

**Location of Underground Services**

Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

**THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THIS PROJECT**

Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.

Full Name:		
Signature:	Title:	Date:

**CLIENT OR PRINCIPAL CONTRACTOR DETAILS**

Client:	SCOPE OF WORKS
Project Name:	
Project Address:	
Project Manager:	
Contact Phone:	
Date Risk Assessment supplied to Project Manager:	



RISK MATRIX									
LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION	HIERARCHY OF CONTROLS	
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE			<b>Elimination</b> Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	<b>Substitution</b> Replace the hazard.	
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Review before work starts.	Isolation Isolate People from the hazard	
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	2M MODERATE	Ensure control measures in place.	<b>Engineering</b> Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	<b>Administrative</b> Change	
								<b>PPE</b>	

  

Risk Rating & Required Action:	
<b>4A</b>	Stop work. The risk is intolerable. Eliminate the hazard or redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or higher-level authorisation is required.
<b>3H</b>	Review and approve additional controls before task starts. Senior supervisor sign-off needed.
<b>2M</b>	Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.
<b>1L</b>	Proceed, following standard operating procedures. Monitor and keep records.

  

Consequence Scale:			
Consequence	People (injury/illness)	Project / Assets	Compliance / Reputation
<b>Catastrophic</b>	Fatality or permanent total disability	project shutdown	Significant regulator intervention; criminal prosecution
<b>Major</b>	Serious injury/illness (hospital > 5 days)	critical delay	Improvement notice; major media coverage
<b>Moderate</b>	Medical-treatment injury; lost-time > 1 day	moderate delay	Minor breach; adverse client comment
<b>Minor</b>	First-aid only, no lost time	negligible delay	Isolated non-conformance
<b>Insignificant</b>	No injury	no schedule impact	Deviation caught and corrected on site

  

**Notes on Hierarchy of Controls:**  
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. **Substitute**
3. **Isolate**
4. **Engineering**
5. **Administrative**
6. **PPE**

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

*aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.*

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
1. WHS Governance, Planning and Design Management	<ul style="list-style-type: none"> <li>Absence of a documented organisational procedure for locating and exposing underground services prior to excavation or intrusive works</li> <li>Poor integration of WHS Act 2011 duties into project planning and design phases, leading to inadequate consideration of underground service risks</li> <li>Design documentation not clearly identifying known or assumed locations of underground services, or not incorporating Dial Before You Dig / Before You Dig Australia (BYDA) data</li> <li>Lack of clear acceptance criteria for accuracy of non-invasive service location, ground penetrating radar (GPR) surveys and subsurface mapping outputs</li> <li>Insufficient consultation between client, principal contractor, designers and utility asset owners regarding underground service information and constraints</li> <li>No formal process to review and incorporate as-built information, historical drawings and utility records into the project risk profile</li> <li>Poor coordination between different contractors performing site investigation, mapping, and civil works, leading to conflicting or outdated information</li> <li>Inadequate planning for potential rerouting of existing underground services, including temporary supply arrangements and isolation strategies</li> <li>Failure to identify and manage cumulative risks where multiple underground utilities and services are co-located (e.g. gas and HV electrical)</li> </ul>	High	<ul style="list-style-type: none"> <li>Develop and implement an organisational Underground Services Management Procedure that aligns with WHS Act 2011, WHS Regulations and relevant Codes of Practice, clearly defining obligations for planning, consultation, information gathering, and verification of services</li> <li>Embed a formal underground services risk assessment process into project initiation and design reviews, including structured consideration of Locate and Expose Existing Services, Non-invasive Service Location, GPR use, Surface Mapping, Rerouting, Portable Locators, and Working Near Utilities And Services</li> <li>Mandate acquisition and use of current BYDA (Dial Before You Dig) information and utility owner records for every project stage where ground disturbance may occur, with clear time-limits for data validity and triggers for re-requesting information</li> <li>Implement a design management requirement that underground service information (known, assumed and unknown) is explicitly shown on design drawings, models and service plans, with risk ratings and accuracy classes clearly indicated</li> <li>Establish governance arrangements that require consultation and coordination meetings between client, principal contractor, designers, utility owners and service locators during planning and prior to work commencing</li> <li>Create a documented system for reviewing and updating underground services information at key project milestones (e.g. pre-tender, pre-construction, post-exposure) to ensure drawings and GIS databases remain current</li> <li>Adopt engineering and design principles that, where reasonably practicable, redesign work to avoid or minimise work near high-risk underground utilities (e.g. rerouting alignments away from HV power or high-pressure gas)</li> <li>Implement a formal change management process so that any proposed rerouting of existing underground services is subject to engineering review, WHS risk assessment, utility owner approval and documented commissioning procedures</li> <li>Require that project risk registers include a dedicated section for underground services, with controls, responsibilities and review dates, and that these risks are regularly reported through WHS governance forums</li> <li>Include specific contractual clauses that allocate responsibilities for underground service location, verification, protection, rerouting and damage management between client, principal contractor, designers and subcontractors</li> </ul>	Medium
2. Information Management, Records	<ul style="list-style-type: none"> <li>Incomplete, inaccurate or outdated service location drawings leading to</li> </ul>	High		Medium

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and Subsurface Data Quality	<p>incorrect assumptions about underground asset positions and depths</p> <ul style="list-style-type: none"> <li>Lack of a centralised system to manage subsurface information from multiple sources (BYDA, as-built drawings, previous surveys, GPR scans, cable locator outputs)</li> <li>Poor control over versions and revisions of underground services plans, increasing the risk that field teams rely on superseded information</li> <li>Insufficient validation or quality assurance of non-invasive service location outputs (e.g. GPR interpretations, cable locator traces, subsurface mapping) before these are accepted as a basis for decision-making</li> <li>Service location reports not being retained, catalogued or linked to specific project locations, preventing future use and lessons learned</li> <li>Inadequate documentation of areas where service location results are uncertain or where 'no service found' has limited confidence</li> <li>Failure to identify and flag high-risk assets (e.g. high-voltage cables, high-pressure gas, fibre backbones) within mapping and GIS systems</li> <li>No formal process for capturing, updating and distributing verified service location information after physical potholing or exposure</li> </ul>		<ul style="list-style-type: none"> <li>Establish a centralised digital information management system (e.g. CDE or GIS platform) for all underground services data, including BYDA responses, historical records, GPR outputs, cable locator logs and subsurface mapping files</li> <li>Implement a documented data quality and validation protocol for non-invasive service location results, requiring sign-off by a competent person (e.g. accredited locator or geophysicist for GPR) before information is issued for planning or construction</li> <li>Introduce strict document and drawing control procedures with unique identifiers, revision control and distribution lists for underground services plans, ensuring only current versions are available in the field</li> <li>Require that all underground services drawings and subsurface maps include metadata on data sources, survey dates, methods used (GPR, cable locator, vacuum excavation), and confidence levels/limitations</li> <li>Mandate recording of all physical exposures (potholing, vacuum excavation) in the central system, including photos, coordinates, depth measurements and asset owner details, and require update of as-built records within defined timeframe</li> <li>Use visual risk coding on plans (e.g. colour grading or symbology) to clearly highlight high-risk utilities and areas with low confidence or unknown service information</li> <li>Develop and implement a procedure for issuing formal 'Information Notices' when critical underground services data is added or changed, ensuring all affected contractors and supervisors are notified</li> <li>Specify minimum record-keeping and retention requirements for underground services information under the organisation's WHS management system, including how data will be archived for future projects at the same site</li> <li>Conduct periodic audits of subsurface information quality, including cross-checking between BYDA data, locator reports, GPR scans and actual exposed conditions</li> </ul>	
3. Competency, Training and Accreditation for Service Location	<ul style="list-style-type: none"> <li>Use of untrained or inexperienced personnel to operate GPR, cable locators or other non-invasive location technologies, resulting in misinterpretation of subsurface conditions</li> <li>Lack of formal competency requirements or accreditation standards for service locators engaged by the organisation</li> </ul>	High	<ul style="list-style-type: none"> <li>Define minimum competency, licensing and accreditation requirements for personnel performing underground service location activities, including recognised industry qualifications for cable locator and GPR operators</li> <li>Implement a training and competency management system that records qualifications, experience, refresher dates and verification of competency (VOC) for all personnel involved in service location, subsurface mapping and related supervision</li> <li>Provide targeted training to project managers, engineers and supervisors on interpreting BYDA plans, locator and GPR reports, subsurface maps and as-built drawings, including understanding confidence levels and limitations</li> </ul>	Medium

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	<ul style="list-style-type: none"> <li>Insufficient training for project managers, site supervisors and planners on the limitations of non-invasive service location methods and subsurface mapping</li> <li>Inadequate awareness among workers and managers about legislative duties relating to underground services under the WHS Act 2011 and WHS Regulations</li> <li>No structured training in reading and understanding utility plans, GPR output plots, locator markings, and subsurface mapping products</li> <li>Failure to provide refresher training when new technologies, software or procedures for underground services management are introduced</li> <li>Limited understanding of specific risks associated with working near utilities and services, including electrical induction, gas leaks, fibre damage and communication outages</li> </ul>		<ul style="list-style-type: none"> <li>Deliver WHS Act 2011 and WHS Regulations awareness training that explicitly covers duties relating to underground services, consultation with duty holders, and due diligence obligations for officers</li> <li>Incorporate practical case studies of underground service strikes and near misses into training programs to reinforce the consequences of poor system controls and misinterpretation of non-invasive location data</li> <li>Introduce mandatory induction modules for all site personnel that explain the organisation's Underground Services Management Procedures, including escalation processes when service information is incomplete or conflicting</li> <li>Ensure software-specific training is provided for any digital systems used for GPR interpretation, subsurface mapping, GIS and field mark-up, with access restricted to trained users</li> <li>Establish a periodic refresher and re-assessment regime for service locators and key supervisors, especially when new technologies or standards are adopted</li> <li>Conduct periodic competency audits and verifications (e.g. comparison of predicted vs actual service locations after exposure) to validate the effectiveness of training and competency controls</li> </ul>	
4. Procurement and Management of Service Location Technology and Providers	<ul style="list-style-type: none"> <li>Procurement of low-quality or unsuitable GPR units, cable locators and related equipment that do not meet industry standards or project requirements</li> <li>Engagement of third-party service locators without adequate prequalification, leading to inconsistent quality of non-invasive service location and subsurface mapping</li> <li>Lack of clear technical specifications in procurement documents for service location accuracy, reporting format and deliverables</li> <li>Inadequate maintenance, calibration and verification regimes for GPR, cable locators and other detection equipment</li> <li>Over-reliance on a single technology (e.g. only cable locating) rather than</li> </ul>	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Medium

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	<ul style="list-style-type: none"> <li>using complementary methods (GPR, vacuum excavation) where required</li> <li>Commercial pressure on service locators to minimise time on site, reducing thoroughness of scans and mapping</li> <li>No system to review performance of service location providers, including investigation of incorrect or missed service detections</li> </ul>		[REDACTED]	
5. Systems for Non-invasive Service Location and Ground Penetrating Radar Operation	<ul style="list-style-type: none"> <li>Lack of a standardised process for planning and executing non-invasive service location surveys prior to excavation or drilling</li> <li>Inconsistent application of GPR and cable locator methodologies between sites, leading to variable coverage, scan density and data quality</li> <li>Failure to define survey extents and depths in relation to the proposed work increasing the chance of services being outside the scanned zone</li> <li>Inadequate documentation of survey parameters (e.g. grid spacing, frequencies, gain settings, environmental conditions) making verification and interpretation difficult</li> <li>No formal validation of GPR interpretations (e.g. through sampling or potholing) in critical areas, resulting in unverified subsurface mapping</li> <li>Overconfidence in GPR outputs in ground conditions where GPR performance is known to be limited (e.g. high clay, saturated soils, reinforced concrete)</li> <li>Poor coordination between non-invasive locating activities and subsequent physical exposure works, causing misalignment between marked-up surfaces and actual excavation locations</li> </ul>	High	[REDACTED]	Medium

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6. Management of Physical Exposure, Potholing and Rerouting of Services	<ul style="list-style-type: none"> <li>Inadequate organisational controls around when and how existing services must be physically located and exposed (e.g. potholing) prior to excavation</li> <li>Lack of a formal decision-making process to determine when rerouting of existing underground services is required to reduce WHS risk</li> <li>Poor integration of vacuum excavation and other low-risk exposure methods into standard work planning, leading to greater reliance on mechanical excavation near services</li> <li>Insufficient engineering and WHS review of proposed rerouting designs, including temporary bypasses and connections</li> <li>Weak coordination with utility asset owners when isolation, tie-ins or diversions are required, leading to uncontrolled changes or outages</li> <li>Inadequate management of as-built documentation after rerouting, resulting in outdated records that do not present current underground conditions</li> </ul>	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Medium
7. Supervision, Consultation and Communication for Work Near Utilities and Services	<ul style="list-style-type: none"> <li>Inadequate supervision of work near identified suspected underground services</li> <li>Poor communication of underground service risks and locations to affected workers, subcontractors and visitors</li> <li>Lack of structured consultation mechanisms (e.g. pre-start meetings, toolbox talks) focusing on underground services before and during works</li> <li>Fragmented responsibilities between client, principal contractor and subcontractors for managing the risks of working near utilities and services</li> <li>Failure to communicate changes in service information (e.g. updated plans, newly located assets, rerouted services)</li> </ul>	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Medium

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	<p>to all impacted parties in a timely manner</p> <ul style="list-style-type: none"> <li>Language barriers or literacy issues that prevent some workers from fully understanding service location plans and mapping outputs</li> </ul>		[REDACTED]	
8. Risk Assessment, Permit Systems and Authorisation for Ground Disturbance	<ul style="list-style-type: none"> <li>No formal permit-to-work or ground disturbance authorisation process for activities that may impact underground services</li> <li>Generic or superficial risk assessments that do not specifically evaluate hazards associated with locating, exposing and working near underground utilities and services</li> <li>Failure to re-assess risks when conditions change, such as design modifications, discovery of additional services or changes in work methods</li> <li>Permits and risk assessments not integrating non-invasive location data, GPR outputs and subsurface mapping into the decision-making process</li> <li>Inadequate linkage between high-risk work such as directional drilling, piling or dewatering and underground risk controls</li> </ul>	High	[REDACTED]	Medium
9. Emergency Preparedness, Incident Management and Reporting for Service Strikes	<ul style="list-style-type: none"> <li>Lack of a specific emergency response plan for underground service strikes, such as gas leaks, electrical contact, water main failures or fibre optic damage</li> <li>Workers and supervisors not knowing how to respond immediately and safely to an unplanned service contact or exposure</li> <li>Inadequate arrangements with utility owners and emergency services for rapid response to service strikes or near-miss events</li> <li>Failure to report and investigate service strikes and near misses, resulting in repeated systemic failures</li> </ul>	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> <li>No structured process for learning from incidents and updating procedures, training and designs accordingly</li> </ul>		[REDACTED]	
10. Audit, Review and Continuous Improvement of Underground Services Management	<ul style="list-style-type: none"> <li>No systematic auditing of compliance with underground services procedures, permits and legislative requirements</li> <li>Failure to review the effectiveness of non-invasive service location methods, GPR use, subsurface mapping and rerouting strategies over time</li> <li>Lack of performance indicators for managing underground services risks, making it difficult to assess whether controls are improving safety outcomes</li> <li>Inadequate mechanisms for capturing and sharing lessons learned from different projects and contractors</li> <li>Complacency or normalisation of deviance, where minor strikes or repeated near misses are tolerated without systemic improvements</li> </ul>	Medium	[REDACTED]	Low

SAMPLE

**EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES**

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

**LEGISLATIVE REFERENCES**

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES FOR ANY STATE THAT ARE NOT APPLICABLE

**Queensland & Australian Capital Territory**

Work Health and Safety Act 2011  
 Work Health and Safety Regulations 2011  
 Legislation QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>  
 Codes of Practice QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>  
 Legislation ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations>  
 Codes of Practice ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice>

**Victoria**

Occupational Health and Safety Act 2004  
 Occupational Health and Safety Regulations 2017  
 Legislation VIC: <https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations>  
 Codes of Practice VIC: <https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice>

**New South Wales**

Work Health and Safety Act 2011  
 Work Health and Safety Regulations 2025  
 Legislation NSW: <https://www.safework.nsw.gov.au/legal-obligations/legislation>  
 Codes of Practice NSW: <https://www.safework.nsw.gov.au/resource-library/list-codes-of-practice>

**Western Australia**

Work Health and Safety Act 2020  
 Work Health and Safety Regulations 2022  
 Legislation Western Australia: <https://www.commerce.wa.gov.au/worksafe/legislation>  
 Codes of Practice WA: <https://www.commerce.wa.gov.au/worksafe/codes-practice>

**Northern Territory**

Work Health and Safety (National Uniform Legislation) Act 2011  
 Work Health and Safety (National Uniform Legislation) Regulation 2011  
 Legislation NT: <https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws>  
 Codes of Practice NT: <https://worksafe.nt.gov.au/laws-and-compliance/codes-of-practice>

**Safe Work Australia Links**

Law and Regulation (All States): <https://www.safeworkaustralia.gov.au/law-and-regulation>  
 Model Codes of Practice: <https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice>

**South Australia**

Work Health and Safety Act 2012 (SA)  
 Work Health and Safety Regulations 2012 (SA)  
 Legislation for SA: <https://www.safework.sa.gov.au/resources/legislation>  
 Codes of Practice for SA: <https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs>

**Model Codes of Practice**

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work

**Tasmania**

Work Health and Safety Act 2012  
 Work Health and Safety (Transitional and Consequential Provisions) Act 2012  
 Work Health and Safety Regulations 2012  
 Work Health and Safety (Transitional) Regulations 2012  
 Legislation for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations>  
 Codes of Practice for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice>

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.