

SURVEY RESULTS

2002 / 89 Merton Abbey Mills, London

1. Survey Areas

- 1.1 Two areas were investigated by geophysical techniques. Site 1 was surveyed using GPR, due to the nature of the ground surface, while Site 2 was investigated by resistance survey. The location of the two areas are shown on Figure 1 at a scale of 1:500. As can be seen from Figure 1, Area B comprises a small section of Area A that was resurveyed at closer intervals after paving slabs had been removed.
- 1.2 The survey grid was set out by *GSB Prospection* and tied in to the base map by Dr Henry Chapman using a Trimble GPS system.

2. Display

- 2.1 The GPR data from Site 1 are displayed in Figures 2 - 7 as time slice maps and radargrams.
 - 2.1.1 Time slice maps combine the data from all the traverses and provide a plan view of the results at different times or depths. Two sets of time sliced data are provided for each area. The first show data that have been slightly smoothed and background removal applied. This reduces strong horizontal reflections such as those seen near the surface enabling more subtle near surface reflections to be observed. The second set of time slice maps have not had any background removal applied. Although this noticeably reduces the clarity of near surface features, it enhances reflections from horizontal interfaces rather than point sources, which may be archaeologically significant.
 - 2.1.2 The radargrams display the individual data lines and represent vertical sections through the ground. Only a selection of the radargrams is included in the report.
- 2.2 Figure 8 displays greyscale images of the resistance data collected at Site 2, at a scale of 1:500. An accompanying interpretation diagram is provided in Figure 9 at the same scale.
- 2.3 Numbers indicate GPR responses while letters refer to resistance anomalies highlighted on the relevant diagrams.

3. Theory and Methodology of Ground Penetrating Radar (GPR)

- 3.1 The primary advantage of GPR is its ability to provide a three dimensional view of a buried site. A short pulse of energy is emitted and echoes return from interfaces with differing dielectric constants. These reflections may respond to the changes at the interface between strata or materials. The travel times are recorded and converted into depth measurements, giving a depth section.

- 3.2 The equipment consists of a battery pack to generate the signal, a transmitter and receiver antenna system, which is dragged by an operator along a traverse, and connecting cables. The unit is controlled by a portable computer that also records all the reflections. This allows the data to be viewed in real time while on site and subsequent processing techniques to be applied to improve the quality of the image.
- 3.3 The GPR technique relies on dielectric contrast between differing materials. Under suitable conditions the following features may be identified: walls, floors and rubble spreads; refilled pits and ditches; voids e.g. tunnels and chambers; buried paths and roadways; stone coffins and soil / bedrock interfaces.

4. General Considerations - Complicating Factors

- 4.1 A 450MHz antenna was used for the GPR investigations due to the shallow depth of the expected archaeology and the need for high resolution near surface data. This antenna will record data up to a depth of around 1m – 2m but is dependent on the nature, in particular the water content, of the subsoil.
- 4.2 While depths have been indicated on the GPR time slice maps and radargrams, these have to be viewed with caution. The conversion from time to depth depends on the velocity of the electromagnetic signal through the ground. Given the nature of the site, this is likely to vary markedly over a small distance, as a result, any depth conversion is only an approximation. An average velocity of 0.08m/ns has been used for the time to depth conversions.
- 4.3 Where there is a strong electromagnetic contrast, the GPR signal can be inter-reflected or reverberated and this produces a delay in the reflection of the signal. This is termed 'ringing'. This happens, to some extent, with all reflections and results in a greater apparent depth than actually exists. As a result, it is often not possible to detect the base of features; only the tops of buried features/deposits are detected with certainty.

5. Site 1 – Ground Penetrating Radar Survey

Area A

- 5.1 The dominant near-surface anomalies visible on the time slice maps are due to the change from grass to a concrete path (1) and the edge of paving slabs (2). The broad band of high amplitude response (3) and (4) in the 0.30m – 0.45m time slice map can similarly be attributed to the modern made ground. The clearly defined deeper reflections are due to ringing of the signal over reinforced concrete within the path (3).
- 5.2 The clearest reflections of possible archaeological interest (5) lie in the southeast corner of the survey area. These suggest a substantial wall although interpretation at the time was cautious due to the proximity of an extant building and a metal fence adjacent to the southeast corner of the survey area. Excavation revealed a large flint wall used for construction of one end of a building.
- 5.3 To the west of this wall, and throughout the southern portion of the survey area, a complex of brick walls associated with the mill complex was revealed during excavation. There is no clear correlation between the excavated features and anomalies in the GPR data. The most likely explanation is that there was insufficient contrast between the brick and the surrounding dry clay soil.

Area B

- 5.4 A small portion of Area A was re-surveyed following the removal of paving slabs. In this instance data were collected along parallel traverses 0.25m apart, rather than 0.5m as for Area A. In addition the data were collected in an approximately east - west direction, rather than north - south as for Area A. The latter was due to the size and shape of the survey area available.
- 5.5 No substantial anomalies are present in the GPR data, although several discrete responses of possible interest have been noted. In the 0.45m – 0.60m time slice map two anomalies (6) and (7) are of possible interest as they coincide with the projected footprint of a building shown on earlier plans.
- 5.6 In the 0.60m – 0.75m map a coherent response (8) is visible and at a depth of 1.05m – 1.20m a further well-defined anomaly (9) is apparent. While these may be of archaeological interest their lack of extent suggests a natural origin or that they are the product of debris rather than intact structures.

6. Site 2 – Resistance Survey

- 6.1 A small area was investigated by resistance survey. The area was surveyed using two different probe separations. A spacing of 0.5m typically investigated the top 0.75m while the 1m spacing can detect substantial features up to 1.5m beneath the ground. The wider spacing was undertaken because it was thought that the archaeology could be at some depth due to material, mostly clay, subsequently deposited on the site.
- 6.2 Very low resistance (A) was recorded along the southern limit of the survey which was adjacent to an electricity pylon. It is unlikely that the pylon itself is causing the low resistance readings. However, ground disturbance associated with construction of the pylon could explain the low readings.
- 6.3 Several discrete areas of high resistance are apparent in the data. Those along the eastern edge (B) are most likely modern in origin as tarmac was apparent through the vegetation. The high resistance response (C) is curious since it does not fit with the expected archaeology. Its location adjacent to the path and near a known gas main suggests a modern origin, although an archaeological one cannot be dismissed. The more diffuse high resistance zones are likely to be due to pedological or vegetational variations.

7. Conclusions

- 7.1 The GPR survey at Site 1 was complicated by the varied ground cover, grass, concrete and paving slabs. A few responses of possible interest were located in the data. However, it became clear following excavation that the GPR was only detecting the flint wall and not the brick walls of the mill complex. It would appear that there was too little contrast between these brick walls and the surrounding dry clay soils.
- 7.2 Resistance survey at Site 2 located few anomalies of possible interest and interpretation of the data was complicated by paths, a gas main, a pylon and the nature of the vegetation.

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Project Assistants: Dr S Ovenden-Wilson, M Saunders and C Stephens

Date of Survey: 25th – 27th September 2002
Date of Report: 17th January 2003

SITE SUMMARY SHEET

2002 / 89 Merton Abbey Mills, London

NGR: TQ 263 698

Location and topography

The site lies within the Merton Abbey Mills craft market complex in southwest London. The areas under investigation are situated either side of the River Wandle. The main area of interest occupies a small paved and grassed area to the east of the river. The second area lies to the west of the river and occupies a generally level pasture field.

Archaeology

The areas investigated cover the 19th Century remains of the first Liberty Print works. The site was very important in the Arts and Crafts movement. Previously Merton Abbey stood on this site and it appears that some of the Abbey buildings were incorporated into the print works.

Aims of Survey

Ground penetrating radar (GPR) and a small amount of resistance survey were undertaken with the aim of locating and defining the nature and extent of buried archaeological remains. The geophysical investigations forms part of a wider archaeological excavations being undertaken as part of Channel 4's **Time Team** series.

Summary of Results *

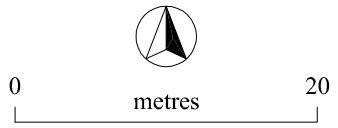
GPR survey undertaken to the east of the river (Site 1) over the suspected location of the print works produced mixed results. While several anomalies of interest were visible in the data, excavation revealed far more walls/features than suggested by the GPR data. It would appear that the GPR was detecting the flint walls associated with the Abbey rather than the brick walls associated with the print works. This is most likely due to insufficient dielectric contrast between the brick walls and the surrounding dry clayey soil.

Resistance survey to the west of the river (Site 2) failed to identify any clearly defined anomalies of archaeological interest.

*** It is essential that this summary is read in conjunction with the detailed results of the survey.**

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GSB PROSPECTION
PROJECT: 2003/89 Merton Abbey Mills
TITLE: Location Diagram
Based on a map provided by Time Team

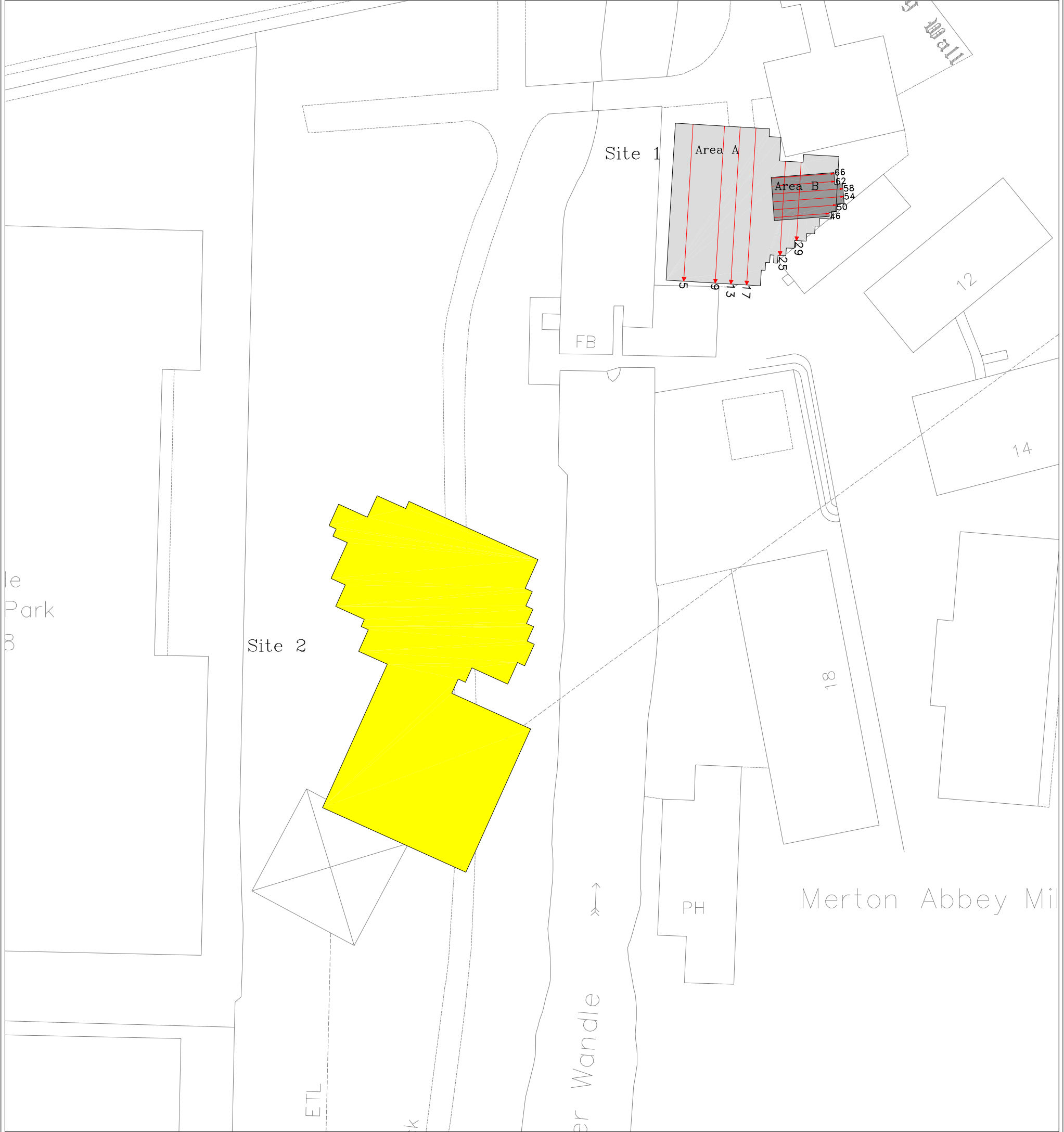


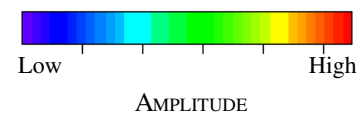
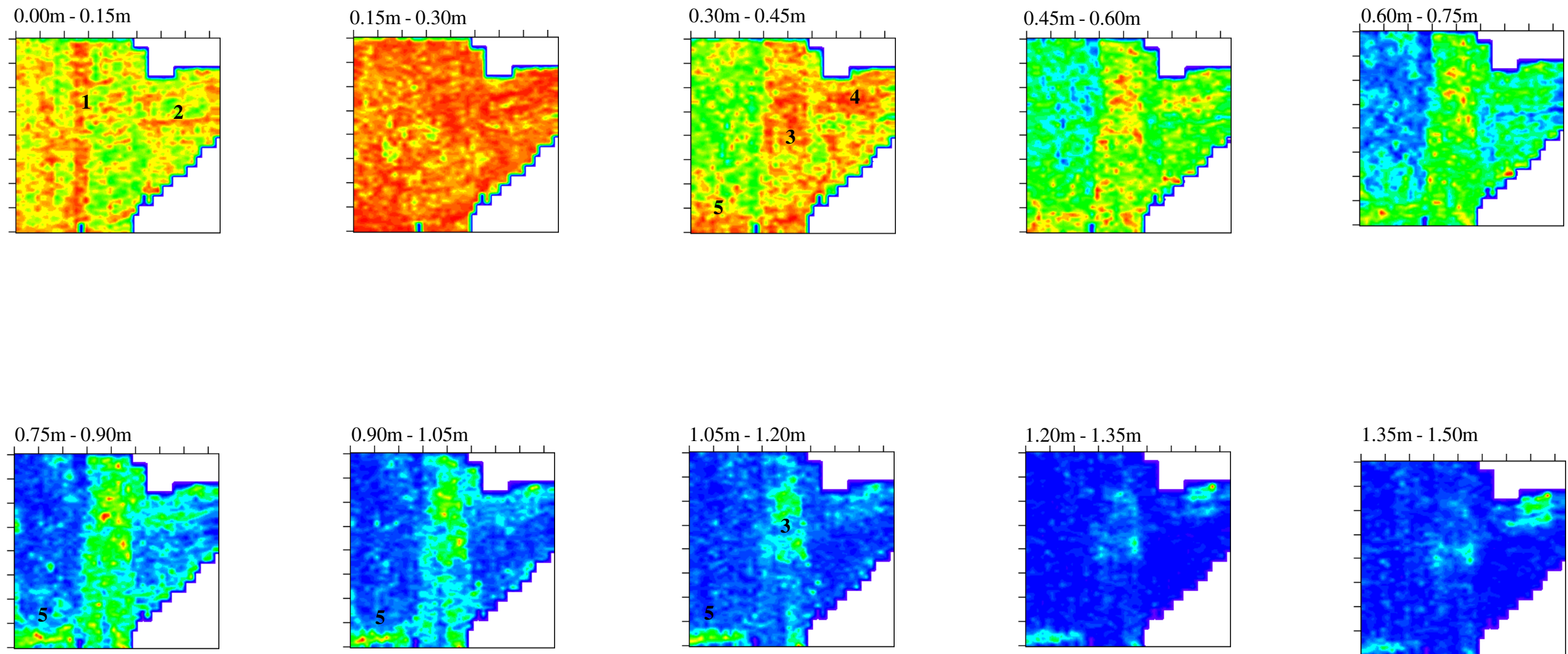
Figure 1

MERTON ABBEY MILLS

Site 1 - Area A

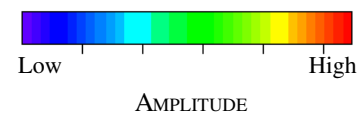
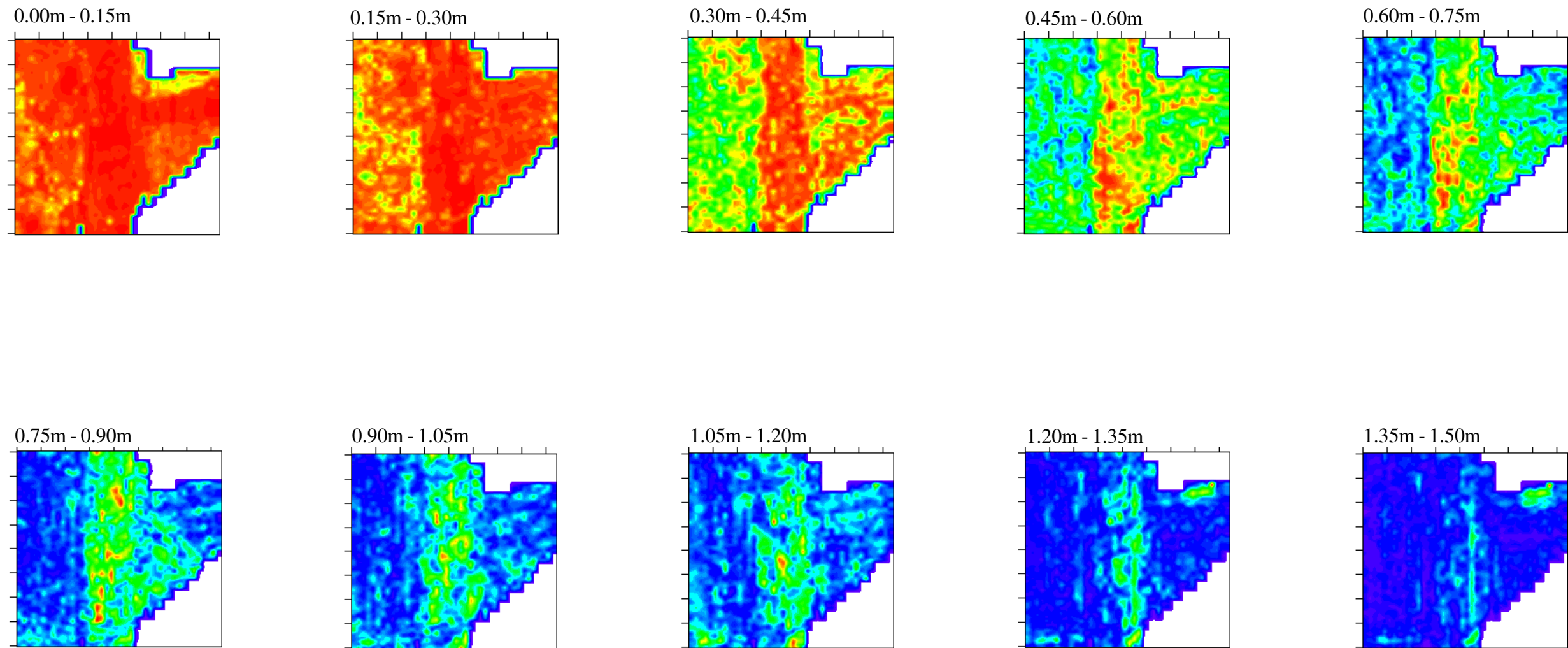
GPR Time Slice Maps

(With Background Removal)



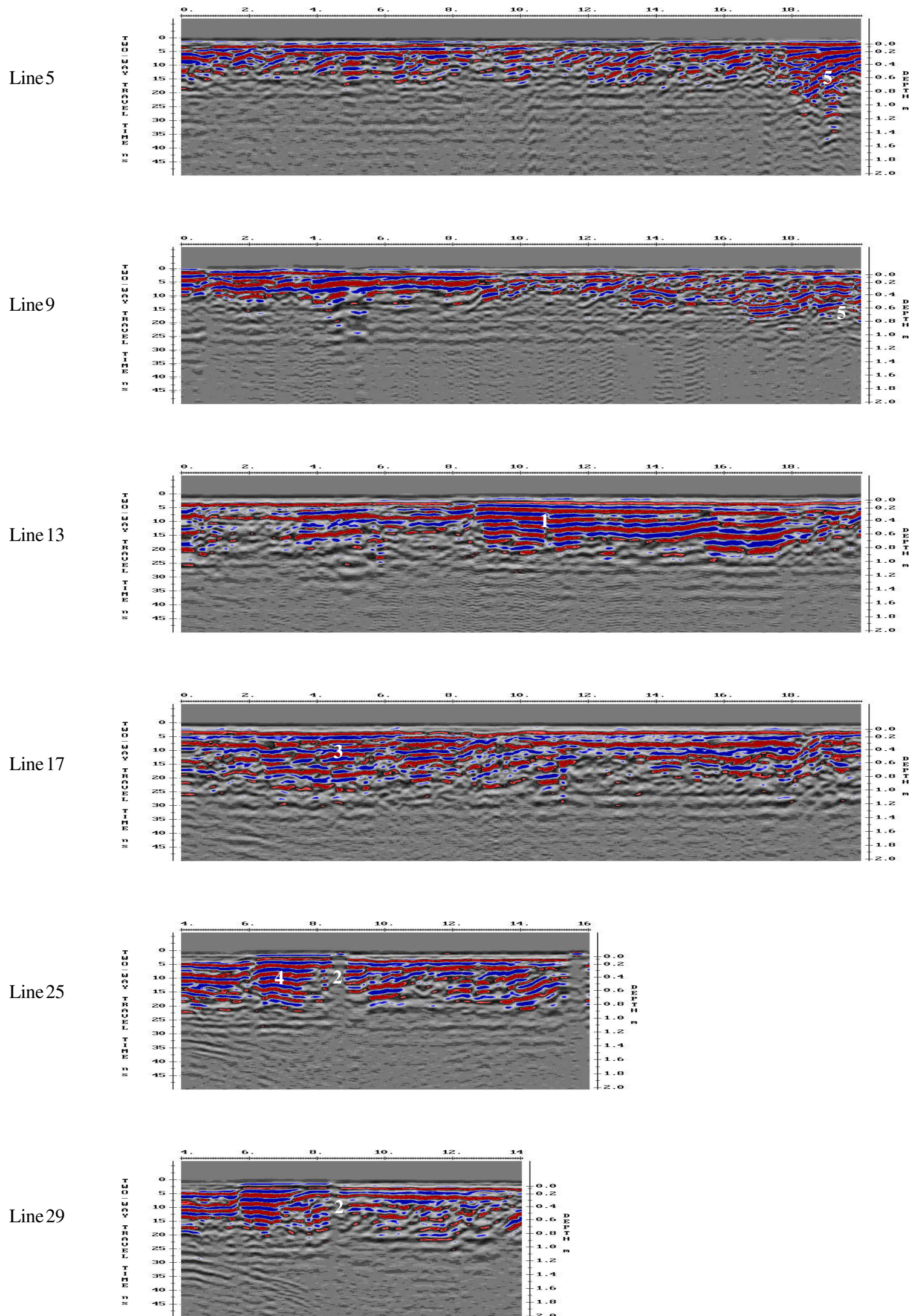
MERTON ABBEY MILLS
Site 1 - Area A

GPR Time Slice Maps
(No Background Removal)



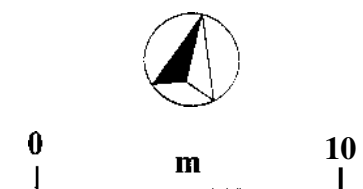
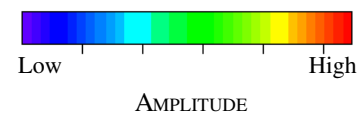
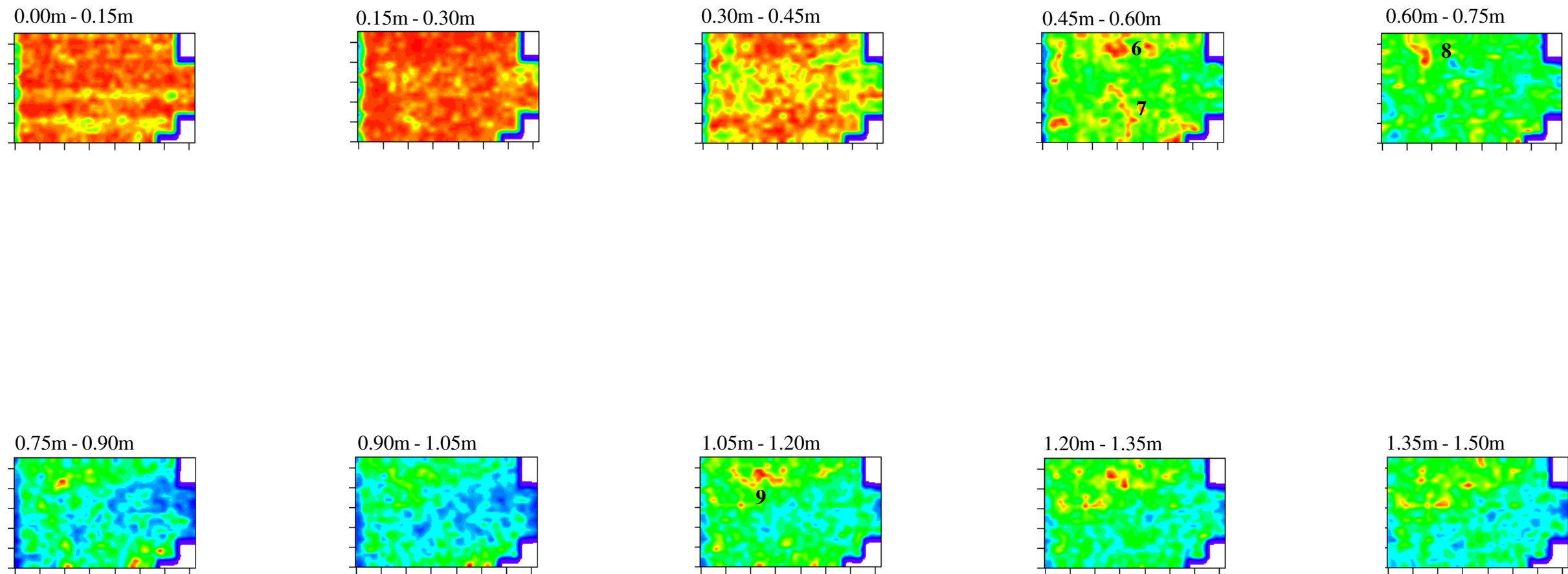
MERTON ABBEY MILL Site 1 - Area A

Example Radargrams



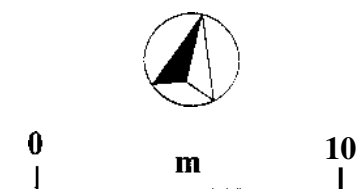
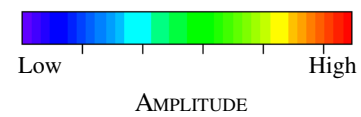
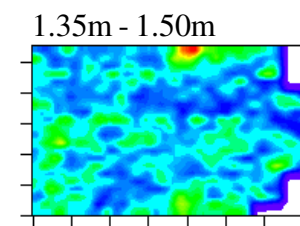
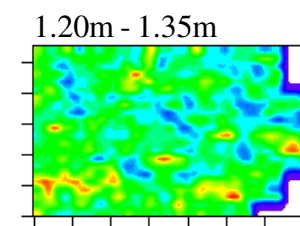
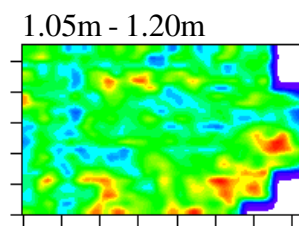
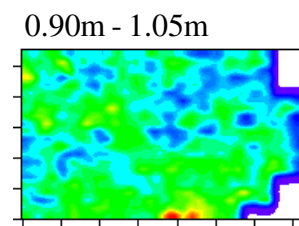
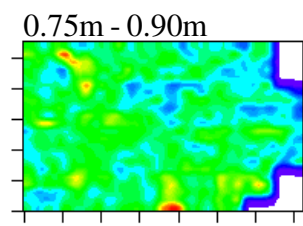
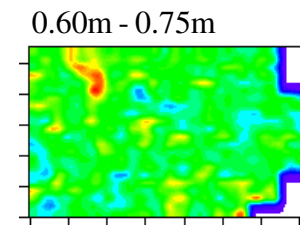
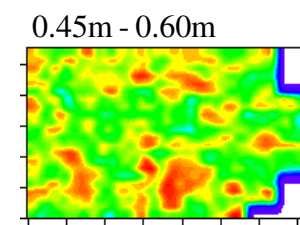
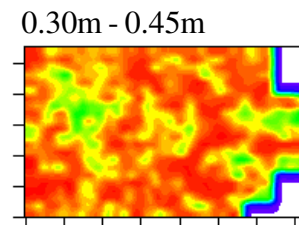
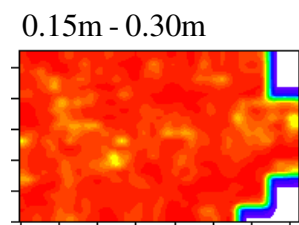
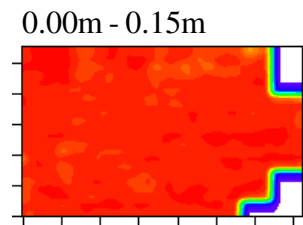
MERTON ABBEY MILLS
Site 1 - Area B

GPR Time Slice Maps
(With Background Removal)



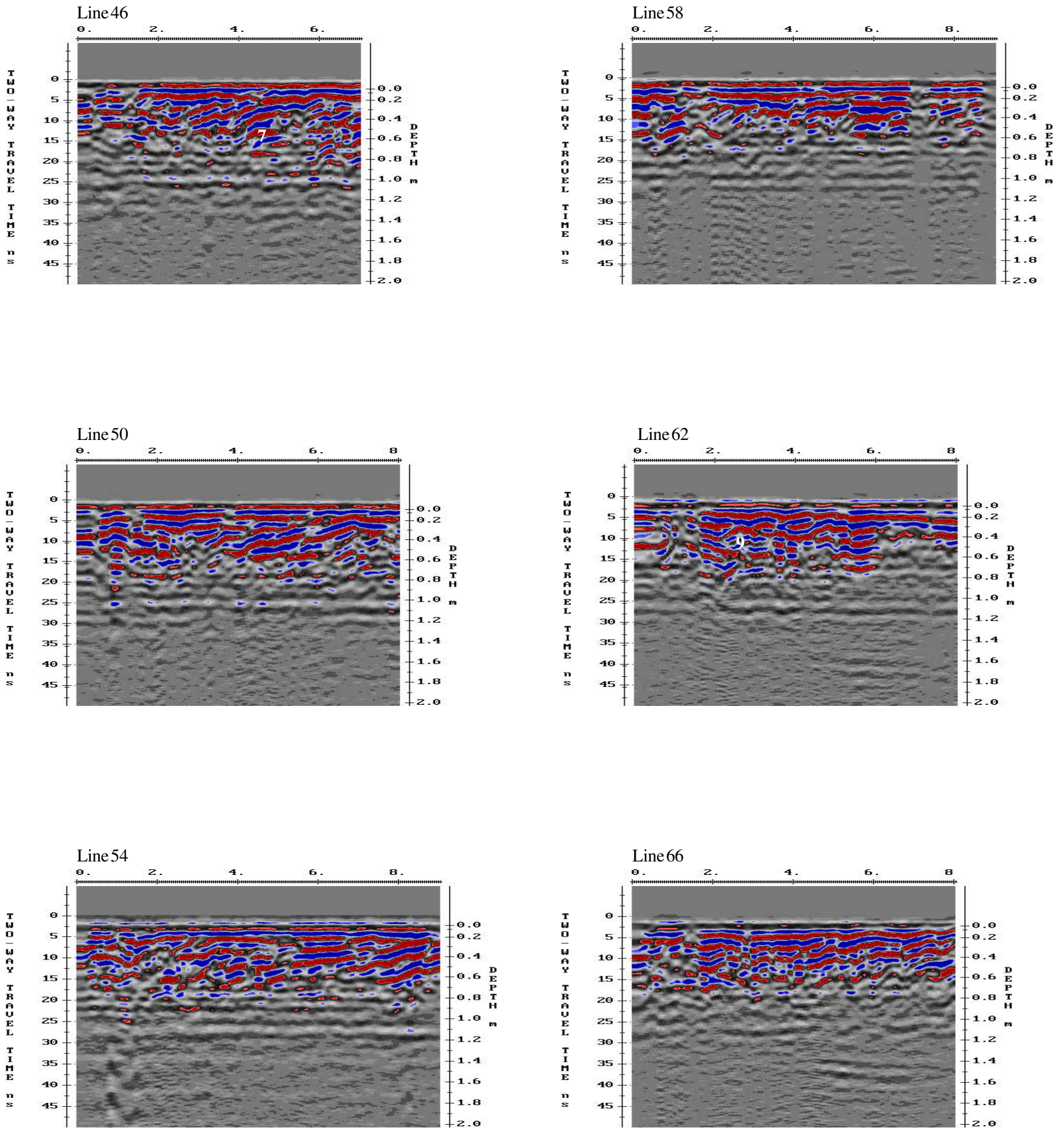
MERTON ABBEY MILLS
Site 1 - Area B

GPR Time Slice Maps
(No Background Removal)



MERTON ABBEY MILL Site 1 - Area B

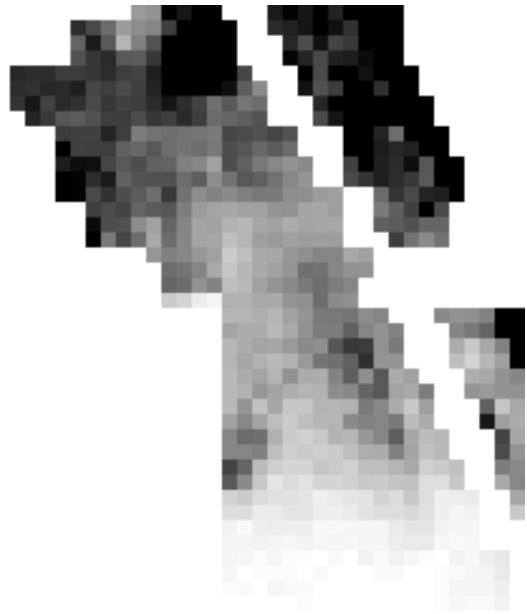
Example Radargrams



MERTON ABBEY MILL
Site 2
Resistance Data

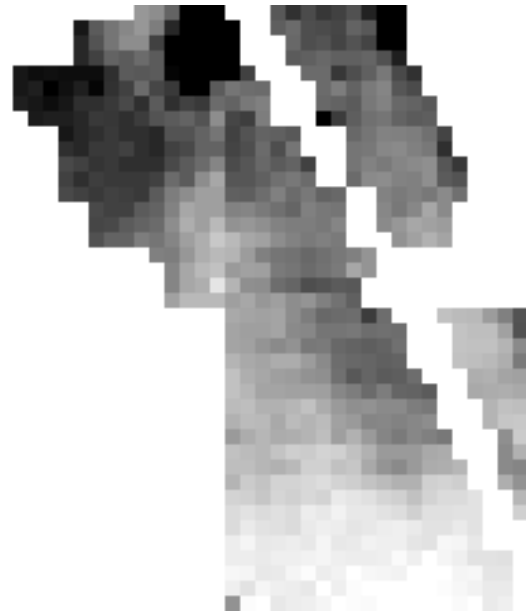
0.5m Data

Raw Data



1.0m Data

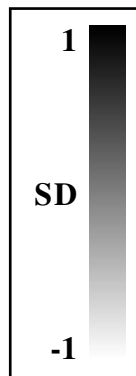
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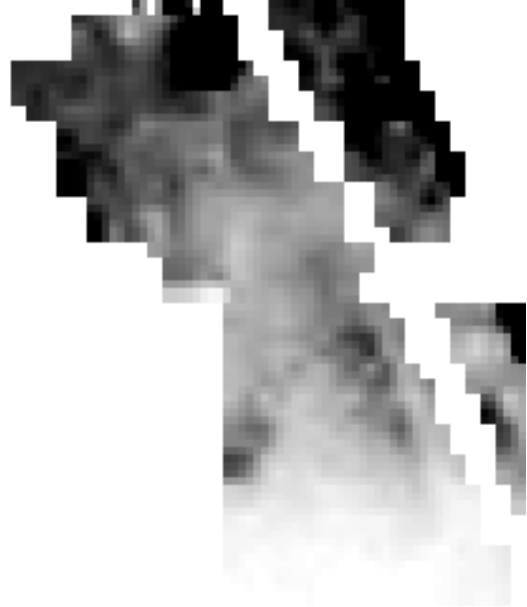
High Pass Filtered Data



High Pass Filtered Data



Interpolated Data



Interpolated Data

