

**Culvert And Drainage Installing**

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, Legal Compliance and PCBU Duties	<ul style="list-style-type: none"> <li>Lack of clarity about PCBU, officer and worker duties under the WHS Act 2011 for culvert and tank installation activities</li> <li>Absence of a documented WHS management system specific to civil works, excavation and confined space-related drainage works</li> <li>Inadequate monitoring of compliance with the WHS Act, WHS Regulations and relevant Codes of Practice (Excavation, Confined Spaces, Construction Work)</li> <li>Poor consultation and communication arrangements between principal contractor, subcontractors, designers and utility owners</li> <li>No formal system to verify licences, high-risk work authorisations and construction induction training (white cards)</li> </ul>	High	<ul style="list-style-type: none"> <li>Develop, implement and maintain a documented WHS Management Plan that specifically covers culvert and drainage (including culvert-tank) installation designed with the WHS Act 2011, WHS Regulations and relevant Australian Standards (e.g. AS/NZS 4576 or ISO 45001 framework)</li> <li>Establish a governance structure with clearly defined PCBU and officer accountabilities, including documented WHS roles, responsibilities and designated authorities for managers, supervisors, engineers and contractors</li> <li>Implement a formal legal register capturing WHS legislative requirements, Codes of Practice and key standards relevant to excavation, confined spaces, pits and traffic management, and review it at least annually or when legislative changes</li> <li>Introduce a contractor management procedure requiring prequalification, WHS capability assessment and ongoing performance monitoring of all subcontractors involved in culvert and drainage installation</li> <li>Ensure formal WHS consultation mechanisms (toolbox talks, HSRs, safety committees, pre-start coordination meetings) are in place and recorded, including consultation on changes to design, methodology or sequencing that affect WHS risk</li> <li>Implement a verification of competency (VOC) and licence-checking system before workers undertake high-risk activities (e.g. dogging, rigging, plant operation, confined space work, traffic control)</li> <li>Conduct regular internal WHS audits and management reviews of culvert and drainage projects, tracking corrective actions to close-out with clear timeframes and responsible persons</li> </ul>	Medium
2. Design, Engineering and Constructability Management	<ul style="list-style-type: none"> <li>Culvert, tank and drainage designs that do not adequately address geotechnical conditions, groundwater, surge loads or existing services</li> <li>Lack of formal design risk assessment process (e.g. Safety in Design) leading to latent structural or stability risks during installation and operation</li> <li>Insufficient consideration of constructability, crane access, lifting points and temporary works for culvert-tank installation</li> <li>Failure to design for safe access, egress and inspection for underground tanks, pits and culverts (e.g. confined space considerations)</li> <li>Poor documentation of residual design risks and inadequate communication of these risks to construction and maintenance teams</li> </ul>	High	<ul style="list-style-type: none"> <li>Implement a formal Safety in Design (SiD) procedure requiring designers and engineers to identify, assess and eliminate or minimise WHS risks so far as reasonably practicable at concept and detailed design stages</li> <li>Require geotechnical investigations, service location surveys and hydraulic assessments to inform design of culverts, tanks and associated drainage systems, including allowance for groundwater and flooding scenarios</li> <li>Establish a constructability review process involving construction supervisors, crane specialists and safety advisers to verify that culvert and tank units can be transported, lifted, installed and backfilled safely</li> <li>Specify engineered lifting points, rigging details and temporary bracing or support requirements within design drawings and installation specifications for culvert-tank units</li> <li>Ensure designs incorporate safe access and egress (e.g. ladders, platforms, anchor points) and consider confined space classification, ventilation and rescue access for tanks and large culverts</li> <li>Document residual risks on drawings and in a design risk register, and formally communicate these to site management, supervisors and maintenance personnel through pre-start design briefings</li> <li>Include in design documentation the performance requirements for backfill materials, compaction, traffic loading and long-term settlement to prevent structural failure of culverts, tanks and drainage structures</li> </ul>	Medium

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3. Planning, Approvals and Permit-to-Work Systems	<ul style="list-style-type: none"> <li>Commencing culvert and tank installation works without approved WHS documentation, leading to uncontrolled high-risk construction activities</li> <li>Inadequate project planning, resulting in overlapping work fronts, congestion and conflicting activities (e.g. excavation, craneage, traffic movement) around drainage installations</li> <li>Absence of formal permit-to-work systems for excavation, confined space entry, hot work and live services, creating systemic exposure to catastrophic events</li> <li>Failure to plan for delays due to groundwater, weather, flooding or environmental constraints, leading to rushed or unsafe decisions</li> <li>Poorly managed interface with road authorities, utility owners, rail operators or water authorities regarding approval and isolation requirements</li> </ul>	High	<ul style="list-style-type: none"> <li>Develop a project-specific WHS plan for culvert and drainage works that is approved by senior management and integrated with the construction program before work commences</li> <li>Implement a formal planning process for high-risk construction work (HRCW) that requires documented risk assessments, safe work method statements (SWMS) and engineering plans for culvert-tank installations</li> <li>Introduce a robust permit-to-work system covering excavation, confined space entry, hot work, electrical work and working near underground and essential services with clear authorisation levels and isolation requirements</li> <li>Coordinate with road, rail, water and utility authorities to obtain necessary approvals, isolation plans and access conditions, and embed these requirements in the project schedule and site instructions</li> <li>Use integrated construction planning meetings to sequence excavation, crane operations, traffic management, dewatering and backfilling to reduce interface conflicts and congestion around drainage works</li> <li>Include contingency planning for weather, flooding and groundwater in the project schedule and risk registers with clear triggers for work suspension and re-assessment</li> <li>Ensure all permits and approvals are readily accessible on site (digital or hard copy), audited regularly, and closed out with documented verification when work is completed</li> </ul>	Medium
4. Procurement and Supply Chain Management	<ul style="list-style-type: none"> <li>Procurement of culverts, tanks, pipes and fittings that do not comply with relevant Australian Standards or design specifications</li> <li>Inadequate verification of supplier quality systems for precast units, fabricated tanks and drainage components</li> <li>Poor planning of delivery logistics leading to unsafe on-site handling, double handling or prolonged storage of heavy precast components</li> <li>Lack of traceability and certification for lifting lugs, chains, shackles and other lifting equipment used for culvert-tank installation</li> <li>Inconsistent or missing documentation (e.g. material safety data, installation instructions) from suppliers</li> </ul>	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Low

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			[REDACTED]	
5. Contractor and Subcontractor Management	<ul style="list-style-type: none"> <li>Engaging subcontractors for excavation, craning, traffic control or tank installation without adequate WHS capability or experience</li> <li>Inconsistent WHS standards and procedures between principal contractor and subcontractors leading to confusion and unsafe practices</li> <li>Poor supervision of subcontractor activities around culvert and drainage works, particularly during peak construction periods</li> <li>Lack of clear interface arrangements where multiple contractors share work areas and responsibilities for underground services protection and temporary works</li> <li>Inadequate performance monitoring and failure to address recurring non-conformances in subcontractor WHS performance</li> </ul>	High	[REDACTED]	Medium
6. Competency, Training and Supervision	<ul style="list-style-type: none"> <li>Workers and supervisors lacking specific knowledge of excavation, culvert-tank installation and confined space-related risks</li> <li>Insufficient training in recognising unstable ground conditions, water ingress, and underground services hazards</li> <li>Inadequate supervision of inexperienced workers and labour hire personnel during critical tasks around trenches, pits and tanks</li> <li>No structured verification of competency process for plant operators, doggers, riggers and confined space standby personnel</li> <li>Lack of training on emergency procedures for trench collapse, flooding,</li> </ul>	High	[REDACTED]	Medium

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	hazardous atmosphere or engulfment events		[REDACTED]	
7. Excavation and Ground Stability Management Systems	<ul style="list-style-type: none"> <li>• Systemic failure to assess and control ground conditions before excavating for culverts, tanks and drainage structures</li> <li>• No consistent process for determining when engineered shoring, battering or benching is required for trenches and pits</li> <li>• Inadequate planning for groundwater, stormwater or flooding leading to sudden inundation or loss of ground support</li> <li>• Uncontrolled placement of spoil, plant or materials close to trench edges increasing likelihood of collapse</li> <li>• Reliance on informal visual checks rather than formal inspections and sign-off for deep excavations</li> </ul>	High	[REDACTED]	Medium
8. Underground Services and Utility Coordination	<ul style="list-style-type: none"> <li>• Inadequate systems to locate and manage underground services when installing culverts, tanks and drainage lines</li> <li>• Reliance solely on Dial Before You Dig information without field verification, leading to strikes on gas, power, water or telecommunications</li> <li>• Poor coordination with utility owners regarding isolation, relocation or protection of assets crossing culvert alignments</li> </ul>	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> <li>Lack of consistent procedures for working in easements or corridors congested with multiple services</li> <li>Inadequate recording and communication of newly installed drainage and culvert-tank assets for future works</li> </ul>		[REDACTED]	
9. Plant, Equipment and Lifting Systems	<ul style="list-style-type: none"> <li>Poorly maintained excavators, cranes, lifting gear and compactors used in culvert and tank installation</li> <li>Lack of a systematic approach for selecting appropriate plant and lifting configurations for heavy culvert-tank units</li> <li>Inadequate procedures for plant separation from workers on foot in and around drainage works</li> <li>No formal process for pre-start inspections, defect reporting and removal of unsafe plant from service</li> <li>Unclear responsibility for planning and authorising complex lifts or tandem lifts for large tanks or culvert segments</li> </ul>	High	[REDACTED]	Medium
10. Confined Space and Enclosed Structure Management	<ul style="list-style-type: none"> <li>Failure to identify culvert-tanks, pits, chambers and large culverts as confined spaces or potentially hazardous enclosed spaces</li> <li>Absence of a documented confined space management system for drainage assets, leading to unsafe entry and inspection practices</li> <li>Inadequate atmospheric testing and ventilation procedures for tanks, pits and long culvert runs</li> </ul>	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> <li>Insufficient planning for rescue and emergency response in the event of atmospheric contamination, flooding or collapse within the space</li> <li>Informal entry by workers to inspect or clean drainage and tank structures without permits or supervision</li> </ul>		[REDACTED]	
11. Traffic, Public Interface and Site Security	<ul style="list-style-type: none"> <li>Inadequate traffic management systems for works on or adjacent to roads, car parks or public access ways where culverts and drainage are installed</li> <li>Poorly controlled interaction between construction vehicles, delivery trucks and the public near open trenches, pits and tanks</li> <li>Insufficient site security or barriers around open excavations and incomplete drainage or tank structures after hours</li> <li>Lack of formal processes for updating traffic guidance schemes in response to staging changes or unexpected conditions</li> <li>Insufficient stakeholder communication with nearby residents, businesses or road users regarding culvert and drainage works</li> </ul>	High	[REDACTED]	Medium
12. Environmental and Water Management Interfaces	<ul style="list-style-type: none"> <li>Inadequate planning for stormwater, creek flows or tidal influences during culvert and tank installation, causing sudden inundation of excavations</li> <li>Erosion and sediment control failures impacting stability of culvert and drainage excavations</li> <li>Uncontrolled discharge of dewatering effluent leading to environmental non-compliance and reputational risk</li> </ul>	Medium	[REDACTED]	Low

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	<ul style="list-style-type: none"> <li>Poor coordination with environmental management plans, leading to conflicting requirements for access, spoil placement and stockpiling near drainage works</li> <li>Lack of integration of flood modelling and hydraulic design assumptions into construction staging and risk controls</li> </ul>		[REDACTED]	
13. Emergency Preparedness and Incident Management	<ul style="list-style-type: none"> <li>Lack of emergency response planning specific to trench collapse, culvert-tank instability, flooding or confined space incidents</li> <li>Inadequate communication systems for workers operating in remote or dispersed drainage work fronts</li> <li>No structured process for triage, rescue and coordination with emergency services in complex underground or water-related incidents</li> <li>Poor incident reporting and investigation systems, leading to repeat events and unaddressed root causes</li> <li>Limited availability or maintenance of emergency equipment such as rescue tripods, stretchers, lifelines and first aid kits</li> </ul>	High	[REDACTED]	Medium
14. Monitoring, Audit, Review and Continuous Improvement	<ul style="list-style-type: none"> <li>Failure to systematically monitor WHS performance on culvert and drainage projects, leading to drift from standards over time</li> <li>Inadequate auditing of compliance with excavation, confined space, plant and contractor management procedures</li> </ul>	Medium	[REDACTED]	Low

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	<ul style="list-style-type: none"> <li>No structured process for reviewing effectiveness of control measures following incidents, design changes or project completion</li> <li>Limited worker involvement in identifying systemic issues and suggesting improvements for drainage installation practices</li> <li>Poor data management and analysis of leading and lagging indicators related to culvert-tank and drainage risks</li> </ul>		<div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div>	

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/factsheets-and-resources/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.