
UNDERGROUND SERVICES DETECTION AND DATA

ISSUES PAPER

AIM

To examine issues facing the Surveying and Spatial Information industry relating to the accurate location and detection of underground utility services.

BACKGROUND

At the July meeting of the Surveying and Mapping Industry Council (SMIC) there was a lengthy discussion surrounding the problems associated with the accurate and safe on-site location of utility services. These problems were in addition to protocols already in place to ensure that all the relevant information was available on site from organisations like Dial Before You Dig.

A sub-committee was formed to prepare a discussion paper leading to recommendations to the Utility Authorities and/or Government to improve the quality of data and safe on-site excavation safety.

Most, if not all, survey and spatial science professionals are now well aware of their obligations under the Occupational Health and Safety legislation to ensure a safe work place and the need to utilise organisations like Dial Before You Dig to improve safety and minimise damage to services.

One of SMIC's constituent bodies, the Survey and Mapping Managers Forum (SMMF), has produced some documentation to assist practitioners when locating and placing survey marks that highlight precautions that can be taken. A number of organisations have standards/documentation to deal with excavation of underground services, these include but not limited too (in NSW) Energy Australia, Integral Energy, Sydney Water, Hunter Water, Tesltra, Powertel, AGL/Agility, RTA, Rail Infrastructure Corporation.

However, the majority of the above mentioned documents only relate to safe excavation where the records are inaccurate or unreliable or there is difficulty in detecting the service. In particular, buried services that are within plastic or other non metallic material, laid without trace wires, have, from industry feedback, been to most difficult to locate.

SMIC is of the view that if the services were more accurately defined there would be a significant reduction in risk and costs associated with excavation. This is demonstrated by consideration of costs for surface reinstatement, time lost in locating cables, costs of excavation, repairs, litigation, and most importantly injuries or death resulting from excavation.

Therefore there are two main aspects to the discussion

1. The accurate location of the services when they are installed or initially mapped, both in public and private land
2. The detection of the services when excavation is required

ACCURATE LOCATION OF SERVICES

SMIC is well aware that there are millions of utility services already in the ground for which there are scant or inaccurate records.

The past practice of digitisation of existing hard copy plans has served the industry well in that interested parties are at least aware of their existence and can take necessary precautions to minimise risk in excavation.

The rapid advancement of GPS and handheld technology gives the opportunity to improve the quality of data at the initial installation and collection stage (we note that this GPS location will not always be possible in heavily built up areas)

The issues that need to be considered are

- Mandatory data accuracy standards and datum for new works
- Work as executed plan lodgement
- Amendment of existing records
- Common cadastre and street addressing
- Data sharing arrangements between organisations

The Geospatial Information and Technology Association (GITA) prepared the “Utility Industry Position Paper #1” in December 2000 titled “Geospatial Information” that considered some of the data sharing and cadastre issues.

There is little value, and there would undoubtedly be little support for the recapture of vast amounts of existing data to improve the accuracy of service locations (please note that there is a project of this sort underway in the CBD by Energy Australia as a result of a management decision due to the unacceptable risks, costs and potential liabilities).

However, there is no reason that utility organisations could not require

- Data on new services to be collected to standard accuracy and datum using GPS or other technology
- Work as executed plans to be lodged with new works
- That when any underground service is exposed during excavation, the position is recorded to the required standards, by approved persons and such information be supplied to the Utility Authority who will update their records

This would help enormously in newly developed areas by providing standard data to stakeholders and reducing the risk and costs in redefining where services are located.

DETECTION OF SERVICES

Utility services come in many varieties of sizes, shapes and materials. The use of electronic equipment to detect the services can require a number of different scanners, without ever guaranteeing that it will be effective. In some geological areas detection of services is extremely difficult to the point of impossible.

The common sense solution would seem to be to require mandatory installation of trace wires along all non metallic service conduits that could be readily detected using a generic detector.

We are informed that there are some technical difficulties associated with the achievement of a generic detector solution. However, the possibility should not be dismissed as technology is rapidly outstripping our expectations.

A further requirement could be the mandatory installation of marker warning tape or paver blocks above the services as used by Energy Australia.

Again there is little point in asking Utility Authorities to revisit existing sites. But there is an argument that a consistent approach could be adopted for new works.

There are two immediately identifiable areas that would benefit from this requirement. Firstly, the prevention of injuries to immediate construction workers, and any other person in the vicinity, sometimes these injuries amount to significant financial costs, both in the short and long term. Secondly the enormous cost to the community (business and residential) at large when services are cut due to damaged conduits.

There will be a significant cost involved in the introduction of such a requirement but there is an argument to suggest that the reduction in risk to cutting services and the associated costs of replacement could offset. We have not conducted any cost benefit analysis of the implications but suggest that this should be completed in the future

OPTIONS

The implementation of any changes to the way in which Utility Authorities locate their services and/or change the way they lay their services could only be achieved in two ways

1. Statutory obligations by changes to the relevant governing legislation for each utility
2. Agreement within the Utility industry to implement, the representative body being GITA

These requirements must also be applied to contractors who make connections to the utility supply and install services in private land.

Our first option should be to ask GITA to raise these issues within the industry with the view to adoption of a set of standards across the Utility industry, if agreement can not be reached we may need to lobby Government to initiate a review of legislation.

A possible outcome of our first option could be:

- *GITA initiating and developing a suite of standards which are deemed to be industry best practice which could then be submitted to BOSSI who can in turn put them to the Minister for Emergency Services and Lands (Tony Kelly) to put to Cabinet for whole of Government adoption. This would embed the standards across all State Government Departments, Agencies, Corporations and Local Government.*
- *If NSW Government adopts these standards then pressure can also be brought to bear on those Utilities that operate under Federal legislation like Telstra, Optus etc.*

RECOMMENDATION

That SMIC writes to GITA requesting that they initiate a discussion within the industry to

- Determine common accuracy standards for data capture for new or replaced services, and by whom these data captures are made
- Require work as executed plans to be lodged with new or replaced works
- Include a uniform material in new or replaced conduits and structures containing services that could be readily detected using a generic detector

SMIC Service Location sub-committee