

Shotcrete Grouting and Concrete Repair

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			Elimination Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	Substitution 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.	Engineering Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	Administrative Change	
								PPE	

Risk Rating & Required Action:	
4A	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.
3H	Review and approve additional controls before task starts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.
1L	Proceed, following standard operating procedures. Monitor and keep records.

Consequence Scale:			
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

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, Roles and Responsibilities	<ul style="list-style-type: none"> Unclear allocation of WHS duties under WHS Act 2011 for PCBUs, officers and workers involved in shotcrete and grouting works Lack of documented WHS objectives and due diligence processes for concrete repair activities Inadequate consultation, cooperation and coordination between principal contractor, subcontractors and suppliers Failure to integrate WHS obligations into commercial contracts and scopes of work Inconsistent enforcement of site rules and safe systems of work for shotcreting operations 	4A	<ul style="list-style-type: none"> Establish a WHS governance framework that explicitly references WHS Act 2011 and WHS Regulation duties for shotcrete, grouting and concrete repair activities Define and document roles, responsibilities and authorities for officers, project managers, supervisors, health and safety representatives and workers involved in sprayed concrete and repair works Embed WHS performance obligations, incident reporting requirements and competency expectations into contracts with shotcrete and grouting subcontractors Implement a formal consultation procedure including toolbox meetings, pre-start briefings and coordination meetings covering all parties on joint worksites Develop and enforce a WHS policy that mandates use of documented risk assessments and SWMS for all high-risk construction work including shotcreting and working in or near excavations and structures Conduct periodic senior due diligence reviews and board-level WHS performance reporting specific to concrete repair projects 	2M
2. WHS Planning, Risk Management and Design Integration	<ul style="list-style-type: none"> Shotcrete and grouting methods selected without early WHS input at design stage Failure to identify high-risk construction work associated with shotcreting operations (e.g. work in or near confined spaces, structural collapse) Inadequate risk assessments of application of sprayed concrete, expansive grouting and injection grouting under varying environmental and structural conditions Poor change management when repair methods, products or construction sequences are altered Lack of consideration of access, egress and emergency rescue in design of concrete repair methodology 	4A	<ul style="list-style-type: none"> Integrate WHS and constructability reviews into early design stages for shotcrete, crack repairs and grouting systems, involving engineers, supervisors and WHS professionals Use a formal risk management procedure aligned with AS/NZS ISO 31000 that specifically addresses sprayed concrete, chipping operations, expansive grouts and injection grouts Classify and document high-risk construction work items and ensure corresponding SWMS are prepared, reviewed and approved before work commences Implement a documented management of change process for any alteration to repair scope, mix designs, equipment, access arrangements or staging of shotcreting works Require engineering assessments and design certification for structural repairs, temporary works, formwork and support systems to control collapse risks during application and curing Include requirements for emergency access routes, working platforms, fall prevention systems and exclusion zones in project planning documentation 	2M
3. Contractor, Supplier and Subcontractor Management	<ul style="list-style-type: none"> Engagement of shotcrete and grouting contractors without verifying competence or licence requirements Inadequate review of subcontractor WHS management systems, SWMS and insurances 	4A	<ul style="list-style-type: none"> Implement a pre-qualification process that verifies contractor experience, licences, shotcrete operator certification, references and WHS performance history Require submission and review of each contractor's WHS management plan, risk assessments and SWMS covering shotcreting, chipping, injection grouting and crack repairs before mobilisation Include specific WHS requirements for material handling, storage, safety data sheets (SDS) and product technical data in procurement and supply agreements 	2M

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	<ul style="list-style-type: none"> Poor control of specialist suppliers delivering shotcrete, admixtures and grouting materials to site Lack of clarity on who controls work areas and exclusion zones during multi-contractor operations Subcontractor cost pressures leading to shortcuts in safety systems and maintenance 		<ul style="list-style-type: none"> Define in writing the principal contractor and site controller responsibilities and ensure clear demarcation of work zones and exclusion areas among all contractors Use a contractor performance monitoring system including regular WHS inspections, audits, and KPIs related to safety leadership and compliance for concrete repair works Enforce a non-conformance and corrective action process for contractors who fail to follow agreed safety systems, with escalation up to suspension of work if required 	
4. Competency, Training and Licensing	<ul style="list-style-type: none"> Shotcrete nozzle operators and grouting technicians performing work without formal training or verified competency Supervisors lacking specific knowledge of sprayed concrete behaviour, rebound management and structural repair techniques Inadequate training in safe use of pumps, compressors, mixers and pressure systems for injection and expansive grouting Poor understanding of chemical hazards, SDS requirements and correct PPE for cementitious and resin-based systems Lack of refresher training leading to skill fade and unsafe practices becoming normalised 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M
5. Plant, Equipment and Maintenance Systems	<ul style="list-style-type: none"> Failure of shotcrete pumps, hoses or nozzles leading to hose whip, bursts or uncontrolled discharge Inadequate inspection and maintenance of air compressors, mixers, agitator trucks and vibrating tools Use of incompatible or damaged hoses, couplings and clamps for high-pressure grout injection systems Lack of guarding and emergency stops on mechanical chipping and demolition equipment used for surface preparation 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> Unplanned plant movements of loaders, telehandlers, MEWPs and delivery trucks in congested work areas 		[REDACTED]	
6. Materials, Chemical Safety and Dust Management	<ul style="list-style-type: none"> Uncontrolled exposure to respirable crystalline silica from dry shotcrete, concrete chipping and surface preparation Skin and eye irritation or burns from cementitious products, additives and expansive grouts Use of resin, epoxy or chemical grout systems without appropriate ventilation and health controls Incorrect storage, labelling or segregation of hazardous substances leading to spills or unintended reactions Lack of control over dust, overspray and rebound affecting adjacent workers, public areas or sensitive equipment 	4A	[REDACTED]	2M
7. Structural Stability, Temporary Works and Access Systems	<ul style="list-style-type: none"> Application of shotcrete or expansive grout on weakened or partially demolished structures without engineering verification of stability Failure of temporary works, formwork, mesh or support systems during sprayed concrete application Inadequate design and inspection of scaffolding, working platforms and access systems around repair areas Overloading of slabs, decks or existing structures with heavy plant, materials and wet concrete Inadequate anchorage of fall prevention and restraint systems for workers conducting repairs at height or over edges 	4A	[REDACTED]	2M

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8. Work Environment, Ventilation and Confined Spaces	<ul style="list-style-type: none"> Shotcreting and injection grouting carried out in tunnels, shafts, basements or tanks with inadequate ventilation Accumulation of dust, fumes and exhaust gases from plant and curing processes in poorly ventilated areas Undertaking grouting and repair work in confined spaces without proper entry permits and emergency plans Limited visibility, poor lighting and restricted access routes in complex concrete repair environments Heat stress or cold stress affecting workers applying shotcrete in extreme temperatures or enclosed areas 	4A	[REDACTED]	2M
9. Pressure Systems, Injection Processes and Energy Isolation	<ul style="list-style-type: none"> Sudden release of high-pressure grout or air causing hose whip, injection injury or structural damage Blockages in lines leading to over-pressurisation and consequent hose or fitting failure Uncontrolled injection of excess grouts causing cracking or damage to structures and services Inadequate lock-out tag-out procedures during maintenance, cleaning or clearing of blocked pumps and lines Workers exposed to stored energy in hoses, accumulators, hydraulic systems or pressurised tanks 	1A	[REDACTED]	2M
10. Exposure to Noise, Vibration and Ergonomic Strain	<ul style="list-style-type: none"> Chronic noise exposure from compressors, pumps, chipping hammers and spraying operations Hand–arm vibration from prolonged use of chipping tools, breakers and vibrating equipment Musculoskeletal strain from manual handling of hoses, bags of product, 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> mesh, and awkward postures during overhead or vertical repairs Fatigue arising from long shifts, repetitive tasks and physically demanding work in challenging environments Insufficient rotation of tasks leading to cumulative overuse injuries for specialist operators 		[REDACTED]	
11. Site Coordination, Traffic Control and Public Interface	<ul style="list-style-type: none"> Interaction between shotcrete rigs, agitator trucks, mobile plant and pedestrians in confined site access points Pump lines, hoses and rebound encroaching into live traffic lanes or public walkways Inadequate separation between concrete repair work zones and adjacent trades creating struck-by or overspray risks Deliveries of materials, cylinders and chemicals occurring without traffic management in place Shotcreting and chipping activities generating noise, dust or debris impacting neighbours and the public 	3H	[REDACTED]	2M
12. Emergency Preparedness, Incident Response and First Aid	<ul style="list-style-type: none"> Lack of specific emergency procedures for shotcrete and grouting incidents such as hose bursts, structural instability or chemical exposure Insufficient first aid capability for eye injuries, skin contact with cementitious or chemical products and injection injuries Ineffective communication systems in tunnels, basements or remote work fronts during an emergency Delayed rescue of workers operating in elevated, confined or hard-to-access locations 	3H	[REDACTED]	1L

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	<ul style="list-style-type: none"> Inadequate incident reporting, investigation and corrective actions following near misses or injuries 		[REDACTED]	
13. Documentation, Records and Compliance Assurance	<ul style="list-style-type: none"> Incomplete or outdated SWMS, risk assessments and procedures for concrete repair systems Failure to maintain inspection, maintenance and training records required under WHS legislation and Australian Standards Inadequate verification of compliance with design specifications, curing regimes and structural repair requirements Loss of critical information when personnel change or multiple contractors share documentation informally Inability to demonstrate due diligence in the event of regulatory scrutiny or serious incident 	3H	[REDACTED]	1L
14. Health Monitoring, Fitness for Work and Fatigue Management	<ul style="list-style-type: none"> Workers exposed to respirable crystalline silica, cement additives or resins without appropriate health monitoring where required Employees undertaking demolition, shotcrete and chipping work while medically unfit or impaired by drugs, alcohol or fatigue Extended shifts, night work and tight program pressures contributing to reduced alertness and poor decision-making Inconsistent application of fitness for work and drug and alcohol policies across contractors Under-reporting of early health symptoms due to cultural or job security concerns 	3H	[REDACTED]	2M
15. Continuous Improvement and Lessons Learned	<ul style="list-style-type: none"> Repeat incidents or near misses due to lack of organisational learning from previous shotcrete and grouting projects 	3H	[REDACTED]	1L

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	<ul style="list-style-type: none"> • Failure to keep up with changes in legislation, Australian Standards and industry best practice for sprayed concrete and structural repairs • No mechanism to capture workers' feedback on practicality and effectiveness of current controls • Reliance on informal knowledge transfer between projects leading to inconsistent WHS performance • Inadequate review of design, methodology and WHS controls at the completion of major repair works 		<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	

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.