Procedure

Excavation, Trenching and Penetrations

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9	Amended Version	Manager Health, Safety & Wellbeing	See supporting info in Rex CD	General Manager - People, Culture & Safety	See supporting info in Rex CD	30/03/2022

Contents

1 Purpose

The purpose of this document is to define Seqwater's expectations for excavation and trenching activities and for work activities where penetrations are made through walls, ceilings or floors at Seqwater workplaces.

2 Scope

This Procedure applies to all workers, contractors and consultants working for or on behalf of Seqwater, unless otherwise stated.

3 Critical Controls

Critical Controls For Excavation		
#	**Critical Controls**	**Objective**
1	Emergency Response.	Emergency Response To mitigate the impact on human life of exposure to unsafe conditions during excavation and trenching works.
2	Positively identify all services within planned excavation area.	To prevent mechanical disturbance of known and unknown underground services.
3	Isolate all identified HV electrical, hazardous substances and high-pressure services with potential to encroach within 5m of the planned excavation.	To de-energise identified HV electrical, hazardous substance and high-pressure services within the planned excavation.
4	Minimum separation distances are maintained from all underground services.	To prevent contact with known services within the planned excavation.
5	Excavations >1.5m are benched, battered, shored or verified stable.	To prevent excavation collapse.
6	Heavy loads and machinery are stable and positioned outside the 'zone of influence' of the excavation.	To prevent loads or machines falling into an excavation.
7	No persons "In the firing line" of mobile plant.	To prevent mobile plant from striking a person.
8	Barricading of excavations that create a fall risk.	To prevent a person from falling into an open excavation.

4 Procedure

4.1 Excavation and trenching

The following rules must be applied by all workers undertaking tasks involving excavation and trenching at Seqwater workplaces:

- a SWMS must be developed and implemented for any work activity involving excavation and trenching.
- an Excavation and Trenching Permit (FRM-00413) must be completed:

- before commencing any mechanical excavation on a brownfield site; or
- before commencing excavation/trenching to a depth of 300mm or more on any site (greenfield or brownfield); or
- before a worker can enter any excavation or trench with a depth of 1.5 meters or more, or where there is a risk of engulfment due to poor ground conditions.

- where practicable, vacuum excavation is the preferred method for excavating or trenching on brownfield sites (pressure setting must not exceed 2000 psi).

In accordance with section 4.1.4, the following steps must be taken to positively identify underground services prior to conducting any excavation or trenching on a brownfield site:

- Review of all relevant site plans and Dial Before You Dig (DBYD) information.
- Physical inspection of the planned excavation site and surrounding areas to assess the working environment and identify any other visual indicators of underground services. Where practicable persons with local knowledge of underground services at the site should be consulted as part of this process.

Unless the entire planned excavation will be completed by non-destructive methods (e.g. vacuum excavation or hand digging), all buried services must be located and marked as far as practicable in line with the following requirements[1]:

- known services with potential to encroach within minimum **5m** of the planned excavation must be positively identified. Positive identification requires the use of non-destructive methods to confirm the location, depth and direction of buried services while they remain within 5 m of the planned excavation. Examples of non-destructive methods include vacuum excavation (max pressure of 2000 psi), ground penetrating radar/technology, insulated prodder, cable locators or hand digging;
- any service that encroaches within **300 mm** of the planned excavation must be visually verified by potholing (vacuum excavation or hand digging).
- for Seqwater high risk sites[2], the following additional precautions must be applied before commencing mechanical excavation (these precautions apply irrespective of whether plans/drawings have identified buried services near the planned excavation and are necessary to safeguard against the potential risk of inaccurate or incomplete plans/drawings).
  - precautionary slit trench around the perimeter of the planned excavation using non-destructive methods (recommended where practicable giving due regard to the scale of the planned excavation); **and**
  - precautionary investigation using ground penetrating radar/technology across the planned excavation.

[1] Additional service location requirements may be prescribed by asset owners (e.g. APA, Energex/Ergon Energy) when issuing DBYD plans or approving work near their high-risk assets.

[2] High risk sites include Water Treatment Plants (WTPs) and other Seqwater sites/areas where the type or complexity of underground services presents a serious risk to safety or supply of essential services.

Refer section 4.1.4for specific detail on service location requirements.

- Where practicable, buried services near the planned excavation should be isolated prior to commencing excavation or trenching.
- A dedicated spotter must be used when performing mechanical excavation on a brownfield site.
- The following additional controls must be applied when performing mechanical excavation near buried services:

a. A minimum separation distance of **300 mm** must be maintained between any live buried service and mechanical digging components such as buckets, augers or similar attachments (non-destructive methods

such as vacuum excavation or hand digging must be used where it is necessary to excavate within the minimum separation distance) [1, 2]

[1] A greater separation distance and additional controls may be prescribed by asset owners (e.g. APA, Energex / Ergon Energy) when issuing DBYD plans or approving work near their high-risk assets.

[2] Exceptions may apply where it is absolutely necessary to use powered equipment to remove concrete or bitumen to facilitate non-destructive potholing/excavation. In such cases the depth of the service must be confirmed as far as practicable prior to starting and robust controls implemented to prevent damage or contact with the service.

b. As far as practicable, the type of bucket or mechanical digging attachment should be selected to minimise potential damage in the event of accidental contact with a live buried service (e.g. use of toothless excavator buckets).

c. Ground material must only be removed in shallow layers at a time (recommended maximum 200mm of ground material removed at a time with ground probing by a spotter performed after each pass using an insulated tool).

- Heavy loads must not be positioned in the zone of influence of an excavation or trench (refer section 4.3.8 for further detail).
- Controls must be in place to prevent persons or objects falling into open excavations and trenches (this includes controls to prevent unauthorised access or inadvertent entry).
- No person shall be present in an excavation or trench where there is a risk of harm from plant falling into the occupied area.
- Persons must not enter an excavation or trench with a depth of 1.5 metres or more, or where there is a risk of engulfment due to poor ground conditions, unless one or more of the following controls are implemented to prevent ground collapse:

a. benching (maximum bench height must not exceed 1.5m unless designed and certified in writing by a RPEQ engineer).

b. battering (angle of repose must not exceed 45 degrees unless designed and certified in writing by a RPEQ engineer).

c. shoring, trench box or other ground support system

d. written assessment from a RPEQ engineer warranting that there is no risk of collapse.

- A High Risk Work Rescue Plan (TEM-00027) must be developed and tested before a worker can enter an excavation or trench with a depth of 1.5 meters or more, or in other circumstances where there is a risk of engulfment due to poor ground conditions.
- A safe atmosphere must be maintained within any occupied excavation or trench. Where gas monitoring or risk assessment outcomes indicate there is a risk of an unsafe atmosphere, the occupied excavation/trench must be treated as confined space and controls implemented in accordance with the Confined Space Management Procedure (PRO-00443).
- A RPEQ engineer may need to be consulted during the planning phase to determine specific risk control methods. Specifically, structural and geotechnical engineering advice must be sought for the following situations:

a. when the depth of the excavation or trench is greater than three metres.

b. where the excavation is close to structures or buildings and the excavation may lead to load bearing issues.

c. where poor soil conditions warrant specialist advice to assess ground stability and determine safe work methods (e.g. this may apply to excavations in saturated or sandy soil or where the ground has been previously excavated).

4.1.1 Driving objects into the ground

The following rules must be applied by all workers undertaking work activities where objects are driven into the ground at Seqwater workplaces:

- a SWMS must be completed for any work activity where an object is being driven into the ground
- an FRM-00413 : Corporate Safety - Excavation and Trenching Permit Form required for all work activities where an object is being driven into the ground at a brownfield site to a depth of 300mm or more
- in accordance with section 4.3.2, the following steps must be taken to positively identify underground services prior to driving objects into the ground on a brownfield site to a depth of 300 mm or more [1]:
- Review of all relevant site plans and Dial Before You Dig (DBYD) information.
- Physical inspection of the planned worksite and surrounding areas to assess the working environment and identify any other visual indicators of underground services. Where practicable persons with local knowledge of underground services at the site should be consulted as part of the inspection process.
- Positive identification of known services with potential to encroach within minimum **5 m** of the planned area of ground penetration. Positive identification includes the use of non-destructive methods to confirm the location, depth and direction of buried services. Such methods may include the use of vacuum excavation, ground penetrating radar/technology, insulated prodder, cable locators or hand digging.
- Mandatory potholing (visual verification using vacuum excavation or hand digging) of any service that encroaches within **300 mm** of the planned area of ground penetration.
- For Seqwater high risk sites[2], one or more of the following additional precautions must be applied as far as practicable before driving an object into the ground to a depth of 300mm or more (these precautions apply irrespective of whether plans/drawings have identified buried services near the planned area of ground penetration and are necessary to safeguard against the potential risk of inaccurate or incomplete plans/drawings):
  - precautionary slit trench around the perimeter of the planned area of ground penetration using non-destructive methods; and/or
  - precautionary investigation using ground penetrating radar/technology across the planned area of ground penetration.

  [1] Additional service location requirements may be prescribed by asset owners (e.g. APA, Energex/Ergon Energy) when issuing DBYD plans or approving work near their high-risk assets.

  [2] High risk sites include Water Treatment Plants (WTPs) and other Seqwater sites/areas where the type or complexity of underground services presents a serious risk to safety or supply of essential services.

Refer section 4.3.2 for detailed service location specifications

- A minimum separation distance of **300 mm** must be maintained between any object driven into the ground and buried service(s) [1]

  [1] A greater separation distance and additional controls may be prescribed by asset owners (e.g. APA, Energex / Ergon Energy) when issuing DBYD plans or approving work near their high-risk assets.

4.1.2 Penetrations

The following rules must be applied by all workers undertaking work activities where penetrations are made through walls, ceilings or floors at Seqwater workplaces:

- a SWMS must be completed for any work activity where penetrations are made through walls, ceilings or floors
- prior to conducting any work activity where penetrations are made through walls, ceilings or floors, site plans must be reviewed (where available) to identify the location of services

- services in the vicinity of penetration work must be positively identified using non-destructive methods such as visual identification, x-ray or magnetic induction
- ensure a structural assessment is undertaken by a RPEQ engineer before a penetration is made that may cause structural damage or weaken a structure, such as any penetrations in a reinforced concrete wall, ceiling or floor
- a Penetration Permit (FRM-00636) is required for all penetrations that may impact on structural integrity, including penetrations into solid walls, ceilings and floors that:
  - are deeper than 50mm and greater than 50mm diameter
  - penetrate all the way through solid materials in walls, ceilings or floors.

4.1.3 Hierarchy of controls for managing risks

The hierarchy of controls must be used to identify the most appropriate risk control measure to manage the risks associated with excavation, trenching or penetrations. The identification and selection of risk control measures must be undertaken in consultation with workers.

Hierarchy of Controls	Example of possible risk control
Elimination (Highest level)	Eliminate the requirement to undertake trenching work through the use of directional tunnelling. Use temporary fencing that does not require star pickets instead of erecting a temporary barrier using star pickets driven into the ground.
Substitution	Replace the process, plant or equipment with an alternate i.e. use vacuum excavation instead of using an excavator or backhoe.
Isolation	Isolate workers from hazards by installing barriers to separate pedestrians from excavation or trenching work. Isolate buried services to protect workers from hazardous energies in the event of accident contact.
Engineering	Design or re-design the process, plant or equipment (i.e. utilising shoring equipment to protect workers in a trench).
Administrative	Obtain and review site plans (where available) and 'Dial Before You Dig' information. Develop SWMS for undertaking tasks that involve excavation, trenching or penetrating activities. Erecting warning signage around the work area.
Personal Protective Equipment (PPE) (Lowest level control)	Hard hat, gloves, safety goggles, protective clothing, etc.

4.1.4 Location of underground services

Information requirements

The following information relating to underground services must be obtained before any excavation or trenching work is undertaken:

- whether underground services exist in the area
- the type of services
- the exact location, depth and direction of the services

- isolation points for the services (where required / available)
- confirmation of whether services can be de-energised during the work
- any specific restrictions to be followed during the work.

On-site location / confirmation of underground services

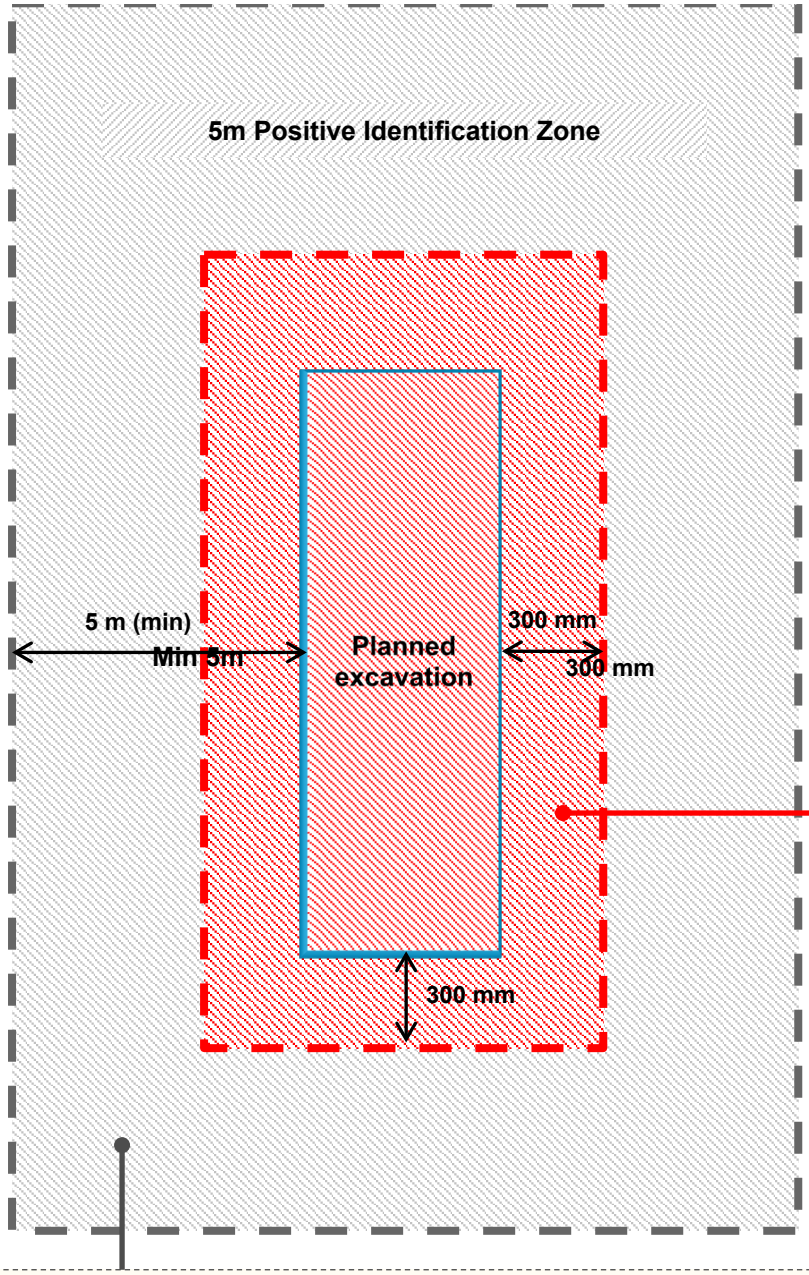
The following steps must be taken to positively identify the location of underground services prior to commencing excavation or trenching on a brownfield site:

- Detailed review of all available site plans, drawings and 'Dial Before You Dig' information relevant to the planned excavation area.
- A physical inspection of the planned excavation site and surrounding areas must be undertaken to assess the working environment and identify any other visual indicators of buried services. The following factors should be considered as part of this process:
  - the location of the services in relation to known, fixed assets (i.e. buildings, pits, powered infrastructure such as access gates, lighting etc.).
  - evidence of previous excavations (sunken areas, different soil type, previous line marking, cuts to paths and roadways, etc.).
  - consultation with workers that may have specific information or knowledge regarding underground services at the plant or workplace.
- Unless the entire planned excavation will be completed by non-destructive methods (e.g. vacuum excavation), services near the planned excavation must be **positively identified** and **potholed** as far as reasonably practicable in accordance with Figure 1 – Guidelines for Underground Service Location (shown overleaf) [1]

  [1] Additional service location requirements may be prescribed by asset owners (e.g. APA, Energex/Ergon Energy) when issuing DBYD plans or approving work near their high-risk assets.

Figure 1: Guidelines for Underground Service Location *(diagram not to scale)*

Unless the entire planned excavation will be completed via non-destructive methods, services must be located and marked as follows:



5m Positive Identification Zone:

Known services with potential to encroach within minimum **5 m** of the planned excavation must be positively identified using non-destructive methods and clearly marked on the ground for as long as they remain within the 5m radius[1].

[1] Positive identification includes the use of non-destructive methods to verify the location, depth and direction of buried services (this includes verifying the exact point where service change direction or intersect). Such methods may include the use of vacuum excavation (max pressure of 2000psi), ground penetrating radar/technology, insulated prodder, cable locators or hand digging.

Once the location of services is confirmed, their location should be clearly marked on the ground using one or more of the following methods:

- High visibility marking paint (refer Appendix A for colour code requirements); and/or
- Pothole markers (potholes should be dug and marked as per requirements detailed right and Figure 2 overleaf).

300mm Potholing Zone:

Any service encroaching within **300 mm** of the planned excavation must be visually verified by potholing (vacuum excavation or hand digging).

Unless services have been fully exposed within the planned excavation, potholing must be applied to the following minimum requirements:

Multiple potholes must be dug to confirm depth and direction of each service;

The exact point where services change direction or intersect must be visually verified;

Above ground markers showing the type and depth of each service must be installed;

Distance between potholes (and markers) should not exceed 3m on high risk sites[1] and 5m in other areas;

Pressure setting of vacuum excavation device must not exceed 2000 psi.

Refer Figure 2 overleaf for recommended pothole marking system.

Additional Precautions for Seqwater High Risk Sites[1]:

The following additional precautions must be applied before commencing mechanical excavation on a Seqwater high risk site[1].

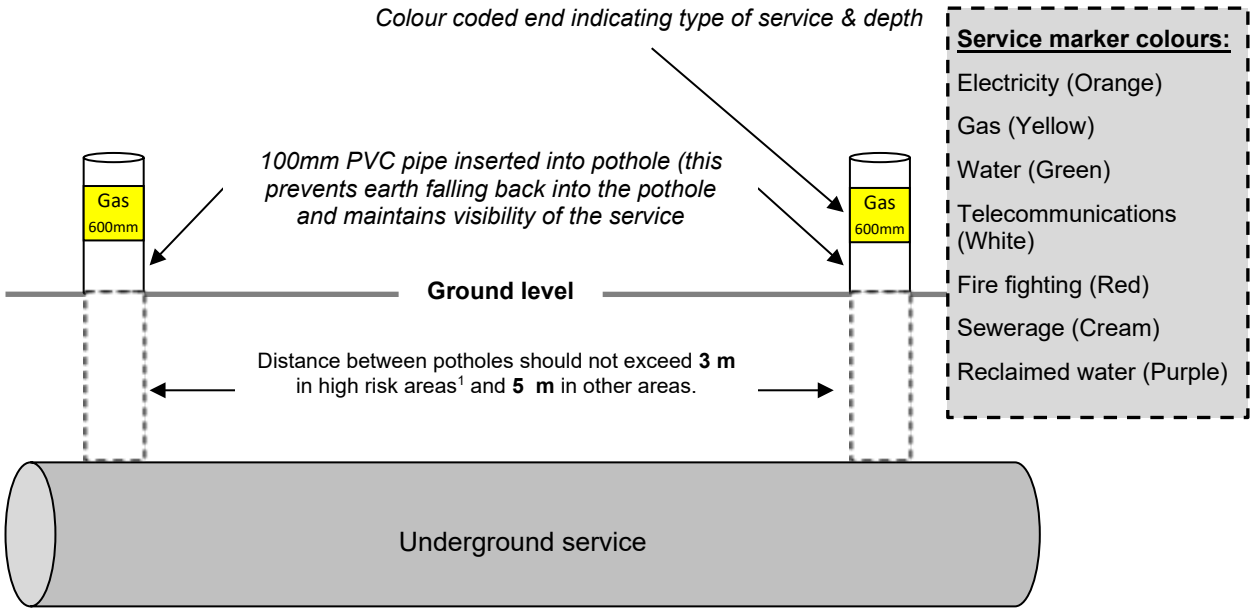
These precautions apply irrespective of whether plans/drawings have identified buried services near the planned excavation.

1. Precautionary slit trench around the perimeter of the planned excavation using non-destructive methods (recommended where practicable giving due regard to the scale of planned excavation).	To be applied: • Around the perimeter of the planned excavation; • To a depth at least equal to the lesser of the: - planned excavation; or - maximum range of the vacuum device (recommended min depth of 2 – 2.5m)
2. Precautionary investigation using ground penetrating radar / technology	To be applied: • In a continuous line along the planned excavation; • To a depth 300mm deeper than the planned excavation (or max range of detection device). • In a pattern that spans at least 300mm from all sides of the planned excavation.

If a new service is identified, it must be potholed as per above requirements.

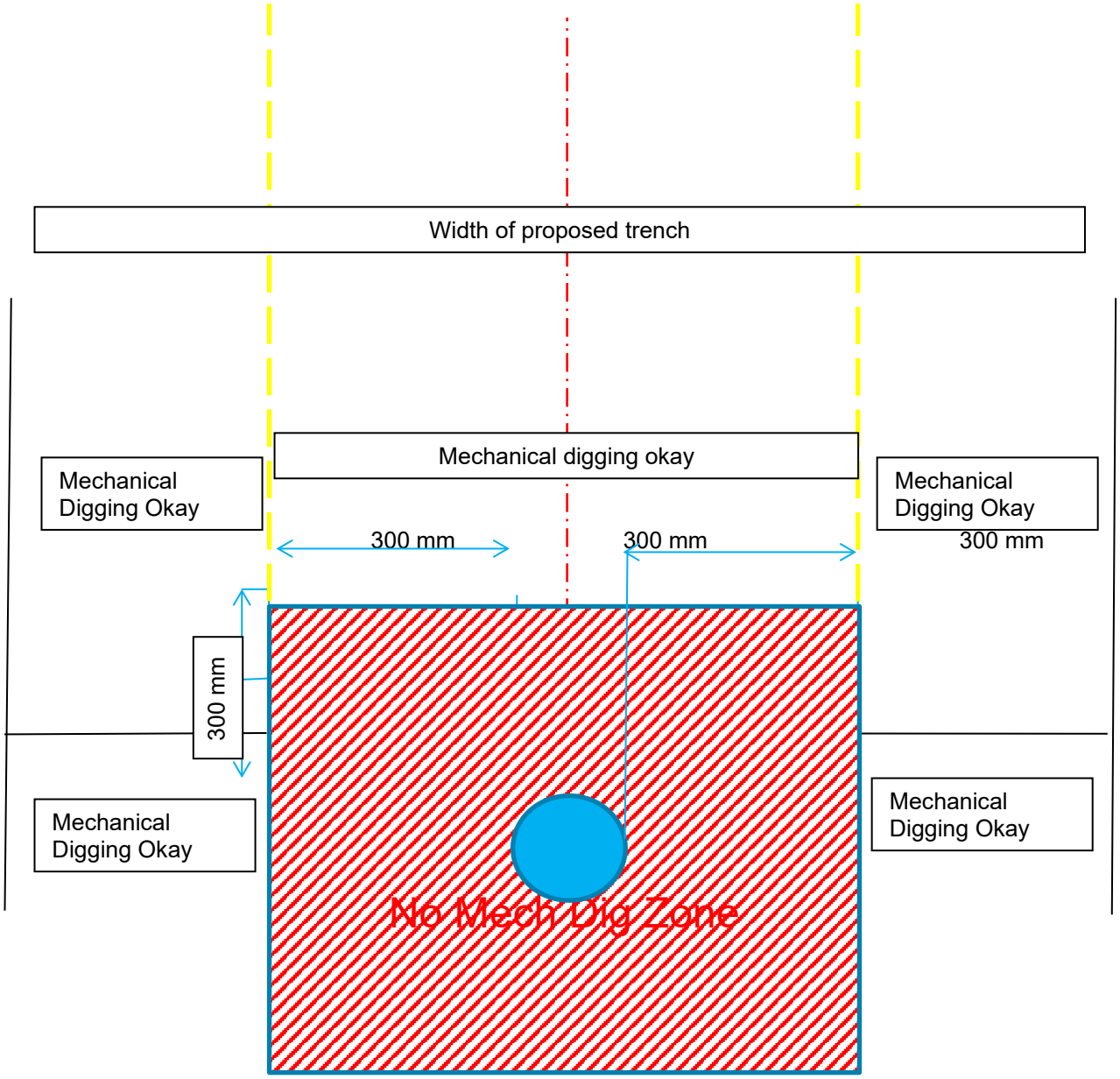
[1] High risk sites include WTPs and other Seqwater sites/areas where the type or complexity of buried services could present a serious risk to safety or the supply of essential services.

Figure 2: Recommended Pothole Marking System



[1] High risk sites include Water Treatment Plants (WTPs) and other Seqwater sites/areas where the type or complexity of underground services presents a serious risk to safety or supply of essential services.

Figure 3: Minimum separation while mechanically excavating



4.1.5 Third party excavations near Seqwater underground assets

This section applies where a third party (not engaged by, or working on behalf of Seqwater) makes a request to undertake mechanical excavation within **5m** of a Seqwater underground asset.

As part of the approval process, the party commissioning the work must submit the following documentation to consents@seqwater.com.au:

- A work methodology statement (this is necessary to assess potential impacts such as vibration and load bearing that may compromise the integrity of buried assets)
- A SWMS outlining controls for the positive identification and protection of Seqwater underground assets. These controls should address the following:

a. Detailed retailed review of all available site plans, drawings and 'Dial Before You Dig' information relevant to the planned excavation area.

b. Physical site inspection of the planned excavation site and surrounding area to assess the working environment and identify any other visual indicators of buried services. Where practicable, persons with local knowledge of the relevant Seqwater underground asset(s) should be consulted as part of this process.

c. Seqwater assets with potential to encroach within 5 m of the planned excavation must be visually verified by potholing as far as practicable (vacuum excavation or hand digging). The distance between potholes (and associated pothole markers) should not exceed 5 m (this distance should be reduced as required to accurately detect potential changes in service depth or direction). Where potholing is not practicable (as agreed by Seqwater), alternative non-destructive methods must be used to positively identify Seqwater assets within 5m of the planned excavation – In such cases potholing is however mandatory for any part of the asset that encroaches within minimum 300mm of the planned excavation.

d. A minimum separation distance of 300 mm must be maintained between the edge of any buried Seqwater asset and mechanical digging components such as buckets, augers or similar attachments. In such instances the edge of the buried asset must be visually confirmed by non-destructive methods prior to mechanical excavation. Any digging within 300 mm must be undertaken by non-destructive methods such as vacuum excavation or hand digging.

Upon acceptance by Seqwater of the proposed work method and associated SWMS, access to site must be lodged and managed in accordance with the Permit Access Safety System (PASS) Procedure (PRO-01820).

For further information regarding Seqwater consent processes and specifications refer to the Seqwater Network Consent Guidelines (TRIM reference D14/68930).

Distribution of information

All information related to underground services located in the area where excavation or trenching is to occur must be:

- made available to any worker, principal contractor and sub-contractor
- made available for inspection during the work as required by the *Work Health and Safety Act 2011* (Qld)
- retained until the excavation or trenching work is completed or, if there is a notifiable incident relating to the excavation or trenching work, for at least two years after the incident occurs.

Updating underground service information

Following the completion of excavation and trenching work, workers responsible for supervising the work must ensure that relevant site drawings and underground service maps are updated with accurate information for the services identified.

Specific requirements for updating underground service information are defined in section 4.4 of this Procedure.

If damage to underground services occurs

If any damage occurs to underground services during excavation or trenching work, the following actions must be undertaken:

- ensure workers are safe (where contact is made with electrical services, plant operators should remain in the cabin of the plant until the area is deemed safe)
- undertake isolations where required / where practicable
- notify the relevant Seqwater manager
- notify the owner of the underground service
- lodge details of the event with the Seqwater Incident Hotline (07) 3270 4040.

Any incidents and emergencies involving damage to underground services must be escalated in accordance with the Emergency Preparedness and Response Procedure (ERP-00079) and the Emergency Response Plan for that workplace.

4.1.6 Preventing ground collapse

Ground collapse is one of the primary risks to be controlled when undertaking excavation or trenching work. Ground collapse can occur very quickly and without warning, giving a worker virtually no time to escape, especially if the collapse is extensive. A buried worker may die from suffocation before they can be extracted from the collapsed area.

One or a combination of the following risk control measures must be implemented prior to any person entering an excavation or trench with a depth of 1.5 metres or more, or, regardless of depth, for excavations or trenches dug in poor soil conditions where there is a risk of engulfment:

- Benching (maximum bench height must not exceed 1.5 m unless designed and certified in writing by a RPEQ engineer)
- Battering (angle of repose must not exceed 45 degrees unless designed and certified in writing by a RPEQ engineer)
- shoring, trench boxes or other ground support systems
- written assessment from a RPEQ engineer warranting that there is no risk of collapse.
- Additional details regarding the specific requirements and use of these risk controls in the prevention of ground collapse are contained in the *Excavation Work Code of Practice* (Qld).

4.1.7 Supervision

All excavation and trenching work must be adequately supervised by a worker with appropriate training and experience in the work being undertaken.

Whilst a worker is in an excavation or trench greater than 1.5 metres in depth, there shall be at least one person (spotter) at ground level monitoring the work activity from a safe location.

No workers shall be present in an excavation or trench while that part of the excavation or trench is being mechanically dug.

4.1.8 Barricades and signs

All excavations and trenches greater than 1.5 metres in depth must be protected by barriers and signs to prevent unauthorised access (including inadvertent entry).

Where practicable, excavations and trenches less than 1.5 metres in depth should be protected by barriers and signs to restrict entry to the work area. When selecting barricading and signage requirements, the following should be considered:

- a barricade or hoarding, at least 900mm high, must be erected to restrict access to any excavation or trench
- signage (i.e. Danger – Do Not Enter) must be erected at locations surrounding the excavation or trench to warn of the hazards in the area
- barricades around excavations and trenches should encompass spoil piles and any plant and equipment involved with the work
- where practicable, barricades and signs should be placed at safe distances from edges to allow safe movements within the barricaded area
- additional protection should be provided where there is a risk of materials falling on workers within an excavation or trench (i.e. exclusion zones surrounding the trench or excavation, installation of toe boards, etc.)

- barricades and signs must remain in place until all excavation or trenching work is complete.

4.1.9 Covers

- Where practicable, covers should be placed over excavations or trenches that are:
- likely to be accessed by unauthorised personnel (i.e. in public areas)
- in highly trafficked areas
- the excavation or trench will be left open for more than 24 hours.

Covers must be designed and installed to sufficiently support the weight of any traffic that will potentially access the cover (i.e. covers used in roadways must be able to support any vehicle likely to travel across the cover).

4.1.10 Powered mobile plant

The following risk controls must be implemented to manage the hazards associated with powered mobile plant utilised during excavation or trenching activities:

high-risk work license

- traffic management plans including signs to indicate traffic direction and locations of hazards
- effective communication systems between plant operator and ground workers
- effective warning devices fitted to plant (reversing alarm and revolving light)
- identification of blind spots
- exclusion zones for ground personnel as required by the Safe Work with Plant Procedure (PRO-00867)
- as far as practicable, the type of bucket or mechanical digging component should be selected to minimise potential damage in the event of accidental contact with a live buried service (e.g. use of toothless excavator buckets when digging near buried services)
- inductions
- high visibility clothing and other PPE as required.

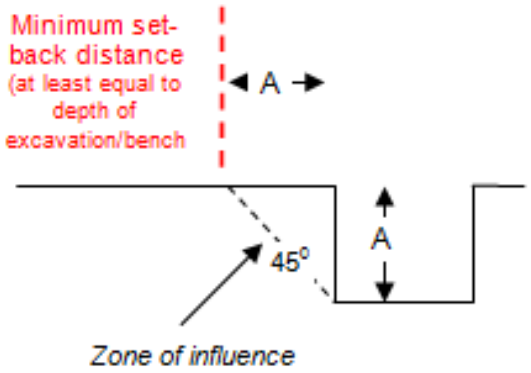
Powered mobile plant must be operated and maintained in accordance with the requirements of the Safe Work with Plant Procedure (PRO-00867).

4.1.11 Exclusion zones

Exclusion zones must be established for excavation and trenching activities. When establishing exclusion zones the following should be considered:

- plant must not be positioned in an area where exhaust fumes could create an unsafe atmosphere within an occupied excavation or trench.
- no person shall be present in an excavation or trench where there is a risk of harm from plant falling into the occupied area
- all spoil and debris must be stored at least one metre from the edge of an excavation or trench
- heavy loads must not be positioned within the ‘zone of influence’ of the excavation/trench. This zone is shown in Figure 4 below (refer to the *Excavation Work Code of Practice* (Qld) for further detail).

Figure 4: Set-back distance for heavy loads



- a minimum separation distance of **300 mm** must be maintained between any live buried service and mechanical digging components such as buckets, augers or similar attachments. Non-destructive methods such as vacuum excavation or hand digging must be used where it is necessary to excavate within the minimum separation distance [1, 2].

[1] A greater separation distance and additional controls may be prescribed by asset owners (e.g. APA, Energex / Ergon Energy) when issuing DBYD plans or approving work near their high-risk assets.

[2] Exceptions may apply where it is absolutely necessary to use powered equipment to remove concrete or bitumen to facilitate non-destructive potholing/excavation. In such cases the depth of the service must be confirmed as far as practicable prior to starting and robust controls implemented to prevent damage or contact with the service.

- Exclusion zones must be maintained around overhead electricity lines in accordance with Electrical Safety Procedure (PRO-00006).
- The establishment of exclusion zones must be clearly defined (i.e. using line marking paint, barricades, signs, SWMS etc.) and conveyed to all workers entering the excavation or trenching area.

4.1.12 Access and egress

Where workers are required to enter an excavation or trench, a safe means of access and egress must be provided. When establishing access and egress arrangements, the following should be considered:

- where an excavation or trench cannot be easily walked into, ladder access must be provided (refer to the Prevention of Falls Procedure (PRO-00015) for requirements associated with the safe use of ladders)
- ladders must be provided at a maximum of nine metre intervals for the length of the excavation or trench
- ladders must extend at least one metre above the edge of the trench
- no person shall be present in an excavation or trench where there is a risk of harm from plant falling into the occupied area.

4.1.13 Managing the risk of falls

Where any work activity is undertaken in a location where, if a worker was to fall, an injury is reasonably likely to occur, appropriate risk control must be implemented to eliminate or mitigate the risk. As a minimum, Seqwater considers any work performed at a height of two metres or greater as likely to injure a worker should they fall.

Hazards associated with working in a location where there is a potential to fall must be assessed and managed in accordance with the Work at Heights Procedure (PRO-00015).

4.1.14 Managing overland water flow and groundwater

If there is a likelihood of rain or other influx of surface water into an excavation or trench, one or a combination of the following should be constructed where practicable to eliminate or reduce the influx of water into the excavation:

- spoon drains
- earth dams
- temporary piping.

If there is a likelihood of water inrush or seepage of groundwater into an excavation or trench, one or a combination of the following should be considered to eliminate or reduce the influx of water into the excavation:

- pumps or other dewatering systems in the excavation or trench to remove water and prevent build-up
- drains or other pipes constructed from the excavation or trench
- constructing dewatering wells adjacent to the excavation or trench to lower the water table at the location of work.

Risk controls for managing overland flows or groundwater must remain in place for the duration of excavation or trenching activities.

4.1.15 Controlling sediment run-off

Sediment run-off as a result of undertaking excavation or trenching work can cause significant environmental and safety issues. All disturbed soil must be managed to reduce the risk of sediment run-off entering drains, catchments and waterways or spreading across paths and roadways.

The following risk controls must be used to prevent or mitigate the effects of sediment run-off when undertaking excavation or trenching:

- do not place any materials (e.g. spoil, sand, gravel) in gutters or drains
- use barriers if spoil is being left exposed for periods greater than 24 hours or if rain is forecast (e.g. sediment fence, geo-textile filter, hay bales)
- where possible, leave a strip of grass between any disturbed soil and gutters, drains or waterways
- use rubble strips or wash-down areas at the exit points from excavation or trenching works to reduce the export of soil from the site on vehicle tyres.

Following completion of trenching and excavation work, sediment controls must remain in place and be maintained until such time as all disturbed soil is protected from erosion (i.e. turf is laid and established, grass seed is sown and established at the excavation area, hydro mulch is laid).

4.1.16 Contaminated atmosphere

Excavations and trenches may become contaminated with gases that create a hazardous atmosphere (i.e. suffocation risk, poisoning risk, explosion risk, etc.). Excavations and trenches may become contaminated from the following:

- contamination from exhaust gasses
- contaminated soil
- sewer leaks
- use of substances in or near the excavation

naturally occurring emissions from disturbed soils i.e. acid sulphate soil.

Where gas monitoring or risk assessment outcomes indicate there is a potential for an excavation or trench to contain an unsafe atmosphere, the excavation or trench must be treated as a confined space and risk controls must be implemented in accordance with the Confined Space Management Procedure (PRO-00443).

4.1.17 Controlling dust (including silica containing material)

The generation of dust as a result of undertaking excavation or trenching work can cause significant environmental and safety issues. All work areas must be managed to eliminate or reduce the generation of dust.

Refer to Worksafe Queensland website for guidance on the management of silica dust.

The following risk controls must be used to prevent or mitigate the effects of dust when undertaking excavation or trenching:

- use water trucks or water hoses to reduce dust generation
- where possible, use established roadways to move around excavation or trenching sites
- develop traffic management plans to restrict access to and control movement within the excavation and trenching site (including speed limits).

4.1.18 Environmental permits and licences

Workers must consult with the Seqwater Environment Heritage Land Use Planning (EHLUP) prior to undertaking any excavation or trenching works including, but not limited to, the following areas:

- within the banks of a creek, river, waterway, wetland or riparian area
- within tidal waters or land in the vicinity of tidal waters
- work that may create a barrier to fish and other aquatic life movement along waterways
- within a national or state forest
- within the Moreton Bay Marine Park
- in a vegetated area
- where contaminated soil will be disturbed and / or removed
- where Potential Acid Sulphate Soil (PASS) or Actual Acid Sulphate Soil (AASS) will be disturbed and / or removed.

Complete FRM-00649 Small & Medium Scale Works Checklist prior to commencement of any works.

Where an environmental permit or licence is issued to undertake excavation and trenching work, all work at the site must comply with the conditions of the permit or licence.

4.1.19 Contaminated soil

Workers must consult with the EHLUP prior to undertaking any excavation or trenching work on contaminated land or on land where it is suspected that there is contaminated soil.

The Seqwater Geographical Information System (GIS) includes a layer that identifies sites of existing or potentially contaminated soil. The Seqwater GIS can be accessed from the Seqwater intranet page.

Where excavation or trenching must be undertaken on contaminated land, a core sample of the soil must be collected and analysed to confirm the type of contamination. Contaminated soil must not be removed from a site until a permit is received from the Department of Environment and Science (DES).

Any soil contaminated with asbestos must be managed in accordance with the Asbestos Management Procedure (PRO-01752).

4.1.20 Acid sulphate soil

Workers must consult with the EHLUP prior to undertaking any excavation or trenching work on land where Actual Acid Sulphate Soil (AASS) is present or where there is Potential Acid Sulphate Soil (PASS).

The Seqwater GIS system includes a layer that identifies sites of known acid sulphate soil. The Seqwater GIS can be accessed from the Seqwater intranet page.

As a minimum, where any excavation or trenching activities are planned to be undertaken on land that is less than five metres above the Australian Height Datum (AHD), an assessment must be undertaken to determine if AASS is present.

Following confirmation of the presence of AASS, appropriate controls must be implemented to manage the risks associated with disturbing the soil. Untreated AASS can only be disposed of at a landfill site.

4.1.21 Fire ants

Workers must consult with the EHLUP prior to undertaking any excavation or trenching work in a fire ant restricted area.

The Seqwater GIS system includes a layer that identifies fire ant restricted areas. The Seqwater GIS can be accessed from the Seqwater intranet page.

All excavation or trenching activities undertaken within, or movement of soil within or from, a fire ant restricted area must comply with the requirements of the general biosecurity obligations under the *Biosecurity Act 2014*.

All plant must be cleaned and inspected to ensure all soil is removed before the plant leaves an excavation or trenching site within a fire ant restricted area.

4.1.22 Prohibited and Restricted Matter

There are a number of prohibited and restricted matters (weeds) in Southeast Queensland that must be controlled because they have, or could have, serious economic, environmental or social impacts. Landowners, including all landowning state agencies, have legal obligations to control declared weeds on land under their management.

Workers must consult with the Seqwater Catchment Biosecurity Team prior to undertaking any excavation or trenching work in an area where declared weeds have been identified. Any plant or vehicles used to undertake excavation or trenching activities must be cleaned and inspected to ensure that all plant material and soil has been removed before the plant or vehicle leaves the excavation or trenching site.

Details of declared weeds can be accessed on the Department of Agriculture & Fisheries website.

Predictive weed maps have been developed to identify potential weed distributions within Queensland. The predictive weed maps can be accessed on the Department of Agriculture & Fisheries website.

4.1.23 Cultural heritage

When planning to undertake excavation or trenching activities in an area not previously subject to significant ground disturbance or in an area where a Cultural Heritage Management Plan (or other cultural heritage agreement) is in place, workers must consult with the Aboriginal Heritage Officer to identify the likelihood of harm to Aboriginal cultural heritage in the area to be disturbed.

A cultural heritage field assessment may be required to be undertaken in accordance with the Seqwater Aboriginal Cultural Heritage Compliance Manual (MAN-00256) and companion Aboriginal Cultural Heritage Field Guide (D14/18349). If Aboriginal cultural heritage is identified at the location where trenching or excavation will be undertaken, work must stop immediately and workers must consult these documents for guidance on how to proceed.

Workers should also request the assistance of the Aboriginal Heritage Officer to provide advice and support, and to act as the point of contact with the Aboriginal Party for the area.

4.1.24 Overhead electricity lines

Where excavation or trenching work is undertaken in an area containing overhead electrical lines, appropriate risk control measures must be implemented. When establishing risk control measures for managing the hazards associated with overhead electrical lines, the following should be considered:

- the location of the electrical lines in relation to the excavation or trenching site
- the type of electrical line (i.e. voltage carried, insulated lines, etc.)
- the type and size of the plant being used for the excavation or trenching work
- the ability to isolate the source of electrical supply to the overhead lines for the duration of the work.

Risk control measures for managing the hazards of overhead electrical lines include:

- establishing an exclusion zone around the overhead electrical lines (specific requirements for electrical exclusion zones are defined in the Electrical Safety Procedure (PRO-00006))
- placing tiger tails or similar high visibility devices on the overhead lines in the work area
- placing barriers and signage under the overhead electrical lines
- including the hazards of overhead electrical lines in inductions and pre-start meetings
- including the hazards of overhead electrical lines in all SWMS developed for the work activity.

4.2 Managing updates to drawings and plans

Where new underground services are installed at a Seqwater workplace, where the path of an existing underground service is modified in any way, or services are discovered that are not identified on current drawings, the following actions must be implemented:

- services are to be entrenched or filled in with sand or friable soil that is free of sharp stone
- colour coded marker tape and/or wire is to be located approximately 200mm above the service (refer to Appendix A for marker tape/wire colour requirements)
- on completion of all excavation work, updates of all site service information on relevant plans, including the development of new or modified ‘As Built’ drawings must be completed in accordance with the requirements of Seqwater’s Drawing and Spatial Data Standards (X-PRO-STD-007).
- the ‘As Built’ drawings and supporting information must be forwarded to the Seqwater’s Standards and Specifications Team via engineering@seqwater.com.au.

Where previously unknown services are identified at non-Seqwater workplaces, notification must be provided to the asset owner where this is known. If the asset owner is not known, ‘Dial before you dig’ should be advised of the service by calling 1100.

4.3 Emergency Response

When establishing emergency procedures for excavation, trenching or penetration, the following factors must be considered:

- the nature of the work activity
- the location of the work activity
- communications from within the excavation or trench to other workers
- communications from the location of the work to emergency services
- rescue and resuscitation equipment and the availability of trained workers
- the physical capabilities of rescuers

- environmental conditions
- appropriate first aid equipment and the availability of trained workers
- the ability for local emergency services to respond and provide assistance in emergency situations.

4.3.1 Ground collapse

When a worker is in an excavation or trench greater than 1.5 metres in depth, there must be at least one other person at ground level. If a worker is trapped in an excavation or trench, the following actions must be undertaken:

- Send someone immediately to telephone or radio for emergency services. Ensure that the person knows the location of, and how to use the communication equipment.
- Look for evidence of where the trapped worker is located (i.e. tools, safety helmet etc.).
- Clear all unwanted workers away from the area.
- Appoint a worker to monitor the work area (i.e. an observer who is not involved in any rescue activities).
- If possible, batter the sides of the trench in the collapsed area or insert Shoring where possible to protect the victim and rescuers.
- Do not allow anyone above the collapsed soil as this will increase pressure on the victim.
- If the trench is greater than 1.5 metres in depth, rescuers are to wear safety harnesses and life lines which extend to the surface.
- When rescuers are near the victim, hands should be used to remove the soil if possible. If shovels have to be used, these are to be used with caution.
- When the victim is located, clear soil from their head and chest, and check for breathing and a pulse.
- If breathing has stopped, start Expired Air Resuscitation (EAR). Where breathing has stopped and pulse is absent, start Cardio-Pulmonary Resuscitation (CPR).
- In a trench collapse, there is always the possibility that the victim's chin could be jammed on his or her chest. If this is so, tilt the head back as soon as possible as this will open up the airway to the victim's lungs. This can be done while the rescuers are freeing the soil from the upper part of the body and prior to commencing expired air resuscitation.
- Check for injuries and apply first aid where necessary.
- **Do not** remove the victim unless there is a danger from flooding or dangerous gases are present or there is an imminent danger of further collapse.
- **Do not** remove the victim by tying a rope around him/her and pulling on the rope.
- Where possible (and safe), leave the victim in the trench until the ambulance or a qualified medical person arrives.

EXTREME CAUTION must be exercised where powered plant is used to find or extract a buried worker. Caution must be exercised to ensure that the victim does not incur additional injuries.

Under no circumstances must any person or equipment be allowed on top of the collapsed soil that may be on top of the victim as this would only add further pressure to the victim.

- After the worker has been removed from the collapsed Excavation or Trench, the following actions must be implemented:
- initiate the emergency response and incident notification processes by contacting Seqwater's incident hotline on (07) 3270 4040
- notify the manager and line supervisor responsible for the site and work being undertaken

- take appropriate actions to preserve the accident scene.

4.3.2 Contact with underground services

In the event of an underground service being contacted or damaged during excavation, trenching or when driving an object into the ground, the following actions are to be undertaken:

Contact or arcing with an underground electrical cable

Should contact be made with an underground cable or arcing between the cable and an item of plant and/or employee, the following actions must be taken:

- all work must cease immediately
- the plant operator should remain inside the cabin. If it is essential to leave the cabin or operators station due to fire or other life-threatening reasons, the operator should jump clear of the plant and try not to touch or grab anything on the way out
- the plant operator should not touch the equipment and ground at the same time
- when moving away from the equipment, the plant operator should hop slowly, shuffle or jump away from the plant (with feet together) until at least 10 metres from the nearest part of the plant
- warn all other workers / public to keep at least 10 metres clear from plant
- where possible, isolate the source of the electricity
- do not touch any part of the equipment or load and do not attempt to approach or re-enter the vehicle until the relevant authorities have determined the site is safe
- facilitate first aid treatment and seek medical aid as required
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040.

Contact or damage to gas assets

Should contact be made with gas assets, the following actions must be taken:

- all work must cease immediately
- the plant operator is to shut down the plant unless this process may provide an ignition source for any escaping gas
- leave the cab or operator station, trench or enclosure and maintain an exclusion perimeter due to the risk of explosion or fire
- do not attempt to use any instrument which may provide an ignition source near the gas escape. This may include mobile phones, two-way radios, etc.
- facilitate first aid treatment and seek medical aid as required
- warn all other workers / public to keep clear from the worksite and equipment and ensure no person is smoking
- where possible isolate the source of the gas
- do not attempt to approach or re-enter or start the plant until the relevant authorities have determined the site is safe.
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040.

Contact or damage to water assets

Should contact be made with water assets, the following actions must be taken:

- all work must cease immediately

- where possible the plant operator should use the bucket of the plant being used (if any) to undertake the excavation to reduce the water flow
- where possible isolate the source of the water
- warn all other workers / public to keep clear from the worksite and equipment
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040.

Contact or damage to sewerage assets

Should contact be made with sewerage assets, the following actions must be taken:

- all work must cease immediately
- where possible, the plant operator should use the bucket of the plant being used (if any) to undertake the excavation to reduce the flow of sewage
- where possible isolate the source of the sewage
- if workers have come into contact with sewage they should remove any contaminated clothing and wash themselves down with copious amounts of water and soap (where available)
- if a worker ingests sewage, medical advice should be sought immediately
- if a worker develops symptoms of nausea, vomiting, diarrhoea or fever, medical advice should be sought immediately
- warn all other workers / public to keep clear from the worksite and equipment
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040.

Contact or damage to chemical assets

Should contact be made with chemical assets, the following actions must be taken:

- all work must cease immediately
- where possible the plant operator should use the bucket of the plant being used (if any) to undertake the excavation to reduce the flow of chemicals
- where possible isolate the source of the chemicals
- if workers have come into contact with chemicals they should remove any contaminated clothing and wash themselves down with copious amounts of water
- if a worker ingests a chemical, medical advice should be sought immediately
- if a worker develops symptoms of nausea, vomiting, diarrhoea, fever, burning sensation or adverse skin reactions, medical advice should be sought immediately
- warn all other workers / public to keep clear from the worksite and equipment
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040.

4.3.3 Contact with overhead electrical lines

Should contact be made with an overhead electrical line or arcing between the line and an item of plant and/or employee, the following actions must be taken:

- all work must cease immediately

- the plant operator should remain inside the cabin. If it is essential to leave the cabin or operators station due to fire or other life-threatening reasons, the operator should jump clear of the plant and try not to touch or grab anything on the way out
- the plant operator should not touch the equipment and ground at the same time
- when moving away from the equipment, the plant operator should hop slowly, shuffle or jump away from the plant (with feet together) until at least 10 metres from the nearest part of the plant
- warn all other workers / public to keep at least 10 metres clear from plant
- where possible isolate the source of the electricity
- do not touch any part of the equipment or load and do not attempt to approach or re-enter the vehicle until the relevant authorities have determined the site is safe
- facilitate first aid treatment and seek medical aid as required
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040 and the relevant energy company (e.g. Energex, Powerlink Queensland etc).

4.3.4 Asset damage

Should asset damage occur as a result of excavation, trenching, driving an object into the ground or through penetration activities, the following actions must be taken:

- all work must cease immediately
- the asset must be made safe
- where possible, rectification work should be undertaken to prevent further asset damage occurring
- notify the asset owner of the damage
- initiate the emergency response and incident notification processes, including contacting Seqwater's incident hotline on (07) 3270 4040.

4.4 Principal Contractor requirements

Where excavation, trenching, driving an object into the ground or penetration activities are within the scope of work of an appointed principal contractor, the principal contractor must ensure all work undertaken meets or exceeds the rules for excavating, trenching and penetration at Seqwater workplaces. This includes integration of these requirements into relevant SWMS for construction activities.

Management of works being undertaken by a principal contractor must be undertaken in accordance with the requirements of the Contractor Management Procedure (PRO-00808).

5 Deviations to this Procedure

Deviations to the requirements outlined in this Procedure must be approved by Seqwater management via completion of the HSWMS Deviation Approval Form (FRM-00795). This includes the completion and approval of a detailed risk assessment for the proposed deviation.

6 Definitions

Term	Definitions
AASS	Actual Acid Sulphate Soil
Airborne Contaminant	Any impurity present in the air that may be harmful to persons.
Battering	Where the wall of an excavation is sloped back to a predetermined angle.
Benching	The creation of stepped sides to an excavation, by forming a series of vertical and horizontal planes on either side of the excavation site.
Brownfield site	Land currently or previously used for industrial purposes or some commercial uses, it includes any land that is not a greenfield site. Land within brownfield sites has greater risks of the presence of underground services or contaminated soils. Where there is uncertainty regarding the classification of a worksite, the area should be treated as a brownfield site.
Cable locator	An instrument used to locate underground cables, wiring and pipes. Cable locators can be used not only to locate the cabling but to estimate the depth of the wiring.
Confined space	An enclosed or partially enclosed space that: • is not designed or intended primarily to be occupied by a person; and • is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and • is, or is likely to be, a risk to health and safety from: o an atmosphere that does not have a safe oxygen level o contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion o harmful concentrations of any airborne contaminants o engulfment Entry into a confined space means a person's head or upper body is in the confined space or within the boundary of the confined space
Digging	Any activity involving the use of hand tools to move soil or other materials. Digging does not include the digging or movement of material stockpiles, the digging of garden beds, cleaning of culverts around drains to the natural ground shape etc.
Excavation	A hole in the earth, or a face of earth, formed after rock, sand, soil or other material is removed e.g. a trench, ditch, well, tunnel, pier hole, cutting, caisson, cofferdam or a hole drilled in the earth.
Excavation Work	Work to make, fill or partly fill an excavation. This does not include a bore to which a relevant water law applies.
Greenfield site	Undeveloped land in a city or rural area either used for agriculture, landscape designs, or left to evolve naturally and which is free of services or contaminated soils. Where there is uncertainty regarding the classification of a worksite, the area should be treated as a brownfield site as defined above.
Ground penetrating radar	A geophysical method that uses radar pulses to image the subsurface. This nondestructive method uses electromagnetic radiation in the microwave band (UHF/VHF frequencies) of the radio spectrum, and detects the reflected signals from subsurface structures.

Term	Definitions
High risk site	High risk sites include Water Treatment Plants (WTPs) and other Seqwater sites/areas where the type or complexity of underground services presents a serious risk to safety or supply of essential services.
Insulated prodder	A probe used to penetrate the ground to locate underground services. The probe is insulated to protect the user from an electric shock should the probe contact live electrical services.
Mechanical excavation / digging	Excavation / digging undertaken using powered plant such as excavators, backhoes, directional drilling equipment, augers or similar attachments. It does not include the use of non-destructive methods such as vacuum excavation.
PASS	Potential Acid Sulphate Soil
Penetration	An opening made by drilling, coring, cutting, or otherwise piercing a wall, ceiling or floor. This does not include the placement of thumbtacks, picture nails, or similar items in a hollow wall or ceiling that do not go beyond the thickness of the external material (i.e. gyprock sheeting, wood panelling, roof tiles, etc.)
Personal Protective Equipment (PPE)	Any clothing, equipment or substance designed to protect a person from risks of injury or illness.
Plant	Includes any machinery, equipment, appliance, container, implement and tool, and includes any component or anything fitted or connected to any of those things. Plant includes items as diverse as lifts, cranes, computers, machinery, conveyors, forklifts, vehicles, power tools, playground equipment and cathodic protection equipment. Plant that relies exclusively on manual power for its operation and is designed to be primarily supported by hand (e.g. a screw driver) is not covered by the *Work Health and Safety Regulation 2011* (Qld). The general duty of care under the *Work Health and Safety Act 2011* (Qld) applies to this type of plant. Certain kinds of plant, such as forklifts, cranes and some pressure equipment, require a licence from the WHS regulator to operate and some high-risk plant must also be registered with the WHS regulator.
Potholing	The excavation of small areas of soil to locate underground services. Potholing is generally undertaken by hand, using vacuum excavation or other non-destructive methods.
Poor ground conditions	Ground conditions where there is an increased risk of collapse due to previously dug soil, the existence of filled land, the presence of groundwater or sand. When there is any doubt regarding ground conditions in an area where an excavation or trench is planned, geotechnical advice should be sought and appropriate risk control measures implemented.
Poor soil conditions	In relation to this Procedure, poor soil conditions relate to conditions where there is an increased risk of soil collapse as a result of undertaking excavation or trenching activities.
Positive identification	Positive identification includes the use of non-destructive methods to confirm the location, depth and direction of underground services. Such methods include the use of vacuum excavation, ground penetrating radar/technology, insulated prodder, cable locators or hand digging.

Term	Definitions
Prescribed information about underground service	Information about the service necessary to safely do excavation work at or near the service including: • the location of the service • the type of the service • the depth of the service • for an electrical service – whether the service is or is not live • the restrictions to be followed in doing the work.
Principal Contractor	The person conducting a business or undertaking appointed by Seqwater as the principal contractor for a construction project, and given the management and control of the workplace at which the construction project will be carried out and who discharges the duties of the principal contractor under the *Work Health Safety Act 2011 Qld* and *Work Health Safety Regulation 2011 (Qld)*. A principal contractor is to be appointed by Seqwater for a construction project.
Reinforced concrete	Poured concrete containing steel bars or metal netting to increase its tensile strength.
RPEQ Engineer (Registered Professional Engineer Queensland)	An engineer registered under the *Professional Engineers Act 2002 (Qld)* with the Board of Professional Engineers of Queensland. In relation to excavation advice, the person must hold a professional engineering qualification relevant to geo-technology.
Safe Work Method Statement (SWMS)	A SWMS sets out steps to enable supervisors, workers and any other persons at the workplace to understand the requirements that have been established to carry out the high-risk construction work in a safe and healthy manner. It sets out the work activities in a logical sequence and identifies hazards and describes control measures.
Shoring	A system of temporary supports and sheeting material used to maintain the stability of the sides of an excavation. Shoring may also be known as shielding.
Tiger Tails	Plastic pipe type cable covers, used to provide a useful visual indication to people working in the vicinity of overhead electric lines or stay wires. Tiger tails do not insulate wires.
Trench or Trenching	A horizontal or inclined way or opening: • the length of which is greater than its width and greater than or equal to its depth; and • that commences at and extends below the surface of the ground; and • that is open to the surface along its length
Underground Service	A cable, pipe or other thing buried, laid or installed underground for the transmission, transportation or storage of electricity or a substance
Vacuum excavation	A means of soil extraction through the use of a vacuum. Water or air jet devices are commonly used for breaking the soil to allow for extraction.

7 Roles and Responsibilities

Role	Responsibility
Environment Heritage Land Use Planning (EHLUP)	• Provide advice, guidance and support on the management of any environmental risks associated with trenching, excavation or penetration work, including any requirements for environmental permits or licences.
HSW Regional Partner	• Provide HSW support to all Seqwater employees or representatives undertaking excavation, trenching or penetration work activities. • Undertake regular audits, inspections and safety observations of workers, contractors and sub-contractors. • Conduct an investigation of all incidents that occur in accordance with the Incident Investigation Procedure (PRO-00793).
Manager, HSW	• Provide appropriate HSW resources to support the implementation and monitoring of this Procedure. • Complete workplace monitoring activities to verify the implementation and effectiveness of this Procedure. • Provide appropriate resources to review and inspect work conducted at Seqwater workplaces to verify compliance with the requirements of this Procedure.
Managers	• Provide appropriate resources to adequately implement the processes detailed in this Procedure. • Complete workplace monitoring of work activities within their area of responsibility to verify that identified hazards are being effectively managed and the requirements of this Procedure are being consistently complied with. • Ensure this Procedure is effectively implemented and communicated within their area of responsibility.
Permit Recipient	• Complete relevant sections of the Excavation and Trenching Permit (FRM-00413) or Penetration Permit (FRM-00636). This includes obtaining sign-off on 'hold points' as specified in permits before proceeding with work. • Select, document and implement appropriate risk controls prior to commencing any work that involves excavation, trenching or penetration. • Ensure all workers undertaking the task have read and understand the conditions of the relevant permit and any associated SWMS.

Role	Responsibility
Person with management or control of the excavation site	• Take all reasonable steps to obtain current underground essential services information relating to the workplace and areas adjacent to it before any excavation work starts, and provide this information to any person engaged to carry out excavation work. • Develop and provide workers with a SWMS for high risk excavation work. • Undertake a risk assessment in consultation with workers. • Identify and implement appropriate risk controls. • Provide information and instruction to all workers engaged in the excavation. • Secure the excavation work area from unauthorised access (including inadvertent entry). • Ensure regular inspections are completed of the excavation site. • Develop a High Risk Work Rescue Plan (TEM-00027) for work to be undertaken if a worker will be entering an excavation or trench greater than 1.5 metres in depth or where there is a risk of engulfment due to poor ground conditions.
Principal - HSW	• Coordinate HSW Regional Partner activities (including, but not limited to, inspections and safety observations) in regard to this Procedure.
Workers	• Follow any instructions in relation to undertaking excavation, trenching or penetration work activities. • Request a worker or contractor to stop work if there is an imminent risk to HSW, until that risk is eliminated or mitigated to an acceptable level as approved by the relevant manager. • Develop a SWMS to identify and implement risk control measures prior to commencing any excavation, trenching or penetration work activities. • Wear and maintain Personal Protective Equipment (PPE) as per training and instruction. • Comply with PPE signage requirements. • Report incidents to Seqwater's incident hotline (07) 3270 4040.

8 Training

All training required for a construction workplace where a principal contractor has been appointed must be provided by the principal contractor. The Seqwater project manager must liaise with the principal contractor to ensure that specific Seqwater training (e.g. Site Inductions, Permit Access Safety System – PASS etc.) is provided to the principal contractor's staff and other contractors as required.

All workers conducting high-risk construction activities must have successfully completed training and be licensed (where required) to conduct the high-risk work activity.

Person within Seqwater that supervise excavation works:

- should have completed RIICPL401A - Apply the principles for the installation of underground service using open excavation, or
- the person can demonstrate experience, knowledge and competency through
    - managing risks to health and safety of persons, and

- managing risks of damage to services and equipment associated with excavation work.

9 References

9.1 Legal and Other Requirements

Description
Work Health and Safety Act 2011 (Qld) *and Work Health and Safety Regulation 2011* (Qld)
AS 2700 Colour Standard for general purposes
Excavation Work Code of Practice
AS 1345 Identification of the contents of pipes, conduits and ducts
Queensland State Archives General Retention and Disposal Schedule for Administrative Records
AS/NZS 2648.1 Underground Marking Tape – Non-detectable tape

9.1 Seqwater supporting system documents

HSW Procedures	HSW Supporting Documents	Other Documents
ERP-00079 Emergency Preparedness and Response Procedure PRO-00005 General Construction Procedure PRO-00006 Electrical – High and Low Voltage Procedure PRO-00015 Working at Height Procedure PRO-00443 Confined Space Management Procedure PRO-00657 Hazard Identification and Risk Management Procedure PRO-00808 Integrated Contractor Management Procedure PRO-00867 Safe Work with Plant Procedure PRO-00881 Personal Protective Equipment Procedure PRO-01752 Asbestos Management Procedure	FRA-00018 Management System Framework FRM-00413 Excavation and Trenching Permit FRM-00627 Job Safety and Environment Analysis / Safe Work Method Statement Checklist FRM-00636 Penetration Permit Form FRM-00795 HSWMS Deviation Approval Form GDE-00103 HSW Inductions Guideline TEM-00013 Safe Work Method Statement Template TEM-00027 High Risk Work Rescue Plan Template	D14/127617 Drawing and Spatial Data Standards (X-PRO-STD-007) D14/18349 Aboriginal Cultural Heritage Field Guide D14/68930 Network Consent Guidelines FRM-00649 Corporate – Environment and Heritage – Small & Medium Scale Works Checklist MAN-00256 Aboriginal Cultural Heritage Compliance Manual PRO-00002 Integration Management System Internal Audit Procedure PRO-00793 Incident Investigation Procedure PRO-01574 Training and, Competency Management Procedure