“The need for accurate information on buried utilities”

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Subject: A major risk to new Tram/Light Rail developments – The lack of accurate information on buried utilities

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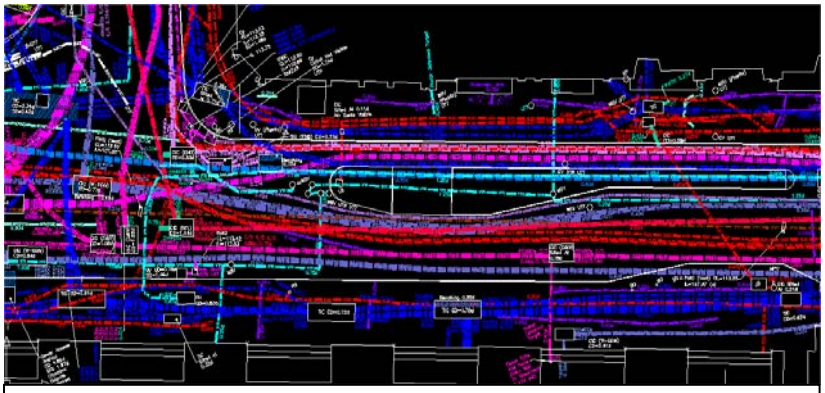
Executive Summary:

This document states the case for the need to fully understand what is hidden within the subsurface environment accurately. To date large schemes are designed and subsequently developed using utility company record drawings. These drawings are notoriously inaccurate and are therefore followed up with specific excavations in key areas that could adversely affect the project design. The result is an indicative view of the overall situation and some (If recorded correctly) ground truth information at the obvious positions where clashes between the design and existing utilities are expected.

The alternative of physically mapping the entire project area prior to starting the design works has recently become accepted as part of this process; however, the huge variance in costs and in the quality of results being returned has reduced faith in this approach. The simple truth is that if designers had accurate reliable information on what is beneath their site, then both the design and subsequent construction could remain significantly closer to initial budgets. In addition, zero harm Health and Safety targets could be more readily realised and disruption to local communities kept to an absolute minimum. Our mission now is to set standards to ensure that one utility survey will be as reliable as the next, to allow the procurers of such services to know that the product they are buying, is exactly what they need.



What to expect - Ropemaker Street, City of London

Background:

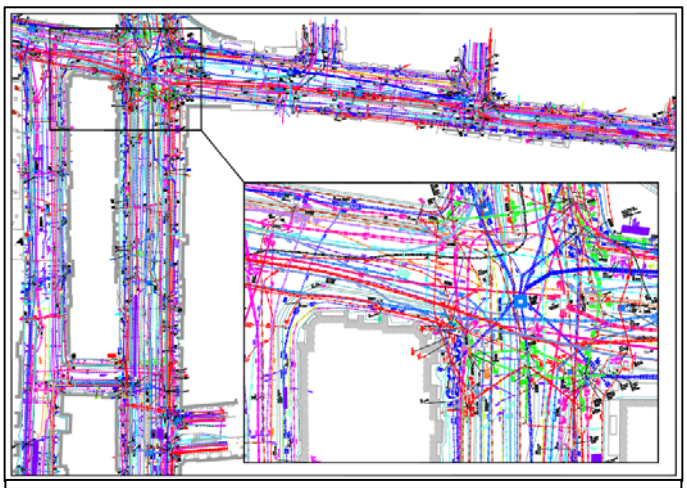
Originally a Land and Building Surveyor I began working with Ground Penetrating Radar in 1993. My focus at the time was to develop a working strategy for the technology, to design a system that could record data in a site environment and result in an accurate scalable plan that could be easily understood by designers and excavation teams alike. This position resulted in the overseeing of a technology

transfer of the system into a group of 12 New York gas companies who had funded the development.

In 1999 I founded Subtechnics Limited with the main advantage of being free to mix technologies from different manufacturers to enhance the effectiveness of the services offered. Software development further enhanced this capability and eventually led to Subtechnics Limited becoming the most trusted supplier of accurate utility maps in the industry.

In 2004 Subtechnics carried out a number of test sites for the Crossrail project, which proved the reliability of the techniques being used. This led to a 3 year term contract which is now in its third extension.

I am on the committee of EuroGPR a European association for users, manufacturers, Academics and indeed procurers of radar related services and products. Indeed, the association is now gaining momentum within the European field and the next AGM is on Monday at the European High Commission in Brussels. EuroGPR is responsible for making the technology legal for use in the UK and in partnership with OFCOM has designed and implemented a licensing scheme.



Crossrail Project – Moorgate, City of London

My Co-Director Graham Mills is the chair of the technical committee for The Survey Association, which is about to launch the UK Utility Mapping Standards at the end of November. These standards are to be adopted by the RICS and the ICES alike. I have been greatly involved in the creation and fine tuning of these standards and believe that they will go some way to relieving the problems our industry currently faces.

As an invited member of the Crossrail Contractors Health and Safety forum, I am also now a member of a Crossrail sub-committee tasked with reducing potential cable strikes across the £15.9 billion project. In fact one of the first realisations resulting from this group is that the Crossrail drawing standards are good for the design teams but are no good for the excavation teams!

Why the need for standards?

Since founding Subtechnics in 1999 the popularity of subsurface utility mapping has spread throughout the design and construction communities. The introduction of the Corporate Manslaughter Bill on top of companies experiencing spiralling costs associated with utility strikes has further fuelled demand for accurate mapping services. Equipment manufacturers, keen to secure new business have flooded the market with entry level radar systems and many new companies have been formed, within the industry to cope with the ever increasing demand. Unfortunately, the fast market expansion and the complex technical nature of the systems employed has led to a skill gap in within the service providing arena.

When an organisation places a tender notice for a large utility mapping contract, they invariably find themselves with an array of cost proposals that can range from

hundreds GBP to tens of thousands GBP for the same project. All will be titled “Radar Utility Survey” and all will describe a similar approach. Indeed, some of the more reputable companies reduce the quality of what they do simply to remain competitive with the less able companies. After all, it can be years after a survey is completed that the construction phase starts and the results revealed to be no better than the utility company record drawings.

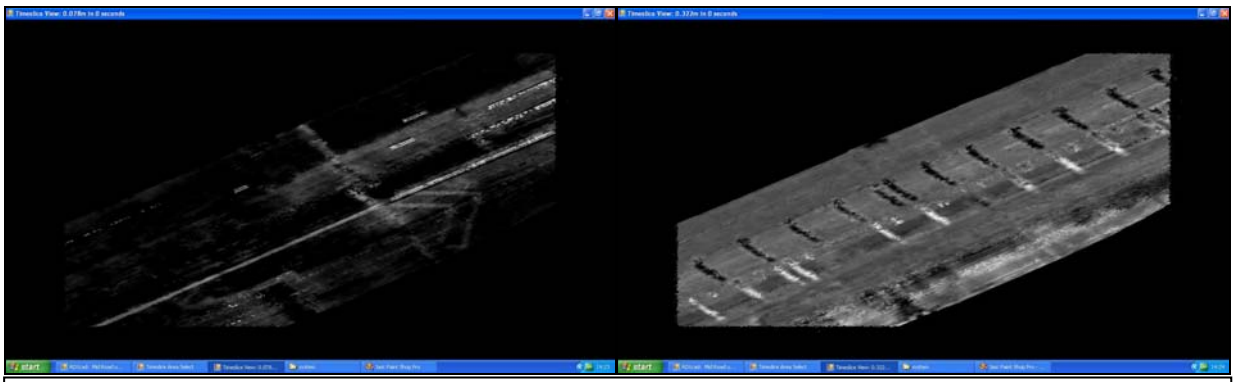
In an effort to combat this increasingly common phenomenon, working with the TSA and Euro GPR the establishment of a set of Standards is of paramount importance. Once issued, these standards will include procurement guidelines and indeed, guides for the practitioner as well.

Future Innovations

Another subject that deters the use of quality utility mapping services is the overall cost of doing the job properly. Procurers simply cannot see that spending ten thousand pounds on a survey may prevent a fibre optic cable strike that could results multi-million GBP claims. To cover every square meter of a development site with an orthogonal grid of radar measurements is extremely time consuming. Then each individual measurement has to be analysed before its contents can be added to a survey drawing. Yet this is the single most reliable method of deployment possible, with the closer the spacing between measurements directly affecting the reliability of the final result.

New Radar Solution

Knowing this to be an issue, I have been working on a solution that allows a grid of radar measurements to be recorded at a spacing of six centimetres in both directions while driving along a live road. Although only just coming to market, the resolution, speed of survey and ease of deployment will allow a very speedy assessment of a proposed tram route to be undertaken. The results rely less on interpretation as the information is presented as plan view images. This is a tool that will greatly enhance the information that can be provided to designers and subsequently contractors whilst reducing the costs of acquiring the data.



Imaged results from the New Radar Solution

Recommendations

- More focus is given to the procurement and specification of utility mapping services at the outset of a proposed tram/light rail project
- Received tenders are scrutinised for content and caveats
- The new industry standards are included in any tender requests
- Service providers are monitored and their results partially checked for accuracy
- Any obvious deviations from the required specification is reported to EuroGPR and the TSA so that malpractice can be reduced within the industry
- Training is given to those that use the information on exactly how it is acquired; resulting in a better understanding of what can and what cannot be achieved