

Document owner	Head of Health Safety Environment and Quality
Document contact	Safety Operations Manager

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1. Purpose

The procedure defines the minimum requirements for the planning, risk management, control and execution of excavation work to eliminate or minimise risk to workers, contractors, the public, infrastructure and the environment.

2. Scope

This procedure applies to all:

- Unitywater team members, contractors and subcontractors involved in the planning, supervision or execution of excavation work
- excavation work undertaken on behalf of Unitywater
- excavation activities undertaken using manual methods, powered tools, mobile plant or excavation equipment
- workplaces under Unitywater's management or control where excavation work is undertaken.

Out of scope:

This procedure does not apply to:

- Principal Contractors appointed under the *Work Health and Safety Regulation 2011* (Qld), or their subcontractors working within a defined work area under the Principal Contractor's control. Excavation work within these work areas must be managed under the Principal Contractor's Safety Management System.

3. Roles and responsibilities

Position title	Responsible for
Executive Manager(s)	Executive Managers are responsible for ensuring: • adequate resources are available so all excavation activities can be effectively implemented and managed • excavation activities within their area of responsibility are undertaken in accordance with this procedure • appropriate assurance activities are implemented to monitor compliance with this procedure.
Branch Manager(s)	Branch Managers are responsible for ensuring: • appropriate systems and processes are in place to support compliance with this procedure • team members undertaking excavation activities are trained, competent and authorised • verification of Competency (VOC) is completed where required • compliance with this procedure is monitored through inspections, audits and reviews • appropriate resources are available to safely undertake excavation activities.

Position title	Responsible for
Head of Health Safety Environment and Quality	As Document Owner responsible for: - conducting and/or delegating regular reviews to ensure this document and related resources (e.g. forms, website) remain fit for purpose, consistent and current - approving this document for publication - ensuring all relevant stakeholders and team members have been consulted and feedback is captured and actioned (where applicable) - ensuring appropriate communication or training is provided to relevant team members when implementing new, amended or obsolete document (if applicable) - monitoring compliance with internal/external requirements (e.g. monitor legislation changes and assess/update this document when required).
Team leaders	Team Leaders are responsible for ensuring: - excavation activities are planned and coordinated in accordance with this procedure - a PICOW is appointed where required - competent and authorised people are assigned to excavation activities - required risk assessments, SWMS, permits and approvals are completed before work starts - appropriate resources, equipment and supervision are provided to safely undertake excavation activities - appropriate controls are implemented and maintained throughout excavation activities - compliance with this procedure is monitored through inspections, audits and reviews - identified hazards, incidents and non-conformances are addressed in a timely manner.
PICOW (Person in Charge of Works)	The PICOW is responsible for ensuring: - excavation work is planned, coordinated and conducted in accordance with this procedure - information gathering, service identification and service proving activities are completed before excavation work starts - excavation stability assessments are completed and appropriate controls are implemented before people enter an excavation - required risk assessments, SWMS, permits and approvals are completed before work starts - required controls are implemented, communicated and remain effective for the duration of the work - pre-start briefings are conducted before work starts - required inspections are undertaken and excavation conditions are monitored throughout the work - traffic management requirements are implemented where required - emergency and rescue arrangements are established and communicated - interface risks with other work activities are identified and managed - excavation work is stopped where conditions change, controls are no longer effective, or the work can no longer be undertaken safely - excavation work does not resume until hazards have been reassessed and appropriate controls implemented.
Mobile Plant Operators	The Mobile Plant Operator is responsible for: holding the required licence, certification and/or Verification of Competency (VOC) for the plant being operated

Position title	Responsible for
	• completing pre-start inspections and recording them where required • reporting defective or unsafe equipment and removing it from service where required • operating plant and equipment in accordance with manufacturer requirements, training and site controls • maintaining effective communication with the PICOW, Safety Observer and other people involved in the work • complying with applicable permits, risk assessments, SWMS and excavation controls • complying with exclusion zones, service protection requirements and excavation controls • immediately stopping work where conditions become unsafe, controls are no longer effective or communication is lost • immediately stopping work where unidentified services are encountered or where there is a risk of damage to existing infrastructure.
Safety Observer	The Safety Observer is responsible for: • monitoring excavation activities for hazards identified through the risk assessment • maintaining effective communication with the plant operator and other people involved in the work • warning people of actual or potential hazards identified during the work activity • remaining dedicated to Safety Observer duties where required by the risk assessment • monitoring exclusion zones and work areas to ensure controls remain effective • directing excavation work to stop where unsafe conditions are identified or controls can no longer be maintained.
Team members and contractors	Team members and contractors are responsible for: • complying with this procedure and associated excavation documentation • only undertaking excavation activities where trained, competent and authorised • participating in risk assessments, inspections and pre-start briefings as required • complying with permits, SWMS, risk assessments and excavation controls applicable to the work • using plant, equipment and PPE in accordance with training and site requirements • reporting hazards, damaged services, incidents and unsafe conditions • stopping work where it is unsafe to continue • following directions provided by the PICOW, Safety Observer and other authorised persons • advising the Document Owner if this procedure is not consistent with current practices • where possible, minimise printing and/or creating duplicate copies of this procedure. Ensure current versions are sourced from the Document Centre.

4. Planning excavation work

Excavation work must be planned before work starts to ensure hazards are identified, risks are assessed, and appropriate controls are selected and implemented.

Planning activities must be completed before an Excavation Permit is issued.

Planning must consider:

- underground, buried and overhead services
- service locating and proving requirements
- ground conditions and excavation stability
- nearby buildings, structures, roads and infrastructure
- the excavation method and sequence of work
- access and egress arrangements
- environmental and cultural heritage considerations
- traffic management requirements
- spoil placement and stockpiling requirements
- permit and approval requirements
- emergency and rescue arrangements.

Excavation work must be planned in accordance with legislative requirements, including the [Work Health and Safety Regulation 2011](#) (Qld) and the [Excavation work Code of Practice 2021](#).

Where reasonably practicable, excavation work must be planned to eliminate or minimise the need for personnel to enter excavations.

4.1 Information gathering

The Person in Charge of Work (PICOW) must ensure sufficient information is gathered and reviewed before excavation work starts to identify hazards, underground and overhead services, site constraints, adjacent infrastructure, environmental considerations and any other conditions that may affect, or be affected by, the excavation work.

Information gathered during planning may include:

- Before You Dig Australia (BYDA) information
- construction drawings and as-constructed records
- easement maps
- service plans and line diagrams
- survey data
- service specifications and asset information
- surface markers and utility identification systems
- information relating to overhead services
- information relating to nearby buildings, structures and infrastructure
- information relating to ground conditions, groundwater and previously disturbed ground

- geotechnical assessments and reports
- third-party access requirements and restrictions
- regulatory requirements and notifications
- stockpiling locations for excavated material and topsoil
- disposal locations for excavated material
- transportation requirements associated with the excavation work.

Information gathered during planning must be reviewed and used to determine excavation methods, risk controls, permit requirements, emergency arrangements and any additional assessments required for the work.

4.2 Service identification and location

Underground and overhead services, utility installations, obstructions and other hazards within the work area must be identified, located and protected before excavation work starts.

Service identification and location activities must be undertaken in accordance with the [Excavation work Code of Practice 2021](#).

The PICOW must ensure a current [Before You Dig Australia](#) (BYDA) enquiry has been obtained and reviewed, together with drawings, service records and other available information, before excavation work starts.

Where excavation work is undertaken in the vicinity of Seqwater assets or trunk water mains, the requirements of [Pr11015](#) - Working in the Vicinity of Seqwater Assets Procedure and any required consent approvals must be complied with.

Excavation work must not proceed across, under or in close proximity to a trunk water main unless required approvals and controls have been implemented.

Underground services must be identified, appropriately marked and protected before excavation work starts.

Overhead services must be identified and appropriate controls implemented where excavation work has the potential to encroach on exclusion zones or required approach distances.

Service location information obtained from BYDA, drawings and service records must be verified before mechanical excavation proceeds.

Where the location of underground services cannot be positively confirmed, service proving must be undertaken using suitable methods such as potholing, vacuum excavation, hydro excavation or other non-destructive excavation methods.

BYDA information, drawings and service records must not be relied upon as the sole means of determining the location of underground services.

Where unidentified services are encountered, or the location of existing services cannot be confirmed, excavation work must cease and the requirements of Section 5.14 Stop work requirements must be followed.

Where underground services are identified and marked, service identification markings and underground marking tape must be applied in accordance with Appendix A: Underground Marking Tape and the requirements of AS 5488 Classification of Subsurface Utility Information.

4.3 Coordination and notifications

Affected parties must be notified before excavation work commences, where the work has the potential to impact people, services, infrastructure or operations.

Affected parties may include:

- affected Unitywater teams and facilities
- regulatory authorities
- service providers and utility owners
- property owners or occupiers
- other stakeholders.

The PICOW must ensure communication and coordination arrangements are established before excavation work starts.

Information communicated to affected parties may include:

- the location and scope of the excavation work
- planned start and finish dates
- impacts to services or operations
- access restrictions
- traffic management arrangements
- emergency contact details
- any other information relevant to the safe coordination of the work.

Communication and coordination arrangements must remain effective for the duration of the excavation work and be reviewed where work activities, site conditions or affected parties change.

4.4 Approvals and authorisations

The PICOW must ensure all required approvals and authorisations are identified and obtained before excavation work starts.

Approvals and authorisations may include:

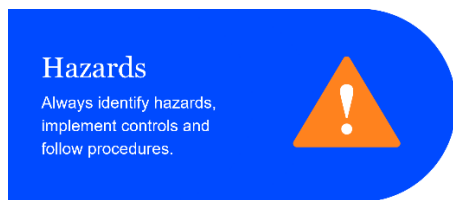
- utility owner approvals
- regulatory notifications and approvals
- traffic management approvals
- landowner approvals
- environmental approvals
- site-specific permits, approvals or authorisations.

Excavation work must not start until all required approvals and authorisations have been obtained and any associated conditions have been implemented.

4.5 Risk assessment requirements

An on-the-job risk assessment must be completed before excavation work starts to identify hazards, assess risks and determine appropriate controls.

Risk assessments must be completed in accordance with [Pr9306](#) - Risk Management Procedure and the Unitywater Life Saver Hazards.



The risk assessment must consider all hazards associated with the excavation work, including:

- underground, buried and concealed services
- overhead services
- ground conditions and excavation stability
- previously disturbed, filled or backfilled ground
- groundwater and surface water ingress
- adjacent structures, roads and infrastructure
- hazardous atmospheres
- interaction with mobile plant, traffic and pedestrians
- vibration from roads, railways, plant or other activities
- environmental and cultural heritage impacts
- emergency and rescue arrangements.

The risk assessment must be reviewed and updated when:

- site conditions change
- new hazards are identified
- controls are no longer effective
- the scope of work changes
- an incident, near miss or service strike occurs.

4.6 Safe Work Method Statement (SWMS) requirements

A Safe work method statement (SWMS) must be prepared and implemented for excavation work that involves high risk construction work (HRCW) in accordance with the *Work Health and Safety Regulation 2011* (Qld).

Excavation activities that may be classified as high risk construction work (HRCW) include:

- excavation work involving a trench or shaft greater than 1.5 metres deep
- work near energised electrical installations or services
- work on or near pressurised gas mains or piping
- work on or adjacent to roads, railways or other areas with moving traffic
- work in or near a confined space
- work involving the risk of a person falling more than two (2) metres.

SWMS must be developed and implemented in accordance with [Pr9306](#) - Risk Management Procedure and the *Work Health and Safety Regulation 2011* (Qld).

SWMS must be reviewed and updated when:

- the scope of work changes
- site conditions change
- new hazards are identified
- control measures are no longer effective
- an incident, near miss or service strike occurs.

Where excavation work is undertaken by contractors, contractor SWMS must be reviewed and accepted before work commences.

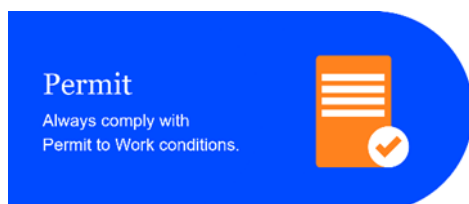
4.7 Permit requirements

An Excavation Permit is required for:

- any excavation greater than 300 mm in depth
- any work involving mechanical excavation equipment (e.g. excavators)
- any work requiring access beneath existing concrete or road surfaces.

The purpose of the Excavation Permit is to ensure excavation work is planned, risk assessed, authorised and controlled to minimise risks to people, property, infrastructure and the environment.

Excavation Permits must be obtained, authorised and managed in accordance with [Pr8996](#) - Permit to Work Procedure and the Unitywater Life Saver **Permit**.



The Excavation Permit must remain valid and available at the work site for the duration of the excavation work.

Work must stop if:

- the scope of work changes
- site conditions change
- new hazards are identified
- control measures are no longer effective
- permit conditions can no longer be met.

The Excavation Permit must be reviewed and revalidated before excavation work resumes.

4.7.1 Other permit requirements

Excavation work may require additional permits, approvals or authorisations depending on the nature of the work, location and associated hazards.

Where excavation work is undertaken at the same time as, or interfaces with, other high risk work activities, the associated hazards and interactions must be identified, assessed and controlled before work starts and for the duration of the work.

Additional permits and approvals may include:

- Confined Space Entry Permit
- Hot Work Permit
- Work at Height Permit
- isolation authorisations
- road corridor permits
- traffic management approvals
- Network, Wamuran Irrigation Scheme (WIS), or Wastewater Treatment Plant (WWTP) work permits.

Where multiple permits are required, they must be coordinated and managed together to ensure controls remain effective and permit conditions are met.

All required permits, approvals and authorisations must be obtained before work starts.

4.8 Traffic management requirements

Traffic management controls must be implemented where excavation work has the potential to impact vehicle movements, pedestrian movements or public access.

Traffic management activities must be undertaken in accordance with [Pr8193](#) - Working Near Roads or Railways Procedure.

The PICOW must ensure traffic management requirements identified during planning are implemented before excavation work starts.

Traffic management controls may include, but are not limited to:

- traffic guidance schemes
- exclusion zones
- road occupancy permits
- temporary barriers and signage
- detours
- pedestrian management arrangements
- traffic controllers.

Traffic management controls must remain in place and effective for the duration of the work.

Traffic management arrangements must be reviewed when:

- work activities change
- traffic conditions change
- site conditions change
- identified controls are no longer effective.

Where changes are required, traffic management controls must be updated before work continues.

4.9 Excavation stability planning

Excavation work must be planned to prevent ground collapse and protect people from the risk of engulfment, entrapment or injury caused by excavation failure.

Excavation activities must be planned and undertaken in accordance with the [Excavation work Code of Practice 2021](#) and the Unitywater Life Saver **Excavation**.



Before excavation work starts, ground conditions and excavation stability must be assessed and documented where required to determine:

- the excavation method
- excavation support requirements
- access and egress arrangements
- controls required to prevent ground collapse
- whether additional engineering or geotechnical assessment is required.

4.9.1 Ground conditions

Ground conditions must be assessed before excavation work commences and reassessed where conditions change. The assessment of ground conditions must consider, where applicable:

- the type and condition of the soil or material being excavated
- previous excavations, disturbed ground, filled ground or backfilled areas
- groundwater and surface water conditions
- soil saturation
- weather conditions
- nearby watercourses, drains or runoff
- excavation depth and geometry
- adjacent buildings, structures and infrastructure
- trees, root systems and other vegetation that may influence excavation stability
- underground services
- imposed loads, surcharge loads and the location of spoil, plant and equipment adjacent to the excavation
- vibration from roads, railways, mobile plant or other nearby activities.

The assessment must be reviewed if ground conditions change or signs of instability are identified.

The assessment of ground conditions must be used to determine appropriate excavation methods and ground collapse control measures.

4.9.2 Geotechnical assessment requirements

A geotechnical assessment must be considered where excavation depth, soil type, groundwater conditions, vibration, adjacent structures, surcharge loading or other site conditions may affect excavation stability.

The need for a geotechnical assessment must be determined through the planning and risk assessment process.

Where recommendations are provided through a geotechnical assessment, they must be implemented before excavation work starts.

4.9.3 Adjacent structures and infrastructure

The potential impact of excavation activities on adjacent buildings, structures, roads, retaining walls, buried infrastructure and services must be assessed before excavation work starts.

Where excavation work may affect the stability or integrity of adjacent structures, appropriate controls must be implemented to prevent movement, settlement, collapse or damage.

Where identified through the risk assessment, engineering assessment or planning process, dilapidation surveys, structural monitoring, temporary supports or other controls must be implemented before excavation work starts and maintained for the duration of the work.

Where required, a suitably qualified person must assess the risks and specify appropriate controls.

4.9.4 Ground collapse controls

Ground collapse control measures must be selected and implemented based on the excavation depth, ground conditions, surrounding environment and risks identified through the risk assessment.

Ground collapse control measures must protect people from the risk of engulfment, entrapment or injury resulting from excavation instability or ground collapse.

Personnel must not enter a trench or excavation greater than 1.5 m deep unless the risk of ground collapse has been controlled through benching, battering, an excavation support system, or other control verified by a suitably qualified person.

Ground collapse control measures may include:

- benching or battering, where ground conditions are suitable and sufficient space is available
- excavation support systems
- dewatering
- exclusion zones
- edge protection and temporary fencing
- other engineered controls.

Ground collapse controls must be in place before people enter the excavation.

Ground collapse controls must be implemented in accordance with the [Excavation work Code of Practice 2021](#).

Where engineering controls are required to maintain excavation stability, they must be designed, approved or verified by a suitably qualified person.

4.9.4.1 Benching and battering

Benching and battering may be used where ground conditions are suitable and sufficient space is available to safely modify the excavation profile.

The suitability of benching or battering must be determined through the risk assessment and consideration of:

- ground conditions
- excavation depth
- groundwater conditions
- adjacent structures and services
- surcharge loads
- available work area.

Benching and battering must be designed and implemented in accordance with the [Excavation work Code of Practice 2021](#).

Where ground conditions are unstable, space constraints exist, or benching and battering cannot provide an adequate level of protection, excavation support systems must be used.

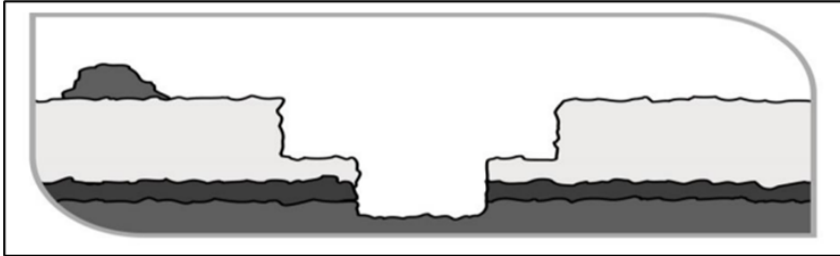


Figure 1: Benching example

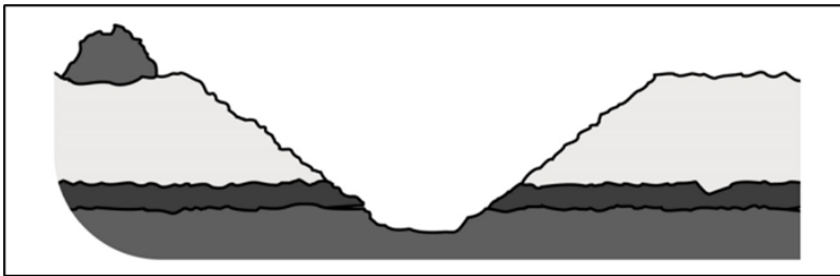


Figure 2: Battering example

4.9.4.2 Excavation support systems

Excavation support systems must be used where there is a risk of ground collapse and benching or battering is not reasonably practicable, or cannot provide an adequate level of protection.

Excavation support systems may include:

- shoring systems
- trench shields (also known as trench boxes)
- hydraulic support systems
- other engineered excavation support systems.

Excavation support systems may perform different functions.

Shoring systems are designed to support excavation walls and minimise ground movement or collapse.

Trench shields, also known as trench boxes, are designed to provide a protected work area for people within an excavation and do not necessarily prevent ground movement or collapse.

The suitability of any excavation support system must be determined by a competent person having regard to the excavation depth, excavation dimensions, ground conditions, groundwater conditions, surcharge loads, adjacent structures and the work being undertaken.

Excavation support systems must:

- be selected by a competent person and be suitable for the excavation depth, ground conditions and work activity
- be verified as complete and suitable before use
- be installed, used and maintained in accordance with manufacturer requirements
- be inspected by a competent person before people enter the excavation and following any event or change in conditions that may affect their effectiveness
- be removed from service if damaged, defective or no longer fit for purpose
- be used within manufacturer specified design limitations
- only be lifted using designated lifting points and approved lifting equipment.

People must not enter an unsupported excavation to install, assemble, adjust or remove an excavation support system.

Excavation support systems must be assembled outside the excavation wherever reasonably practicable and lowered into position using suitable lifting plant and equipment.

Excavation support systems must be installed, repositioned and removed using methods that do not expose people to:

- ground collapse
- falling objects
- suspended loads
- mobile plant hazards.

Exclusion zones must be established and maintained during the installation, repositioning and removal of excavation support systems.

People must not work outside the protection provided by an excavation support system where the system is required to control the risk of ground collapse.

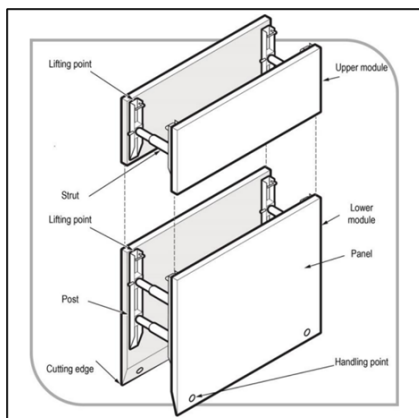


Figure 3: Trench shield

4.10 Excavation entry requirements

People must not enter an excavation until:

- underground services have been identified and protected
- ground conditions have been assessed
- required ground collapse controls have been implemented
- excavation support systems have been inspected where required
- safe access and egress has been provided
- atmospheric hazards have been assessed where required
- emergency and rescue arrangements have been established
- required inspections have been completed.

4.11 Pre-start briefing

The PICOW must conduct, or ensure a pre-start briefing is conducted, before excavation work starts.

The pre-start briefing must ensure everyone involved understands:

- the scope of work
- roles and responsibilities
- identified hazards and risks
- control measures
- permit requirements
- excavation methodology and sequence of work
- ground conditions and excavation stability requirements
- ground collapse prevention controls
- location, identification and protection of underground and overhead services
- traffic management arrangements
- emergency and rescue arrangements
- stop work requirements
- site-specific conditions and constraints.

Where applicable, the pre-start briefing must include a review of the:

- competency, authorisation and verification requirements applicable to the work activity
- risk assessment
- Safe Work Method Statement (SWMS)
- Excavation Permit
- other permits, approvals or authorisations associated with the work.

Additional briefings must be undertaken where:

- the scope of work changes
- site conditions change
- new hazards are identified
- control measures are modified
- personnel changes occur that may affect the safe execution of the work
- following any unplanned event, near miss or service strike.

People involved in the work must be provided with an opportunity to ask questions and clarify requirements before work starts.

5. Conducting excavation work

5.1 General requirements

Excavation work must be undertaken in accordance with the [Excavation work Code of Practice 2021](#), this procedure, applicable permits, risk assessments and Safe Work Method Statements (SWMS).

Excavation activities may interface with other high-risk work activities and associated critical risk controls. Where excavation work involves, or has the potential to involve, other high-risk work activities, the requirements of the relevant Unitywater procedures must also be complied with.

This may include:

- confined space work
- hot work
- lifting operations
- work at heights
- isolation activities.

Where an excavation meets the definition of a confined space, the requirements of [Pr8174](#) - Confined Space Procedure must be complied with.

Where hot work is undertaken as part of excavation activities, the requirements of [Pr11485](#) - Hot Works Procedure must be complied with.

Where lifting operations are undertaken as part of excavation activities, the requirements of [Pr11312](#) - Lifting Procedure must be complied with.

Where excavation work creates a risk of a person falling into an excavation, appropriate fall prevention or fall protection controls must be implemented in accordance with [Pr8191](#) - Working at Height Procedure.

Where isolation of an energy source is required, the requirements of [Pr8182](#) - Isolation – Lock Out Tag Out (LOTO) Procedure must be complied with.

Tools, equipment and materials must be stored so they cannot fall into the excavation or create instability.

5.2 Environmental and cultural heritage requirements

Environmental and cultural heritage risks associated with excavation work must be identified, assessed and managed before work starts and for the duration of the excavation activity.

Excavation work must be undertaken in accordance with [Pr9305](#) - Environmental Field Guide Construction and Maintenance.

Where excavation work has the potential to impact environmentally sensitive areas, protected flora or fauna, waterways, contaminated land or areas of cultural significance, appropriate controls must be implemented before work starts.

Environmental controls must remain effective for the duration of the work and be reviewed when site conditions change or additional environmental risks are identified.

Where required, excavation activities must also be undertaken in accordance with:

- [Pr10721](#) - Vegetation Management Procedure
- [Pr10722](#) - Wildlife Interactions Procedure
- [Pr10723](#) - Slurry Management Procedure
- [Pr11279](#) - Management of Contaminated Land Framework.

5.3 Inspection requirements

The PICOW must ensure excavations are inspected to confirm excavation stability, verify the effectiveness of control measures and identify conditions that may affect the safety of the work.

Inspection and testing may be required to assess:

- ground conditions and excavation stability
- the effectiveness of ground collapse prevention controls
- the presence of hazardous atmospheres, contaminants or gases
- the condition of adjacent structures, roadways and surrounding areas.

Signs of excavation instability may include:

- cracks or fissures in the ground
- sloughing or collapsing trench walls
- undercutting
- bulging or heaving
- earth fretting
- slipping
- slumping
- swelling
- water seepage or water ingress
- ground movement
- movement of adjacent structures or services
- displacement or damage to excavation support systems.

Excavations must be inspected:

- before the start of each shift
- after rainfall or other environmental conditions that may affect excavation stability
- following water ingress or flooding
- when cracks, fissures, sloughing, undercutting, water seepage, bulging or other signs of ground movement are identified
- when there are signs of movement or instability in adjacent structures, roads, services or infrastructure
- following any event or change in conditions that may affect excavation safety
- following the installation, removal or modification of excavation support systems.
- excavation conditions must be monitored throughout the work and reassessed where changing conditions may affect excavation stability or the effectiveness of controls.

Where excavation support systems are in use, inspections must confirm the systems:

- remain correctly installed
- remain effective and fit for purpose
- are free from damage, defects, excessive wear or deterioration
- have not been displaced, altered or affected by changing site conditions.

Inspections must also confirm that:

- access and egress arrangements remain safe and unobstructed
- barricades and exclusion zones remain effective
- control measures identified through the risk assessment remain in place.

Inspection outcomes must be recorded where required.

Excavation work must not start, or if already started must stop, where inspections identify conditions that may compromise excavation stability or present an unacceptable risk to people, the public, infrastructure or the environment.

5.4 Access and egress

Access to and egress from excavations must be provided where people are required to enter the excavation.

Access and egress arrangements must be determined through the risk assessment process and provided in accordance with applicable legislation, standards and codes of practice.

Access and egress must:

- provide safe entry to and exit from the excavation
- be maintained in a safe condition for the duration of the work
- be kept clear of obstructions at all times
- enable the timely evacuation of people in an emergency.

Ladders, stairs, ramps or other access systems used to enter an excavation must be suitable for the task and secured where necessary to prevent movement or displacement.

People must not step, jump or climb across excavations. Appropriate access systems must be provided where access across an excavation is required.

Access points must be positioned so people are not required to travel excessive distances within an excavation to reach a safe exit.

Where trenches are occupied by people, ladders, stairs, ramps or other suitable access systems must be provided at intervals not exceeding nine (9) metres along the trench.

Access and egress arrangements must be reviewed when:

- excavation conditions change
- excavation dimensions change
- access routes become obstructed
- changes are made to the work activity that may affect emergency evacuation.

People must not enter an excavation where safe access and egress has not been provided.

5.5 Signage, barricades and exclusion zones

Suitable barriers, barricades, exclusion zones and warning signs must be installed where there is a risk of injury to people, damage to plant or equipment, or unauthorised access to the excavation area.

Barricades must be selected, installed and maintained in accordance with [Pr11417](#) - Barricading Requirements Guide.

The type, location and extent of barriers, barricades, exclusion zones and warning signs must be determined through the risk assessment and consider:

- the size and depth of the excavation
- the location of the excavation
- vehicle and pedestrian movements
- work activities being undertaken
- the proximity of people involved in the work, members of the public, mobile plant and vehicles.

The location and extent of exclusion zones must be communicated and documented through the risk assessment, permit or other applicable excavation documentation.

Exclusion zones must be established and maintained to prevent people from entering areas where they may be exposed to excavation hazards, mobile plant movements, falling objects or ground collapse.

Barriers, barricades, exclusion zones and warning signs must be maintained for the duration of the work and reviewed when site conditions change.

Open excavations must be secured when left unattended to prevent unauthorised access and protect people involved in the work, the public, mobile plant and vehicles from excavation hazards.

Where there is a risk of a person falling into an excavation, or unauthorised access to the excavation, suitable edge protection, barricades or temporary fencing must be installed.

Temporary fencing and edge protection must be positioned at least one (1) metre from the live edge of the excavation wherever reasonably practicable.

Where edge protection is installed, it must include:

- a bottom rail positioned not less than 150 mm and not more than 250 mm above the working surface, or
- a toe board at least 150 mm high fitted below all rails.

Where work is undertaken on surfaces with slopes greater than 26 degrees, sturdy mesh, sheeting or equivalent protection extending at least 900 mm above the working surface must be provided.

5.6 Lighting

Adequate lighting must be provided where excavation work is undertaken during periods of low visibility or where natural lighting is insufficient to safely undertake the work.

Lighting must provide sufficient illumination of:

- the excavation work area
- access and egress points
- pedestrian and vehicle pathways
- barriers, barricades and warning signs
- plant operating areas
- any other area identified through the risk assessment.

Lighting must be positioned and maintained so it does not create additional hazards, including glare, shadows or reduced visibility for people operating plant or vehicles.

Lighting must remain effective for the duration of the work and be reviewed when site conditions or work activities change.

5.7 Safety observer requirements

A Safety Observer must be used where identified through the risk assessment or where there is a risk of:

- contact between mobile plant and underground services
- contact between mobile plant and overhead services
- contact between mobile plant and people
- damage to surrounding infrastructure or assets
- reduced visibility of the work area by the plant operator.

The Safety Observer must be positioned to effectively monitor the work activity and maintain communication with the plant operator and other affected persons.

The Safety Observer must remain dedicated to the role and must not undertake any other task that may affect their ability to effectively monitor the activity.

Where mobile plant is operating adjacent to an occupied excavation, the Safety Observer must monitor excavation conditions and warn affected people of any indication of instability or unsafe conditions.

Where a Safety Observer identifies an unsafe condition, excavation work must cease and the requirements of Section 5.14 Stop work requirements must be followed.

5.8 Working around mobile plant

Where mobile plant is used during excavation work, controls must be implemented to prevent injury to people, damage to infrastructure, and contact with underground or overhead services.

Mobile plant activities must be undertaken in accordance with the [Managing the Risks of Plant in the Workplace Code of Practice 2021](#).

An effective communication system based on two-way acknowledgement must be established between mobile plant operators and ground personnel before work starts.

Where mobile plant operators do not have a clear view of the work area, a Safety Observer or other competent person must be used to maintain communication and direct plant movements in accordance with Section 5.7 Safety observer requirements.

People working in the vicinity of mobile plant must wear high visibility clothing in accordance with [Pr8185 - Personal Protective Equipment – PPE - Procedure](#).

Exclusion zones must be established and maintained to separate people from mobile plant operating areas.

People must remain outside mobile plant exclusion zones unless the activity has been risk assessed and appropriate controls have been implemented.

People must remain clear of plant operating envelopes, swing areas and blind spots unless the activity has been risk assessed and appropriate controls are in place.

People must leave the excavation where mobile plant approaches and there is a risk of struck-by injury, falling material, engulfment or excavation collapse.

People must remain clear of loading, unloading and spoil placement areas while plant is operating.

Mobile plant operators must stop work if:

- communication is lost
- visibility is compromised
- people enter the exclusion zone
- an unsafe condition is identified.

Mobile plant, materials and equipment must be positioned and operated so they do not adversely affect excavation stability or increase the risk of ground collapse.

Mobile plant must be operated at a safe distance from excavation edges unless controls have been implemented to manage the risk of ground collapse or plant rollover.

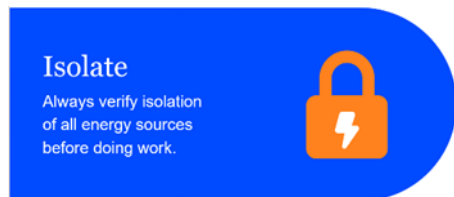
Large earthmoving equipment must not be operated adjacent to unsupported excavation edges where there is a risk of ground collapse or plant rollover.

Vehicles, generators, pumps and other engine-driven equipment must be positioned and operated so they do not expose people to exhaust emissions or create additional excavation hazards.

Where mobile plant is used for lifting activities, the requirements of [Pr11312](#) - Lifting Procedure must also be complied with.

5.9 Working near electrical apparatus

Excavation work near electrical apparatus must be undertaken in accordance with [Pr9743](#) - Electrical Safety Procedure, the [Working near overhead and underground electric lines Code of Practice 2010](#), and the Unitywater Life Saver **Isolate**.



Underground and overhead electrical assets must be identified before excavation work starts in accordance with Section 4.2 Service identification and location.

Appropriate controls must be implemented where excavation work is undertaken near electrical apparatus.

Where the location of electrical apparatus cannot be positively confirmed, additional controls must be implemented before excavation work proceeds.

People, plant and equipment must not enter electrical exclusion zones unless authorised and approved controls have been implemented.

If unidentified electrical services are encountered, electrical infrastructure is damaged, or there is an immediate risk of contact with electrical apparatus, work must stop and the requirements of Section 5.14 Stop work requirements must be followed.

5.10 Spoil placement and stockpiling

Excavated material, spoil and stockpiles must be managed to prevent injury to people, ground instability, environmental harm and impacts to surrounding infrastructure.

The location of spoil stockpiles, delivery areas and material laydown areas must be determined during planning and considered during the risk assessment process.

Excavated material, spoil, plant, equipment and other materials must be positioned at least one (1) metre from the edge of the excavation unless an alternative control has been identified through a risk assessment, engineering assessment or engineered excavation support system.

Spoil stockpiles, plant and materials must be positioned so they do not create a surcharge load that could affect excavation stability.

Spoil stockpiles must not:

- obstruct access and egress
- encroach on exclusion zones
- create hazards for the people involved in the work, pedestrians or vehicles
- obstruct drainage paths or waterways
- adversely impact environmentally sensitive areas.

Spoil, loose material and debris must be managed so they cannot fall into the excavation or create a hazard for people below.

Where required, controls must be implemented to prevent:

- erosion
- sediment run-off
- dust generation
- movement of stockpiled material.

Spoil placement and stockpiling activities must be undertaken in accordance with [Pr9305](#) - Environmental Field Guide Construction and Maintenance.

5.11 Backfilling and restoration

Backfilling activities must be undertaken in a manner that maintains the integrity of the excavation, surrounding infrastructure and affected services.

Before backfilling starts, consideration must be given to:

- the type and condition of the excavated material
- service locations and protection requirements
- manufacturer and asset owner requirements
- compaction requirements
- drainage requirements
- environmental controls
- reinstatement requirements for roads, pathways, structures and surrounding areas.

Backfilling materials must be suitable for the intended purpose and placed in a manner that does not damage underground services, structures or infrastructure.

Where services have been exposed during excavation activities, appropriate controls must be implemented to prevent damage during backfilling.

People must be clear of the excavation before backfilling activities commence.

The excavation area must be restored to a condition that is safe and suitable for its intended use.

Where applicable, restoration activities must be completed in accordance with asset owner requirements, construction specifications and permit conditions.

5.12 Dewatering

Dewatering activities must be undertaken in accordance with [Pr10635](#) - Dewatering Work Instruction, the [Excavation work Code of Practice 2021](#) and applicable environmental requirements.

The need for dewatering must be assessed where:

- groundwater is present
- water is accumulating within the excavation
- runoff may enter the excavation
- saturated ground conditions may affect excavation stability
- water may adversely affect nearby structures, roads or services.

Dewatering systems must be selected and managed to:

- maintain excavation stability
- prevent erosion and sediment transport
- minimise environmental harm
- prevent impacts to neighbouring properties or infrastructure.

Discharge from dewatering activities must be managed in accordance with [Pr9305](#) - Environmental Field Guide Construction and Maintenance, site-specific environmental controls and [Pr10635](#) - Dewatering Work Instruction.

Dewatering activities must be monitored throughout the work and reviewed where conditions change or where water ingress increases the risk of excavation instability.

Where dewatering controls are no longer effective, work must stop and the requirements of Section 5.14 Stop work requirements must be followed.

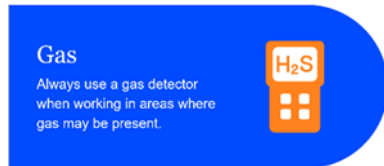
5.13 Atmospheric hazards

Atmospheric hazards must be considered where people are required to enter an excavation.

Atmospheric monitoring must be undertaken where identified through the risk assessment, including where:

- sewer infrastructure or assets are present
- contaminated land is present
- gas infrastructure is present
- natural ventilation may be restricted
- hazardous gases, vapours or contaminants may be present
- the excavation is a shaft, tunnel or other deep excavation.

Where atmospheric monitoring is required, it must be undertaken in accordance with [Pr11416](#) - Portable Gas Detection Procedure and the Unitywater Life Saver **Gas**.



Gas detection equipment used for excavation activities must be suitable for the hazards present and used in accordance with manufacturer requirements and training.

Atmospheric conditions must be reassessed where work activities, site conditions, ventilation conditions or environmental conditions change.

Vehicles, generators, pumps and other engine-driven equipment must not be operated where exhaust emissions may accumulate within an excavation occupied by people.

Where natural ventilation is insufficient, mechanical ventilation must be provided to control airborne contaminants and maintain a safe working environment.

Potential ignition sources must be controlled where there is a risk of flammable gases, vapours or atmospheres being present.

People must not enter or remain in an excavation where a hazardous atmosphere is present or suspected.

Where a hazardous atmosphere is identified or suspected, work must stop, the area must be isolated, and site emergency arrangements must be implemented.

5.14 Stop work requirements

Excavation work must stop immediately where conditions arise that may compromise the safety of people, the public, infrastructure or the environment.

Stop work triggers include, but are not limited to:

- signs of ground movement, instability or collapse
- failure, displacement or damage to excavation support systems
- unexpected changes in ground conditions
- water ingress that may affect excavation stability
- a hazardous or flammable atmosphere is detected or suspected
- unidentified underground services are encountered
- damage to underground services or infrastructure
- damage to electrical apparatus or exposure of unidentified electrical services
- environmental conditions that create an unacceptable risk
- permit conditions can no longer be met
- unauthorised people entering the excavation or exclusion zone
- a new hazard is identified that has not been assessed and controlled.

Where excavation work is stopped, the work area must be made safe and access restricted until hazards have been assessed and appropriate controls implemented.

Excavation work must not resume until hazards have been reassessed and appropriate controls have been implemented.

Incidents, hazards and damage to services must be reported in accordance with [Pr8202](#) - Incident Reporting and Notification Procedure.

6. Emergency procedures

Emergency situations associated with excavation work must be planned for and managed before and during excavation activities.

The PICOW must ensure emergency response and rescue arrangements are established and communicated to people involved in the work before excavation work starts.

Emergency arrangements must consider:

- excavation collapse
- service strikes
- hazardous atmospheres
- water ingress and flooding
- interaction with mobile plant
- emergency access and egress
- emergency rescue arrangements
- site-specific hazards.

Where an emergency occurs, people involved in the work must:

- stop work immediately
- raise the alarm and notify affected people
- implement site emergency arrangements
- follow any emergency response, rescue or evacuation requirements applicable to the emergency.

People involved in excavation activities must understand the emergency arrangements applicable to the work.

Emergency incidents and events must be reported in accordance with [Pr8202](#) - Incident Reporting and Notification Procedure.

Where excavation work is undertaken at a Unitywater facility with site-specific emergency arrangements, those arrangements must also be complied with.

6.1 Emergency rescue arrangements

Emergency rescue arrangements must be established before people enter an excavation.

Rescue equipment identified through the risk assessment must be available, accessible and fit for purpose.

Where confined space work is undertaken within an excavation, or where people are required to enter excavations greater than two (2) metres deep, rescue equipment must be attached to the excavation support system where practicable, or otherwise positioned so it is immediately accessible for emergency use.

People involved in the excavation work must be familiar with the rescue arrangements applicable to the work.

Emergency services must not be relied upon as the sole rescue control.

6.2 Excavation collapse

An excavation collapse, or suspected excavation collapse, must be treated as an emergency.

People must not enter a collapsed or unstable excavation to attempt a rescue unless they are appropriately trained, authorised and it is safe to do so.

Where a person is trapped, injured or missing following an excavation collapse, emergency services must be contacted immediately.

Additional excavation work, movement of plant, removal of material or alteration of excavation support systems must not occur until the excavation has been assessed and deemed safe by a competent person.

Excavation work must not resume until the excavation has been assessed as safe and appropriate controls have been implemented.

Excavation collapses must be reported and managed in accordance with [Pr8202](#) - Incident Reporting and Notification Procedure.

Certain excavation collapse incidents may be notifiable under the [Work Health and Safety Act 2011 \(Qld\)](#).

6.3 Service strikes

Damage to, or contact with, an underground or overhead service during excavation work must be treated as an emergency.

Where safe to do so, excavation plant and equipment must be moved clear of the affected area and potential ignition sources controlled.

Where a damaged service presents an immediate risk to people's safety, personnel must evacuate the area and move to a safe location.

The relevant asset owner, service provider and other affected stakeholders must be notified as soon as practicable.

People must not attempt to repair, interfere with, or re-energise damaged services unless authorised and competent to do so.

Excavation work must not resume until the affected area has been assessed and confirmed safe by the relevant asset owner or authorised representative.

Service strikes must be reported and managed in accordance with [Pr8202](#) - Incident Reporting and Notification Procedure.

Where the damaged service involves electrical apparatus, gas infrastructure, or telecommunications infrastructure, the requirements of the relevant asset owner must be complied with.

6.4 Emergency evacuation

Where an emergency situation presents an immediate risk to health and safety, people must evacuate the excavation and move to a safe location.

Following evacuation, the excavation area must be isolated and secured to prevent unauthorised access.

People must not re-enter an excavation until:

- the emergency has been resolved
- the excavation has been assessed as safe
- appropriate controls have been implemented.

Emergency incidents and evacuations must be reported and managed in accordance with [Pr8202](#) - Incident Reporting and Notification Procedure.

7. Training and competency

All personnel involved in the planning, supervision, execution and inspection of excavation work must hold the appropriate training, competency, certification, authorisation and Verification of Competency (VOC), where required, to safely undertake the work.

Competency must be relevant to the task, plant, equipment and level of risk associated with the excavation activity and must be maintained in accordance with legislative requirements, applicable Codes of Practice and Unitywater requirements.

Additional training, competency and authorisation requirements may apply depending on the work being undertaken, including activities involving mobile plant, electrical apparatus, confined spaces, lifting operations, work at heights and isolation activities.

Role	Requirement
People involved in excavation activities	People involved in excavation activities must demonstrate competency in: • application of this procedure • risk management processes, including the development and implementation of risk assessments • excavation hazards and controls • service identification and protection requirements • permit requirements applicable to the work • emergency response and stop work requirements • safe participation in excavation activities and associated exclusion zones.

Role	Requirement
PICOW (Person in Charge of Works)	PICOWs must demonstrate competency in: • planning and coordination of excavation activities • service identification and service proving requirements • excavation stability assessment and ground collapse controls • risk assessment processes • permit requirements • implementation and review of Safe Work Method Statements (SWMS) • traffic management requirements • excavation emergency and rescue arrangements.
Mobile Plant Operators	Mobile Plant Operators involved in excavation activities must: • hold the qualifications, licences, certifications and competencies required for the plant being operated • be trained, competent and familiar with the plant and equipment being operated • demonstrate competency relevant to the plant and excavation activity being undertaken. Unitywater Mobile Plant Operators must also: • hold the relevant Verification of Competency (VOC) for the mobile plant being operated • be provided with documented familiarisation where required • meet the requirements of the Unitywater Role Training Matrix. Where excavation work is undertaken near electrical apparatus, Mobile Plant Operators must hold any competencies, authorisations and approvals required by the Pr9743 - Electrical Safety Procedure and applicable electricity network requirements, which may include: • UETDREL006 Work safely in the vicinity of live electrical apparatus as a non-electrical worker • TO911 Introduction to Electrical Network Infrastructure for Authorised Persons • Authorised Person approval issued by Energex (where required).
Safety Observers	Must demonstrate competency in: • hazards associated with the activity being observed • communication methods used during excavation activities • identification of unsafe conditions • exclusion zone monitoring requirements • stop work requirements • the role and responsibilities of a Safety Observer.

8. Recordkeeping

The table below identifies the types of records relating to this documented process and their storage location:

Type of record	Storage location
Excavation permits	In accordance with Pr8996 - Permit to Work Procedure
Risk assessments	In accordance with Pr9306 - Risk Management Procedure
Safe Work Method Statements	In accordance with Pr9306 - Risk Management Procedure
BYDA information, service plans, utility owner information and service proving records	Attached to the Safety Permit per Pr8996 - Permit to Work Procedure
Training, Licences, Certifications and Verification of Competency (VOC) Records	Unitywater team members: - Recorded in Learning & Development Objective folder and/or recorded in Unitywater's Learning Management System. Contractors: - Sitepass
Plant and Equipment Inspection Records	Unitywater plant and equipment: - Maximo Asset Management System (AMS) and/or equipment-specific inspection records Contractors: - Equipment-specific inspection records

9. Definitions

Term	Meaning
Backfilling	The process of placing material into an excavation to restore, support or reinstate the excavation following the completion of excavation activities.
Battering	To form the face, side, or wall of an excavation to an angle, usually less than the natural angle of repose, to prevent ground collapse.
Before You Dig Australia (BYDA)	A referral service that provides information on the location of underground infrastructure and associated asset owner information.
Benching	The horizontal stepping of the face, side or wall of an excavation to improve excavation stability and reduce the risk of ground collapse.
Competent Person	A person who has acquired through training, qualification or experience the knowledge and skills to carry out a specified task safely and correctly.
Earthmoving Machinery	Operator-controlled mobile plant used to excavate, load, transport, compact or spread earth, overburden, rubble, spoil, aggregate or similar material, but does not include a tractor or industrial lift truck.

Term	Meaning
Electrical apparatus	Electrical equipment, systems or infrastructure used for the generation, transmission, distribution or use of electricity, including overhead powerlines, underground electrical cables, transformers, switchgear, substations and associated electrical assets.
Excavation	A trench, shaft, tunnel or other opening created by removing soil, rock or other material from the ground.
Excavation support system	A system used to support an excavation and/or protect personnel from the effects of ground collapse. Excavation support systems include shoring systems, trench shields, trench boxes, hydraulic support systems and other engineered excavation support systems.
Excavation Work	Work involving the creation, modification, maintenance, extension, backfilling or reinstatement of an excavation.
High Risk Construction Work (HRCW)	Has the meaning given in the <i>Work Health and Safety Regulation 2011</i> (Qld).
Person in Charge of Works (PICOW)	The person responsible for planning, coordinating and controlling the work activity and ensuring applicable controls are implemented and maintained.
Safety Observer	A competent person appointed to monitor a work activity, identify hazards and direct work to stop where unsafe conditions arise or controls cannot be maintained.
Service strike	Any damage, contact, disturbance or unintended interference with an underground or overhead service.
Shoring system	A system designed to support excavation walls and minimise ground movement or collapse.
Suitably Qualified Person	A person with appropriate qualifications, skills, knowledge and experience relevant to the design, assessment or verification activity being undertaken.
Surcharge load	Any load applied adjacent to an excavation that may affect excavation stability, including spoil, plant, equipment, materials, structures or traffic loads.
Trench	An excavation where the length exceeds the width and extends below ground level.
Trench shield (AKA trench box)	A protective structure installed within an excavation to provide a protected work area for personnel. Trench shields/boxes do not necessarily prevent ground movement or collapse.
Verification of Competency (VOC)	A documented assessment used to verify a person's ability to safely and competently perform a task or operate plant or equipment.

10. References and resources

Source	Reference
External	Electrical Safety Act 2002 (Qld)
	Electrical Safety Regulation 2013 (Qld)
	Work Health and Safety Act 2011 (Qld)
	Work Health and Safety Regulation 2011 (Qld)
	Excavation work Code of Practice 2021 , WorkSafe QLD
	Managing the Risks of Plant in the Workplace Code of Practice 2021 , WorkSafe QLD
	Working near overhead and underground electric lines Code of Practice 2010 , WorkSafe QLD
	AS 4744.1 Shoring and Trench Lining
	AS 5488 Classification of Subsurface Utility Information
Internal	Before You Dig Australia
	Pr8182 - Isolation – Lock Out Tag Out (LOTO) Procedure
	Pr8185 - Personal Protective Equipment – PPE – Procedure
	Pr8174 - Confined Space Procedure
	Pr8191 - Working at Height Procedure
	Pr8193 - Working Near Roads or Railways Procedure
	Pr8202 - Incident Reporting and Notification Procedure
	Pr8996 - Permit to Work Procedure
	Pr9305 - Environmental Field Guide Construction and Maintenance
	Pr9306 - Risk Management Procedure
	Pr9743 - Electrical Safety Procedure
	Pr10635 - Dewatering Work Instruction
	Pr10721 - Vegetation Management Procedure
	Pr10722 - Wildlife Interactions Procedure
	Pr10723 - Slurry Management Procedure
	Pr11015 - Working in the Vicinity of Seqwater Assets Procedure
	Pr11279 - Management of Contaminated Land Framework
	Pr11312 - Lifting Procedure
	Pr11416 - Portable Gas Detection Procedure
	Pr11417 - Barricading Requirements Guide
	Pr11485 - Hot Works Procedure
	Watercooler resource page: Unitywater Life Savers

11. Appendices

Refer to the following pages.

Appendix A: Underground Marking Tape

This guide applies to excavations on all Unitywater controlled sites and activity to:

- provide information on identifying the different types of underground services
- specify the additional requirements for the use of underground service marking tape.

Underground marking tape guidelines

Underground Service Identification Colours (as identified in AS5488 – Classification of Subsurface Utility information – Table B2 Primary Code and Line Colour).

Utility	Colour
Communications	White (or black when on white background)
Petroleum/Oil	Brown
Electricity	Orange
Fire Service	Red
Gas	Yellow
Water	Blue
Sewer	Cream
Recycled Water	Purple
Storm Water/Drainage	Green
Unidentified Service	Pink

AS/NZS 2648.1-Table 1 Underground Service Identification Colour provides additional notes regarding these markers.

Notes:

1. Identification colours for other underground services should be of a bright colour. Guidance may be obtained from AS 1345:199 “Identification of the contents of pipes, conduits and ducts”, and AS 2700:2011 (reconfirmed 2022) “Colour standards for general purposes”.
2. The use of the colour canary yellow to identify pipelines containing gases is adopted in this Standard, as this is the colour commonly used in Australia to identify gas pipes by gas supply authorities and users. It should be noted, however, that AS 1345 specify a colour of light beige for this purpose being the internationally agreed colour.

Additional Underground Service Marking Tape Requirements (From AS/NZS 2648.1):

Detection	Wire lines or traces may also be located with marker tape to enable easy service detection as well as visual markers to identify service locations.
Tape Width	The minimum nominal width is to be 75mm. Preferred nominal widths are 100mm and 150mm.
Marking	Warning lettering printed in the tape is to be black in colour and of a minimum size of 25mm. The text is to be repeated at intervals of not more than 1m.
Tear Resistance	Longitudinal direction – not less than 3.0 N. Transverse direction – not less than 3.5 N.
Note: Additional requirements in relation to tape properties are included within AS/NZS 2648.1	