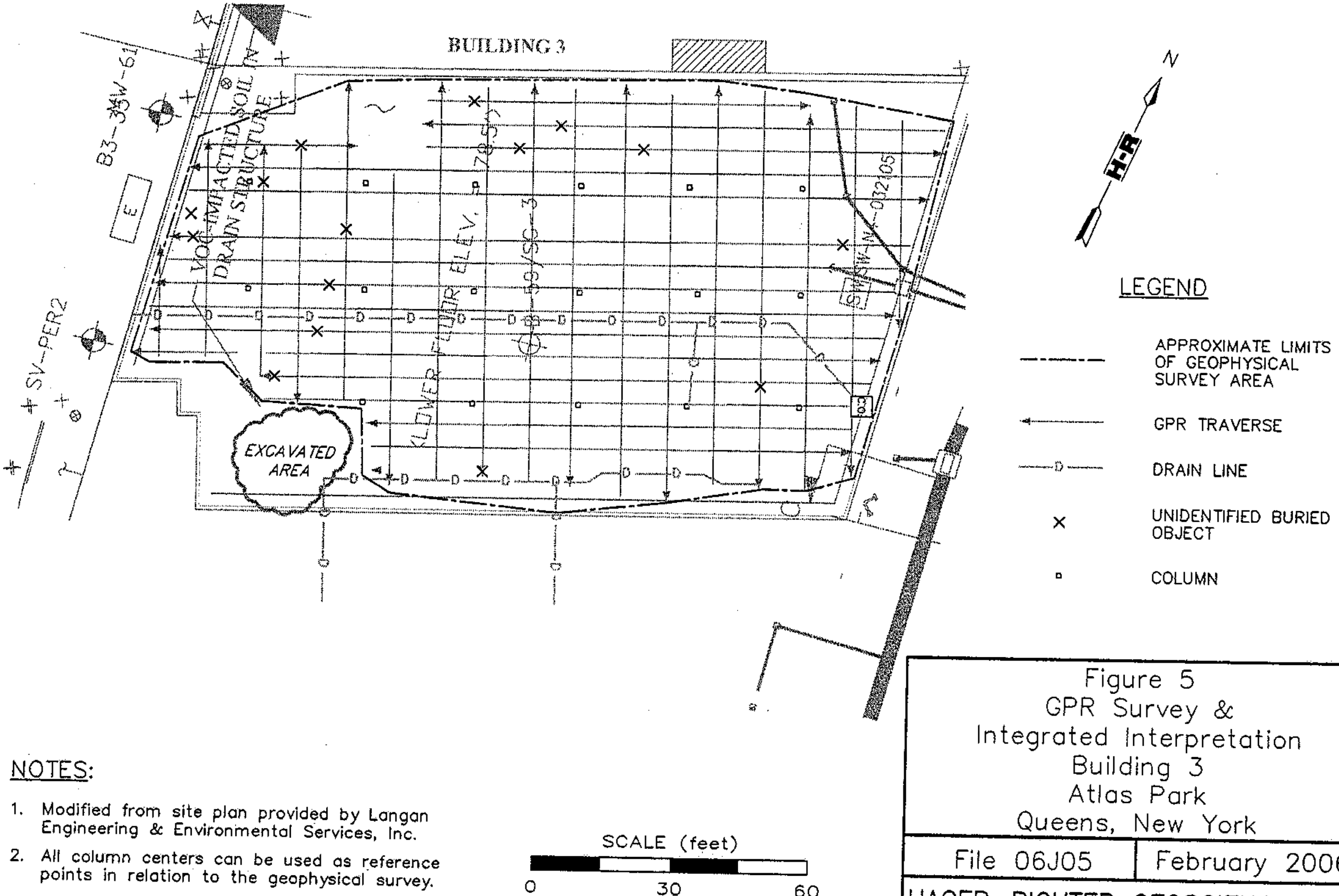

NOTES:

1. Modified from site plan provided by Langan Engineering & Environmental Services, Inc.
2. All column centers can be used as reference points in relation to the geophysical survey.

Figure 5
GPR Survey &
Integrated Interpretation
Building 3
Atlas Park
Queens, New York

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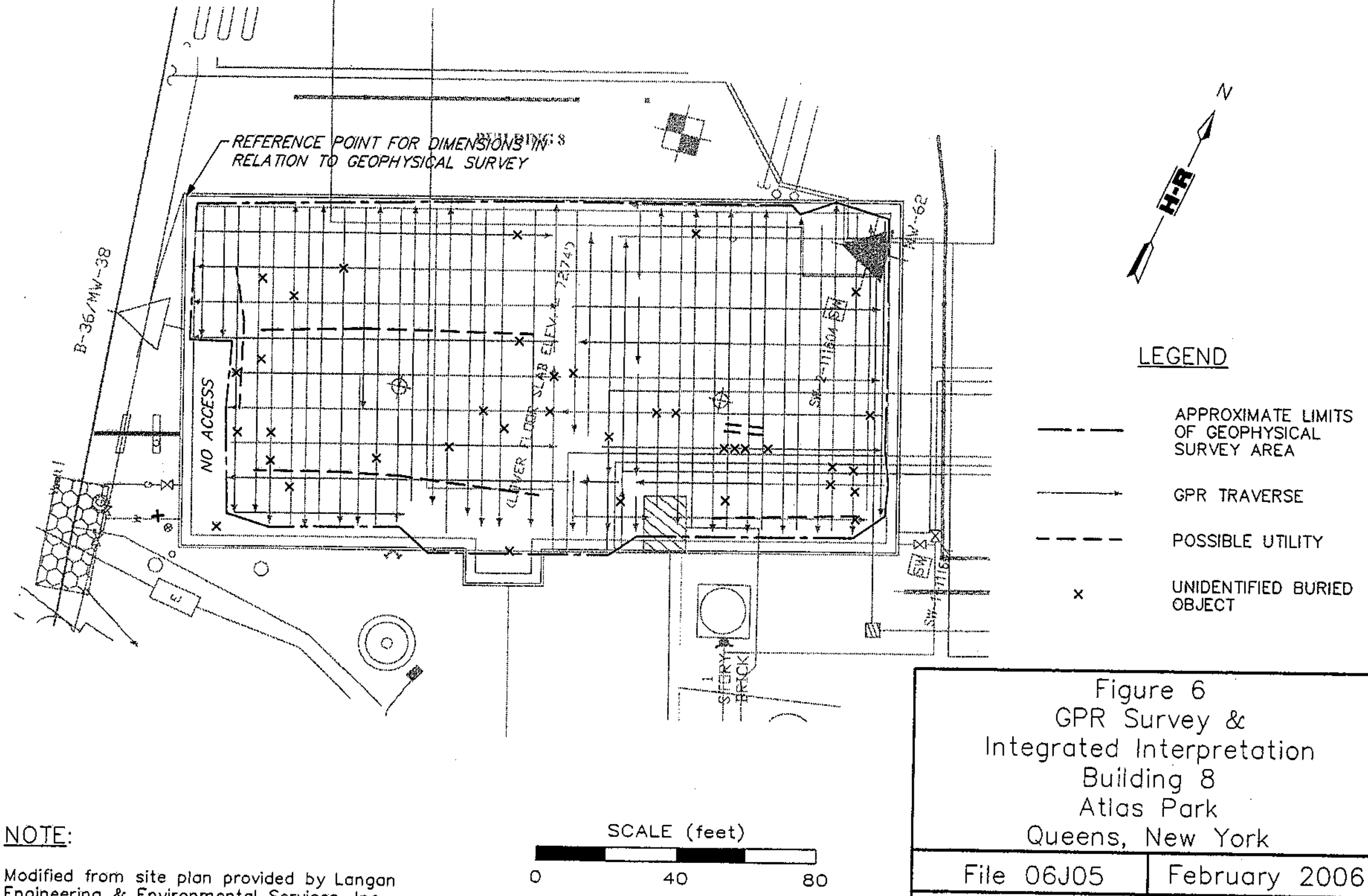
HAGER–RICHTER GEOSCIENCE, INC.
Orange, New Jersey



NOTE:

Modified from site plan provided by Langan Engineering & Environmental Services, Inc.

Figure 6
GPR Survey &
Integrated Interpretation
Building 8
Atlas Park
Queens, New York

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HAGER–RICHTER GEOSCIENCE, INC.
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