


St John the Evangelist Church Survey



B 17124

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2021

Background and History

This geophysical survey was undertaken by Andrew Frost, principle of SEE Spatial & Geophysics, and part of Flinders University Archaeology Department. The survey took place over 4 field activities, spaced from 20th September 2020 until April 2021, with the initial survey as part of the adjacent Cemetery survey.

The goal of this survey was to locate any remnant foundations from the St John the Evangelist Church, which had previously stood on the corner of Tottenham Court Rd. and Leeds St., Port Elliot. The block that was said to have contained the church is 54-60 Tottenham Court Rd, and is largely vacant, containing a few well-established pine trees.

The ground surface is sparsely covered with small grasses. Scattered across the survey site is small scatters of rubble, assumed to be from the demolition of the church.



Figure 1: Examples of the scattered rubble.

The soil of the site is classified within the Dept. of Environment Water and Natural Resources State Land & Soil Mapping Program (Hall et al 2009) as comprising 35% hard sandy loam over red clay; 20% brown or grey clay and 45 % sandy loam over brown or dark clay.

The SA Register recorded the ceremonial laying of the cornerstone and consecration of the St John the Evangelist Church on the 14th December 1864. A bottle containing coins and a descriptive tablet was buried under the stone. Donations to help with the building costs were collected on the day, and a handsome sum of £86 was collected. The size of the church was given as 44 feet long and 24 feet wide (13.4 m x 7.3 m) (SA Register 1864). A convent was also at the same site from 1883 -1884. The Church was demolished in 1936.



Figure 2: St John the Evangelist Church. Left 1898 and right being demolished in 1936. Both photos courtesy State Library. Catalogue numbers B17124 and B9495.

Methods

The geophysical methods used within this survey are non-destructive and non-destructive. In this survey Ground Penetrating Radar (GPR) along with a Fluxgate Gradiometer were used.

Ground Penetrating Radar (GPR) is one of the most favored methods to map burial sites, as it can map both physical and chemical changes in the soil stratigraphy. The GPR uses electromagnetic radiation found in the microwave band (typically 10MHz to 2.6 GHz) to send pulses into the subsurface profile, these are reflected off sub-surface discontinuities, or changes in resistivity. The GPR unit comprises of both transmitter and receiver antennae. The returning pulses are measured in elapsed travel time.

This survey used a GSSI SIR 3000 GPR unit.

Fluxgate Gradiometers measure the subtle changes in the earth's magnetic values. These changes may be from metal objects either on the surface, or in the subsurface profile. Subsurface discontinuities could be from disturbed soil, or in this case, buried remnant building material.

This survey used Bartington Grad601 Single Axis Fluxgate Gradiometer.

Survey Design.

GPR

All GPR data was collected in grids, with these grids being various sizes. All GPR lines were at 0.5 m spacing. Three of these grids have been previously reported on.



Figure 3: The three GPR grids previously reported.

One further GPR grid was used to the north of these initial grids. This was placed to confirm the findings from the Gradiometer survey. All GPR lines were of west-east orientation, with 0.5 m spacing.



Figure 4: Location of the additional GPR grid, 'Church 4'.

Gradiometer

One large grid was used to collect the magnetic data. This grid was 30m x 30m, with data capture set at 2 lines per meter.



Figure 5: Location of the Gradiometer Grid.

Data Processing

GPR

The ground penetrating radar data was processed in 2D and 3D using the GPR Slice v7.0 data processing software. Both 2D and 3D data was subject to a standard process flow.

Fluxgate Gradiometer

The gradiometer magnetic data was processed by Snuffler, the grid processing software.

Data Analysis

GPR

The interpretation of the initial grids has been reported in a previous report. In summary, processing data from these grids in GPR Slice showed, what looked like to be subsurface foundations, of a size and orientation that could possibly have been the church.

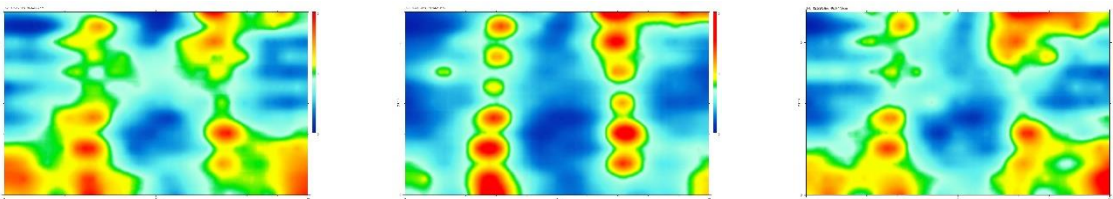


Figure 5: Depth slice of the Church GPR results. Left - 15.6-46.7 cm, centre - 31.1-62.3 cm and right - 46.3-77.5 cm.

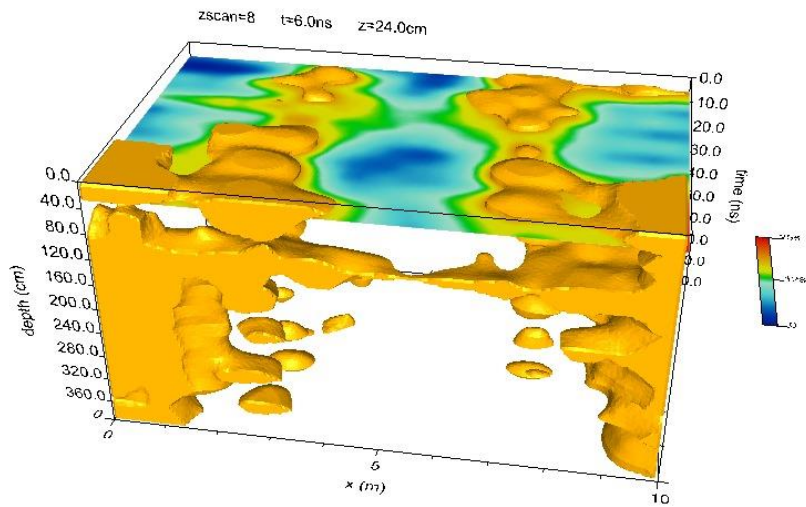


Figure 6: 3D render of Church picks from Grid 3.

The new GPR grid (Church 4) was also rendered in 3D, see below.

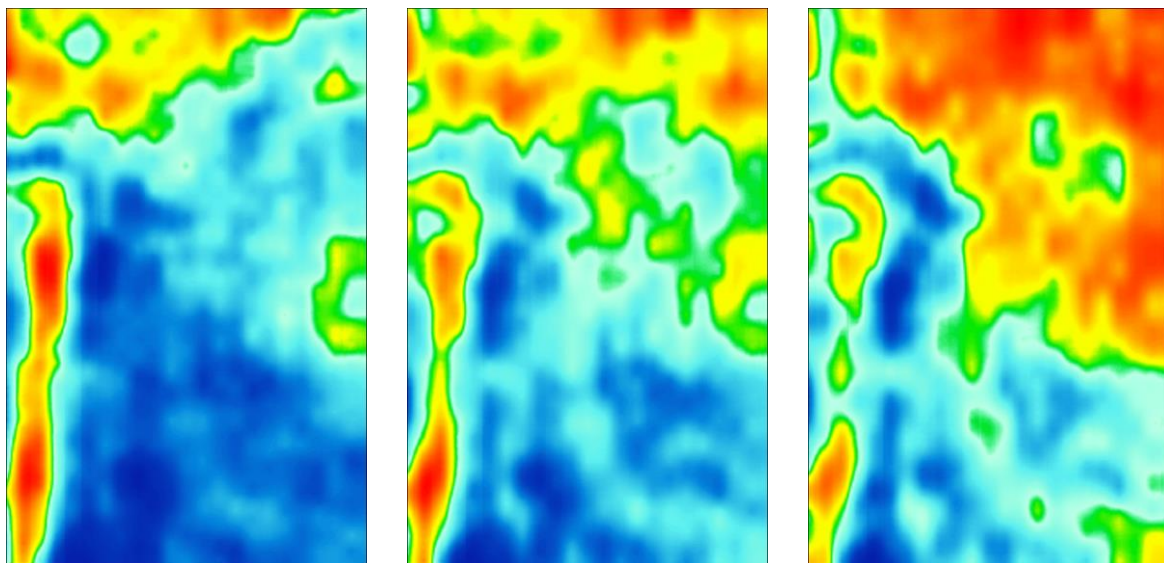


Figure 7: Depth slices, Church 4 grid. Left - 32.3 - 95.4 cm, centre - 63.7 - 127.4 cm and right - 95.9 - 159.6cm.

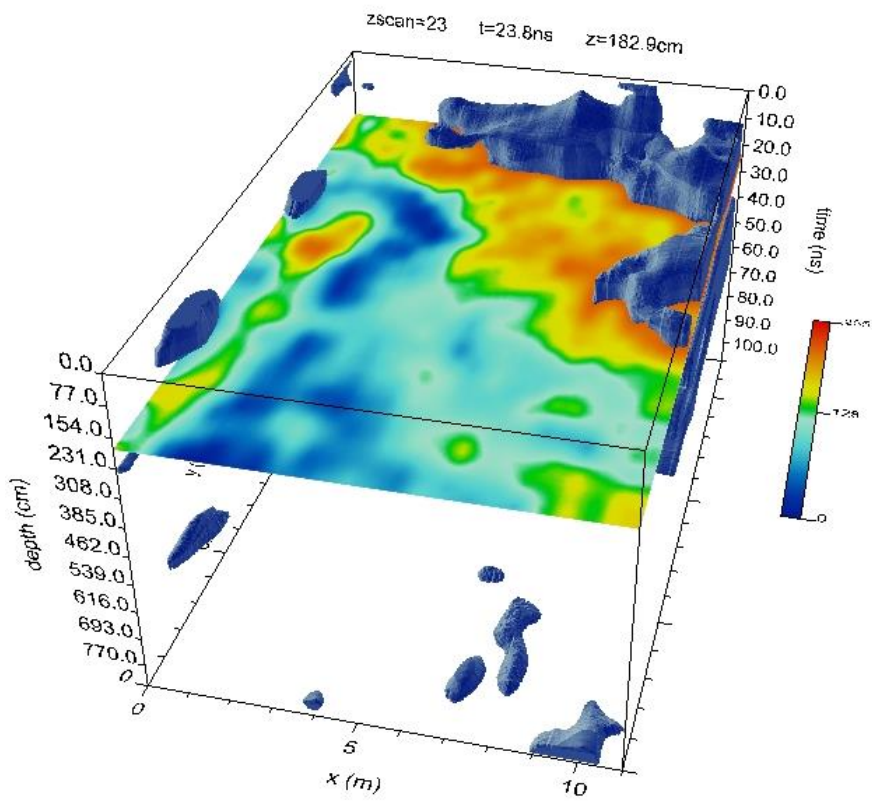


Figure 8: 3D render of Church 4 grid showing possible foundation remnants.

Fluxgate Gradiometer

The results from the magnetic survey show what could be the outline of the foundations of the church.



Figure 9: Gradiometer results showing location and orientation of subsurface anomalies, possibly the Church.

The subsurface anomalies that the gradiometer has picked up is approximately 13.5 m x 7.2 m, and it can be seen that the shape and orientation is confirmed by historic photos sourced from the State Library of South Australia.

Conclusions

The use of two geophysical methods in this survey has offered some surety in the interpretation of the data. The initial GPR survey of grids Church 3 did show some subsurface anomalies, that given the orientation and shape, could be argued to have been the remnants of the church. Further, subsequent, investigation of this area with the gradiometer failed to substantiate this. These subsurface anomalies could well be the remnants of a building, but not of the church.

Shifting the focus of investigation a few meters north has gained results that do strongly suggest that this is the location of the church. It can be seen in the gradiometer results, figure 9, that there are subsurface anomalies to the south-east of the main building, these are consistent with the results from the initial survey. Also of note, there is no sign of the convent, which in the 1898 photo, does seem to be quite adjacent to the church.