

TIP sheet

Underground utilities

T011 – MAY 2007



Definition

All buried services at a work site including telecommunication services, electricity, gas, water and sewerage.

Minimum requirements

Managers and supervisors must implement measures to control and/or minimise the health and safety risks associated with underground utilities.

All RTA worksites shall ensure that before power tools or mechanical excavation plant are used in the nearby vicinity:

- An 'excavation permit' has been established to guide the risk management framework of working around utilities.
- Where there is doubt, confirm position of utilities with utility owners, i.e. utilise ['Dial Before You Dig'](#) services (1100).
- All underground utilities in the work area are identified, located, visually verified and documented on the site plan.
- Written Safe Work Method Statements (SWMS) are developed for all interactive tasks in the vicinity of underground utilities.
- All required warning signs, devices and emergency procedures are in place.
- All employees and contractors who may work in the vicinity are trained in the nature of the hazards involved, the means adopted

to control exposure and emergency procedures in place.

- All underground utilities identified that are not on the plans should be made known to those with the source of the plans.
- All temporary devices and warnings shall be removed, and utility services deactivated, de-energised or disconnected shall be reinstated on completion of the work.

Hazards

The following work activities commonly involve the potential to damage underground utilities:

- Excavation
- Auguring
- Drilling

Risk assessment

A Risk Assessment and SWMS must be completed by a qualified, technically competent person for any activity involving interaction with underground utilities and must be specific to the service(s) present.

The Risk Assessment of underground utilities shall comply with the RTA OHS Risk Management Procedure.

The purpose of a Risk Assessment is to determine and implement appropriate control measures, induction and training, monitoring and workplace surveillance.

Inaccuracies can and do occur, both on plans and in the ground. If in doubt, check with the asset owner. Never guess or assume!

Utilities and asset owner's plans show only the presence of some cables, pipes and plant. They only show their position relative to road boundaries, property fences etc. at the time of installation and the utilities do not warrant or hold out that such plans are accurate thereafter due to changes that may occur over time.

Do Not Assume Depth or Alignment of cables or pipes as these vary significantly. For example, road and building alignments and levels may change.

Risk control

The most effective method to control the risk is to eliminate the need to interact with underground utilities. If this is not possible, then reduce the risk by working through the following suggested controls (using multiple controls where necessary).

Training

All persons working in the vicinity of underground utilities shall be trained in the management of risks from underground utilities in the workplace. All staff working on site shall have site specific induction training on underground utilities and in particular:

- The potential for damaging energy transfer.
- Control mechanisms utilised.
- Associated emergency procedures.
- Refresher training every 2 years.

Cable/Pipe identification

The best way to avoid incident or injury is to identify the position of underground services and/or have them de-activated or disconnected before starting work. Identify them by using:

The Site Utility Plan

An electronic pipe or cable locator should be used to more accurately identify the location of the underground asset – as utility owner plans will not provide exact locations.

Underground Utility Indicators

- Posts supporting electrically powered services/equipment.
- Alignment markers.
- Valve pits.
- Pit covers.
- Tracer-devices, including buried marker -tapes or cable protectors.

Once identified different coloured conduits (according to the nature of the asset) may be temporarily inserted into the pot-hole directly onto the underground asset. These conduits, when back filled extend approximately 1-1.5 metres above the ground and are plugged on top to prevent dirt and debris entering the conduit. These above ground locators enable easy visual identification of the path of known underground utilities and when a measuring tape was inserted into the conduit, provided the exact depth of the asset.

Cable and pipe locating devices

Such plant includes electronic detectors that are designed to locate underground utilities.

Once identified using such electronic device, care should be taken to mark the location of the underground asset on the ground's surface.

Safe digging practices

Clearly define and mark areas where work can and cannot be undertaken using safe digging practices with insulated hand tools.

Pot-holing should be undertaken along the length of the proposed excavation to identify the path of underground utilities and their depth. Careful digging (pot-holing) is the only sure way to identify the depth and alignment of underground pipes and cables.

Pot-holing must be undertaken with reference to plans and other information provided by pipe and cable owners.

The amount of pot-holing should be determined with reference to the risk assessment for the site.

Safety Observers

Excavation work around underground utilities should only be undertaken with the assistance of a competent safety observer.

The Safety Observer/s should be given sufficient control of the activity to call for a cessation of work in the event of system failure or observation of unsafe practice which may give rise to an inadvertent contact with an underground or overhead asset. When excavating near or adjacent to underground utilities it is important to be aware of overhead hazards such as overhead powerlines.

Risk assessment may dictate a requirement for more than one safety observer for such activity.

Air and water lancing

Air/water lancing techniques may be used in some circumstances, but the advantage of these needs to be assessed against any inherent safety and environmental risks.

E.g. dust generation, contaminated water runoff and possible damage to underground utilities.

Safe exploratory boring practices

Before beginning pile driving work, post installation or other boring operations on sites where underground services are likely but not positively identified, install small exploratory pilot holes first.

Global Positioning System (GPS)

GPS technology provides an excellent opportunity to plot the location of underground utilities and maintain that information for the duration of the project. This is especially important in maintenance and long term projects.

GPS locations, when captured, should be noted on relevant plans. This information should also be provided to asset owners for any as built/modified infrastructure or previously unidentified underground utilities.

Ground Penetrating Radar (GPR)

GPR is emerging within the civil industry as an alternate tool for identifying underground utilities and mapping utilities on a wider scale.

GPR is a non destructive and non evasive technique for rapidly imaging the shallow surface (up to 10m) and produces high resolution colour section in real time. Parallel images can be used to create a 3D image.

The depth of image can vary on soil density and moisture content.

Review

Risk Assessments, SWMS, and work procedures must be reviewed & revised when there is evidence that:

- The original assessment is no longer valid or older than 3 years or,
- Exposure results from injury/illness or
- A significant change is proposed at the place of work, or in work practices or procedures to which the assessment relates.

In the event of a strike/emergency

An emergency response plan should be prepared in consultation with the workers at the workplace and emergency service agencies where appropriate.

Emergency stop controls shall be readily accessible and signposted and all staff should be aware of emergency shut down procedures associated with the equipment in question.

Where possible:

- Evacuate all personnel from the vicinity.
- Ensure that Emergency Services are immediately notified where required.

Gas pipe – **Do Not Bend Over A PVC Gas Pipe To Restrict Flow** - the contents of the pipe may create a spark.

References

[OHS Act](#) 2000 & [OHS Regulation](#) 2001 Part 7.7 & Chapter 8.

[RTA OHS Policy 2.0](#) – OHS Risk Assessment

[RTA OHS Policy 2.25](#) – Work In the Vicinity of Aboveground, Underground and Underground Utilities

[RTA OHS Policy 4.0](#) – Personal Protective Equipment

