

## Tunnelling Risk Assessment

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>	
<b>Risk Rating &amp; Required Action:</b>								<b>Notes on Hierarchy of Controls:</b>	
<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.								Remember to apply controls in the preferred order shown by the coloured pyramid:	
<b>3H</b> Review and approve additional controls before task starts. Senior supervisor sign-off needed.								1. <b>Eliminate</b>	
<b>2M</b> Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.								2. Substitute	
<b>1L</b> Proceed, following standard operating procedures. Monitor and keep records.								3. Isolate	
								4. Engineering	
								5. Administrative	
								6. PPE	
<b>Consequence Scale:</b>								Always document <b>why</b> a lower-order control is accepted if elimination or substitution is not reasonably practicable.	
Consequence	People (injury/illness)		Project / Assets		Compliance / Reputation				
Catastrophic	Fatality or permanent total disability		project shutdown		Significant regulator intervention; criminal prosecution				
Major	Serious injury/illness (hospital > 5 days)		critical delay		Improvement notice; major media coverage				
Moderate	Medical-treatment injury; lost-time > 1 day		moderate delay		Minor breach; adverse client comment				
Minor	First-aid only, no lost time		negligible delay		Isolated non-conformance				
Insignificant	No injury		no schedule impact		Deviation caught and corrected on site				
								<i>aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.</i>	

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. Preparation	Miscommunication, Inadequate training	3H	<ul style="list-style-type: none"> <li>- Conduct comprehensive inductions for all workers</li> <li>- Implement a clear communication protocol</li> <li>- Display safety signage and instructional material</li> <li>- Assign a dedicated safety officer on-site</li> <li>- Regularly review and update training materials</li> <li>- Use digital tools for ongoing training and assessments</li> <li>- Organise pre-start meetings for daily hazard briefings</li> <li>- Ensure clear role and responsibility assignments</li> <li>- Maintain a training log for all personnel</li> <li>- Encourage reporting of communication issues</li> </ul>	2M
2. Equipment Inspection	Faulty machinery, Unmaintained tools	4H	<ul style="list-style-type: none"> <li>- Schedule regular maintenance checks</li> <li>- Create a checklist for daily equipment inspections</li> <li>- Ensure operators have relevant certifications</li> <li>- Keep a detailed log of all maintenance activities</li> <li>- Remove any faulty equipment from service immediately</li> <li>- Equip all operators with PPE suitable for machinery use</li> <li>- Conduct regular audits of maintenance procedures</li> <li>- Provide training on equipment handling</li> <li>- Ensure adherence to manufacturer guidelines</li> <li>- Implement an equipment tagging system for defects</li> </ul>	2M
3. Site Survey	Unstable ground conditions, Inaccurate mapping	4A	<ul style="list-style-type: none"> <li>- Conduct geological surveys before work commencement</li> <li>- Implement ground risk assessment procedures</li> <li>- Employ qualified surveyors for accurate mapping</li> <li>- Utilise technology like drones for area surveying</li> <li>- Establish constant monitoring for ground shifts</li> <li>- Communicate survey results clearly to all teams</li> <li>- Train workers on recognising unstable conditions</li> <li>- Adjust work plans based on survey results</li> </ul>	2M

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			- Ensure reverse mapping aligns with real-time data - Use GPS tools for high accuracy	
4. Drilling Operations	Explosion risk, Falling debris	4A	[REDACTED]	3H
5. Excavation	Cave-ins, Equipment collisions	4A	[REDACTED]	3H
6. Tunnel Support Installation	Structural failure, Crane accidents	4A	[REDACTED]	3H

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7. Ventilation Setup	Gas accumulation, Poor air quality	4A		2M
8. Electrical Installation	Electric shock, Fire	4A		2M
9. Water Management	Flooding, Water contamination	4A		2M

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			<div></div> <div></div> <div></div> <div></div>	
10. Worker Evacuation	Delayed response, Injury during evacuation	4A	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>	2M
11. Fire Safety	Potential for fire, Smoke inhalation	4A	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div>	2M
12. Hazardous Material Handling	Human exposure, Environmental spill	4A	<div></div> <div></div> <div></div> <div></div> <div></div>	2M

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13. Confined Space Work	Limited oxygen, Entrapment	4A		2M
14. Noise Management	Hearing damage, Communication loss	4A		2M
15. Lighting Setup	Insufficient lighting, Electrical hazard	3H		2M

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16. Traffic Management	Vehicular collisions, Pedestrian accidents	4A		3H
17. Worker Fatigue Management	Reduced concentration, Slow reaction time	4A		2M
18. Emergency Response	Delayed medical attention, Unclear procedures	4A		2M



Disposal, Contamination 3H

## 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 IF 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 2017

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) Regulations 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>

### 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

### 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>

### 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.