Ground Penetrating Radar Survey Report:

Preliminary Print House Exploration

For the Kirtland Temple Historic Center

Kirtland, Ohio

Data Acquired August 16, 2002

Report compiled May 2003

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Introduction

As is documented in information provided by the Kirtland Temple Historic Center, a Schoolhouse / Printing Office is known to have existed and was subsequently burned to the ground in 1838 somewhere near the site of the existing Kirtland Temple in Kirtland, Ohio. This structure will be referred to herein as the Print House.

Responding to the request of the Historic Sites Coordinator of the Kirtland Temple Historic Center, on August 16, 2002, Mnemotrix Systems, Inc. performed a preliminary GPR Survey to assist in determining the possible location of the Print House for potential further archaeological study.

The Print House is described as "a large frame structure located adjacent to the west side of the temple" and of the proportions of 30 x 38 feet. A diagram of the area where the Print House has been thought to be is shown in Figure 1 below:

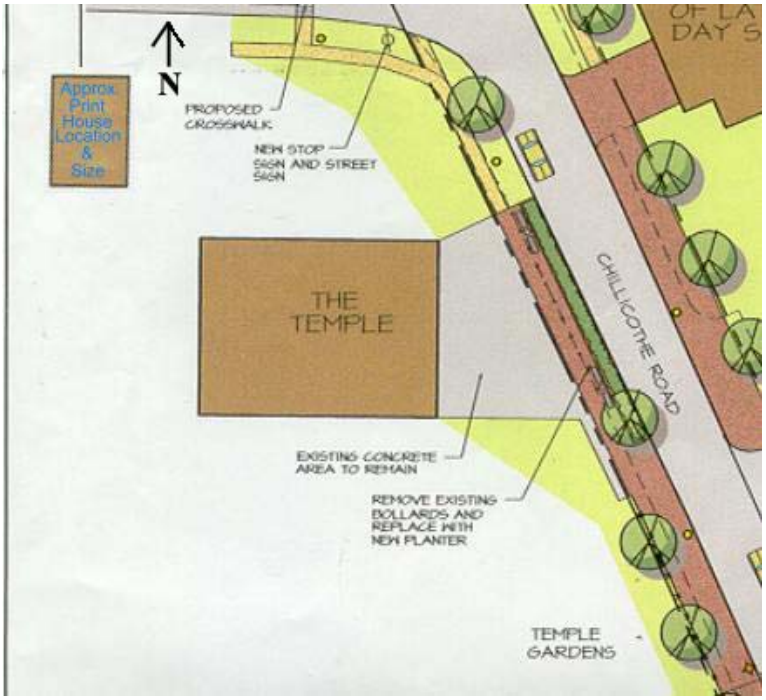

Figure 1: The Print House is shown to the west of the Kirtland Temple.

Actions Taken

The historical data concerning the structure and location of the Print House was studied. After careful consideration of this data, a consensus was reached as to the broad area behind the Temple where the Print House might have been located. Given a limited amount of time for a preliminary survey, a subset of this target area was chosen which was most easily accessible as well as indicative of the subsurface area.

An area of 40 x 43.5 feet was marked out overlapping the parking lot behind the Temple. A Ground Penetrating Radar (GPR) Survey was done over this area with the intent of seeing what lay below.

The equipment used consisted of a SIR-2000 (Subsurface Interface Radar) system with a 400 MHz antenna and survey wheel, manufactured by Geophysical Survey Systems, Inc. (GSSI). The 400 MHz antenna was chosen for best possible resolution in the uppermost 6 feet.

The surveyed area is shown in Figure 2 marked in red. These lines are intended for orientation purposes rather than as an exact demarcation.

Figure 2: 40 x 43.5 foot area surveyed using GPR techniques.

Overlapping data was collected in the form of two perpendicular sets of survey lines, or a *survey grid*. These two sets are herein referred to as Dataset I and Dataset II, and are shown in Figures 3 and 4 below.

Dataset I consisted of 24 survey lines evenly spaced at approximate intervals of about 1.7 feet. These were acquired in a zigzag pattern from west to east and then east to west, as shown in Figure 3. Dimensions were 40.0 x 43.5 feet.

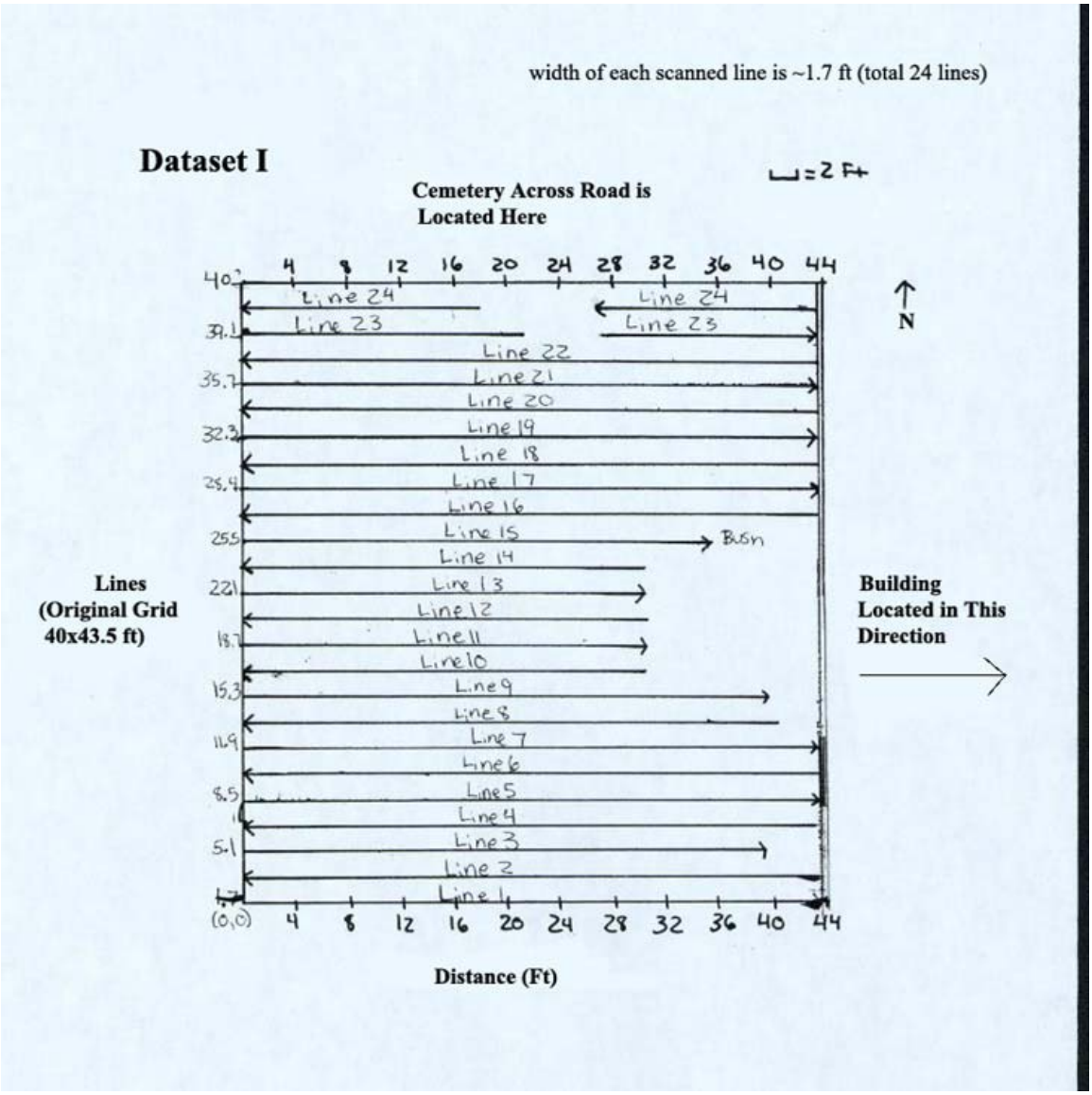

Figure 3: Dataset I with E/W Survey Lines

Dataset II was acquired overlapping Dataset I in a perpendicular direction. Dataset II consisted of 24 survey lines evenly spaced about 1.3 feet apart over a slightly smaller subset area of Dataset I. Exact dimensions are shown in Figure 4.

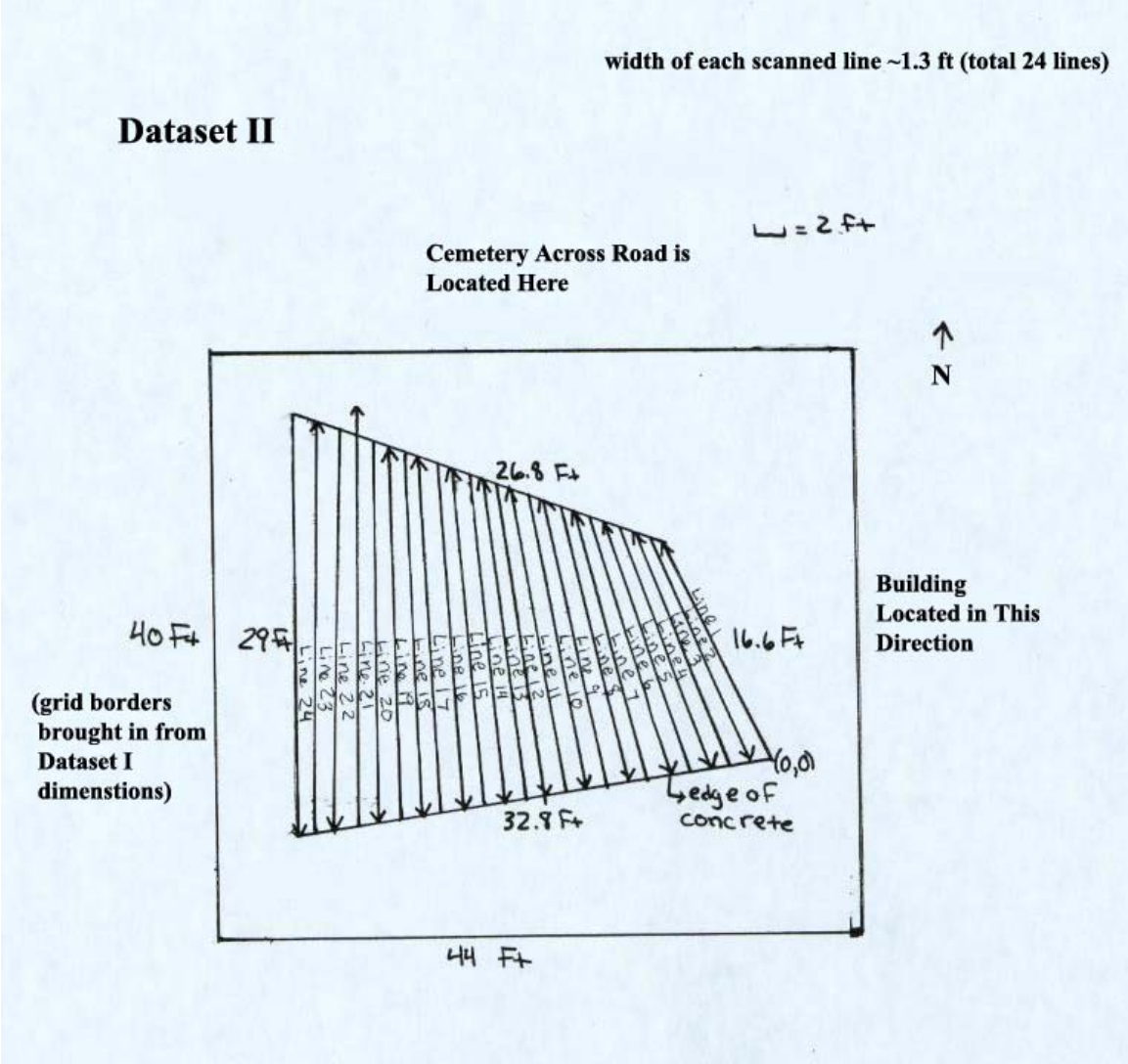

Figure 4: Dataset II with N/S Survey Lines

In both datasets, survey lines were acquired as close together as possible in order to give a thorough contiguous view of the area. Post-processing and evaluation of the survey grid described above resulted in the following observations.

Observations

On a visual surface inspection, the ground area around the Kirtland Temple is dry and hard-packed. Shale and other typical NE Ohio rocks are present.

What could be discerned through GPR imaging in the surveyed area, which is worthy of note, is the following:

1. The presence of metal ringing, marking what is very likely to be known cable or piping laid in recent times;
2. A "slab" of homogenous material approximately 21 feet long, 6 feet wide, and about 8.5 inches thick, located about 1-2 feet beneath the surface; and,
3. A continuous layer of cobbled material 2-3 feet beneath the surface.

These features are shown in Figure 5 and 6 below. Figure 5 shows the full length (calculated to be ~21 feet) of the slab and was taken from Dataset II. Figure 6 shows a cross section of the width (calculated to be ~6 feet) of the slab taken from Dataset I.

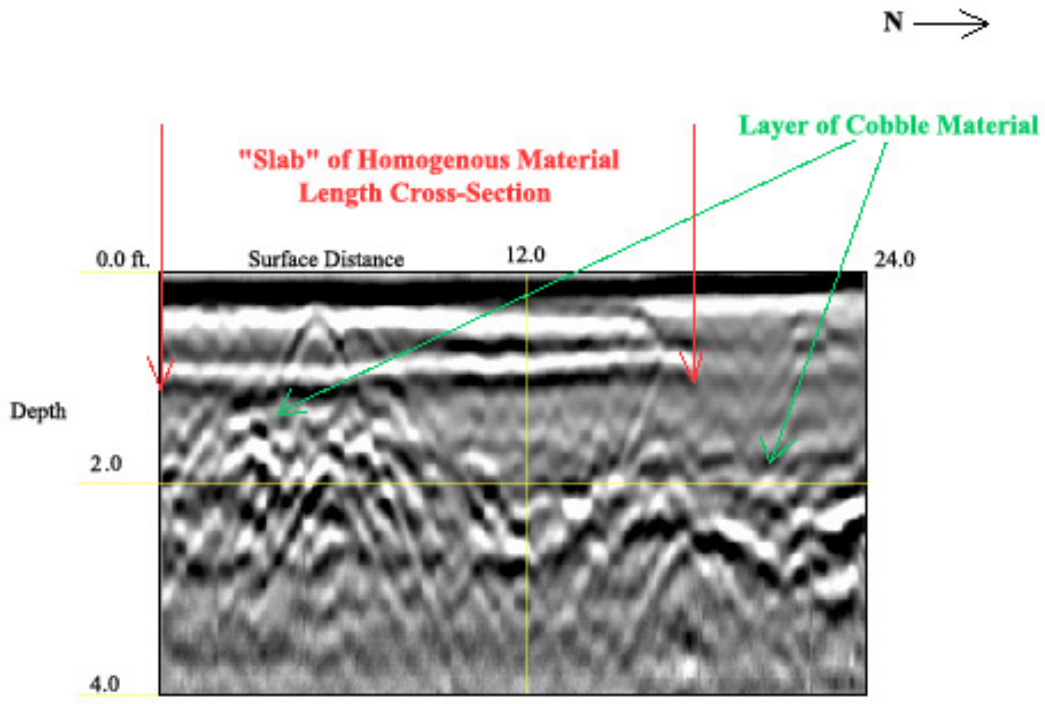

Figure 5: GPR Survey profile of sub-surface area extending to a depth of 4 feet, acquired in a N-S direction taken from Dataset II.

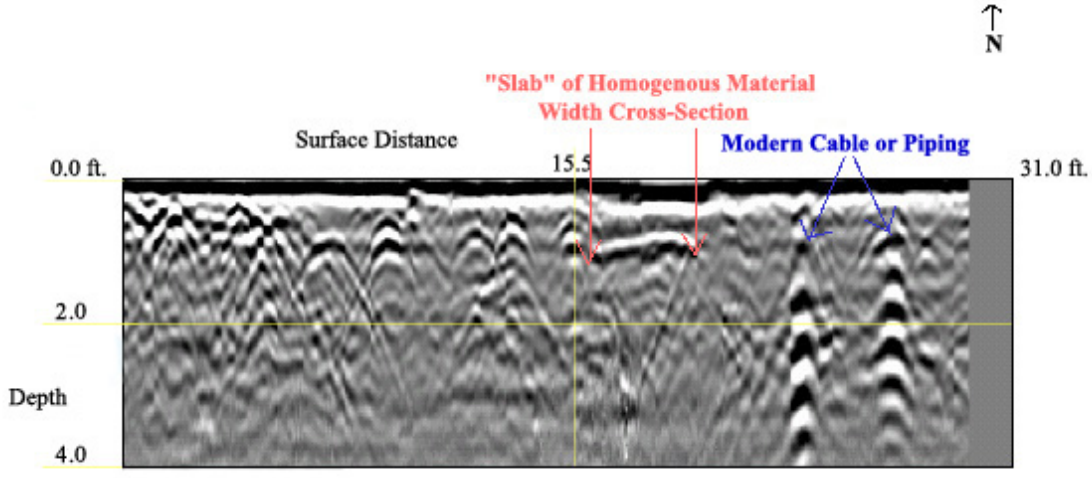

Figure 6: GPR Survey profile of sub-surface area extending to a depth of 4 feet, acquired in a W-E direction taken from Dataset I.

Further Discussion

Post-processing of the data included careful measurements to determine the real location of the slab, which appears to be near the walkway towards the back of the Temple, but not in line with it, veering off to the west. Perhaps it is a slab left over from the foundation of the Temple, or from a separate structure. Note that this slab extends to the very edge of the surveyed area, so may continue beyond what could be seen here.

Of perhaps more interest is the cobble layer beginning 2-3 feet beneath the surface. Cobble-sized rocks are 50-100 mm in diameter, slightly larger than the typical pebble-sized rock. This layer extends throughout the surveyed area and can be assumed to continue past these boundaries.

What is significant about this layer is that it clearly differs from what is above and below it. Therefore, it indicates that at one time, a disturbance of some sort created this effect. We could guess that it may be the remnant of fill from past construction or may even be remnants of a previously destroyed structure. In any case, further investigation may point to further knowledge about the location of the Print House.

It is not possible to say what this layer is without looking further, but some excavation would reveal its nature, and suppositions could then be made as to the best strategy for continued excavation.