

**Post-Tensioning (Monostrand)**

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. Procurement, Design and Engineering Controls for Post-Tensioning Systems	<ul style="list-style-type: none"> <li>• Selection of post-tensioning systems or components that are not compliant with Australian Standards (e.g. AS 3600, AS/NZS 4672, AS/NZS 1576 where relevant)</li> <li>• Inadequate engineering design for stressing loads, anchorage zones and construction sequence, leading to over-stressing or structural failure</li> <li>• Use of untested or inferior monostrand components (tendons, anchors, wedges, grout) without traceability or certification</li> <li>• Insufficient design coordination between structural engineer, post-tensioning specialist and principal contractor, resulting in clashes, tendon congestion and constructability issues</li> <li>• Inadequate specification of temporary works (formwork, backpropping, load transfer sequences) to safely resist stressing forces</li> <li>• Incomplete or unclear design documentation, including stressing records, elongation tolerances and load transfer criteria</li> <li>• Failure to incorporate safe access, exclusion zones and lifting points into the design for stressing equipment and coils</li> <li>• Lack of clear design assumptions for construction staging, leading to unsafe changes during site works</li> </ul>	High	<ul style="list-style-type: none"> <li>• Require all post-tensioning (PT) systems and components to be designed, supplied and installed in accordance with current Australian Standards and manufacturer technical data, verified through documented technical submissions</li> <li>• Engage suitably qualified and experienced structural and/or design engineers (RPEQ/Chartered where applicable) with defined roles under the WHS Regulations for design duties</li> <li>• Implement a formal design review and verification process (including peer review for complex or high-risk structures) documented with sign-off prior to procurement and construction</li> <li>• Mandate product compliance evidence (test certificates, material certificates, batch records, conformity statements) for tendons, anchors, wedges and grout prior to use on site</li> <li>• Require detailed, coordinated PT shop drawings showing tendon layout, stressing sequence, jacking forces, elongations, anchorage zones and construction stages, approved by the engineer of record</li> <li>• Include explicit design of temporary works, backpropping layouts, pour breaks and load transfer stages, with clear limitations on early loading on slabs and beams</li> <li>• Document design assumptions for construction methodology and incorporate them into the project WHS management plan and construction methodology statements</li> <li>• Ensure the PT design includes provisions for safe access, equipment set-up, exclusion zones and lifting arrangements for PT equipment, coils and jacks</li> <li>• Establish a management-of-change (MOC) procedure so any design or system change (e.g. tendon routing, stressing sequence, construction staging) is risk assessed, engineered and formally approved before implementation</li> <li>• Specify in procurement contracts that PT suppliers/installers must provide full as-built documentation, stressing records and QA traceability as a condition of payment</li> </ul>	Medium
2. Contractor Selection, Prequalification and Subcontractor Management	<ul style="list-style-type: none"> <li>• Engagement of PT contractors without demonstrated competency, licensing or experience in monostrand post-tensioning</li> <li>• Inadequate vetting of subcontractor WHS systems, leading to gaps in safe work procedures and supervision</li> <li>• Subcontractors working under informal arrangements without clear allocation of WHS responsibilities under the WHS Act</li> </ul>	High	<ul style="list-style-type: none"> <li>• Implement a formal prequalification process for PT contractors that assesses technical competence, previous PT project experience, WHS performance history, and certification to recognised management systems where applicable (e.g. ISO 45001)</li> <li>• Require PT contractors to submit a project-specific WHS management plan, safe work procedures and engineering documentation for review and approval prior to site mobilisation</li> <li>• Include explicit WHS obligations, consultation requirements and reporting expectations in PT subcontract agreements, aligned with WHS Act 2011 duties for PCBUs and officers</li> </ul>	Medium

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	<p>2011 (PCBU duties and consultation duties)</p> <ul style="list-style-type: none"> <li>Poor interface management between PT contractor, formwork, reinforcement, crane crews and main contractor causing conflicting activities in the same work area</li> <li>Inadequate resourcing by PT subcontractor, leading to fatigue, rushed work and shortcuts</li> <li>Lack of clear escalation pathways for WHS issues raised by PT workers or supervisors</li> </ul>		<ul style="list-style-type: none"> <li>Verify qualifications and experience of key PT personnel (project manager, supervisor, leading hand, stressing technician) before granting site access</li> <li>Establish an interface management plan that defines responsibilities, communication protocols and coordination processes between PT contractor and other trades</li> <li>Set minimum supervision ratios and specify that a competent PT supervisor must be present whenever stressing works or critical PT activities are undertaken</li> <li>Include WHS performance measures, leading indicators (inspections, close-call reporting) and lagging indicators (injuries, non-conformances) in subcontractor performance reviews</li> <li>Require subcontractors to participate in coordination meetings, pre-starts and WHS committees and to maintain documentation of compliance and actions</li> <li>Define clear escalation and issue-resolution pathways for PT-related WHS concerns, including authority to stop work where serious risk is identified</li> <li>Undertake periodic WHS and technical audits of PT subcontractors against agreed standards, with corrective action plans and follow-up verification</li> </ul>	
3. Governance, WHS Leadership and Consultation	<ul style="list-style-type: none"> <li>Lack of visible leadership commitment to WHS in relation to high-risk PT operations, leading to tolerance of unsafe practices</li> <li>Failure to clearly define WHS responsibilities, accountabilities and authorities across client, principal contractor and PT subcontractor</li> <li>Ineffective consultation with workers, health and safety representatives (HSRs) and PT supervisors resulting in unreported hazards and unresolved issues</li> <li>Inadequate officer due diligence in verifying that systems for PT risk control are implemented and effective</li> <li>Conflicting production and safety priorities, creating pressure to bypass critical controls such as exclusion zones or engineering verification</li> <li>Poor learning culture leading to repeated PT incidents or near misses without systemic corrective action</li> </ul>	High	<ul style="list-style-type: none"> <li>Establish a project WHS governance structure that explicitly recognises PT as a high-risk construction activity and defines roles and responsibilities in accordance with the WHS Act 2011</li> <li>Ensure officers (directors, senior managers) exercise due diligence over PT activities by regularly reviewing risk assessments, incident trends, audit outcomes and resourcing requirements</li> <li>Include PT risk and performance as standing agenda items at project leadership, coordination and WHS committee meetings, with documented actions and accountabilities</li> <li>Implement structured consultation mechanisms (toolbox talks, HSR forums, safety walks) that specifically address PT risks and seek feedback from PT workers and supervisors</li> <li>Set clear 'line in the sand' rules for PT works (e.g. no stressing without signed-off design and ITPs, mandatory exclusion zones, lift plans) and enforce them through supervisors and managers</li> <li>Promote a just culture that encourages reporting of near misses and hazards associated with PT operations without fear of reprisal, supported by a confidential reporting channel</li> <li>Ensure regular WHS leadership visits to active PT areas by senior management to demonstrate commitment, verify controls in the field and engage with workers</li> <li>Review PT-related incidents, near misses and non-conformances using structured investigation methods (e.g. ICAM, TapRoot) to identify systemic causes and embed learnings project-wide</li> <li>Integrate PT WHS expectations into performance reviews for managers and supervisors to reinforce accountability</li> </ul>	Medium
4. Training, Competency and Licensing for Post-Tensioning Personnel	<ul style="list-style-type: none"> <li>Inadequate training of PT supervisors, stressing operators and labourers in PT principles, hazards and control measures</li> </ul>	High		Medium

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	<ul style="list-style-type: none"> <li>Workers performing specialised tasks (stressing, grouting, equipment set-up) without verification of competency or required high-risk work licences</li> <li>Limited understanding of load paths, tendon behaviour and anchorage zone hazards leading to unsafe decisions during stressing</li> <li>Inconsistent induction processes that fail to cover PT-specific risks such as stored energy, strand recoil and concrete blowouts</li> <li>Lack of refresher training or competency reassessment when systems, equipment or procedures change</li> <li>Inability of workers to read and interpret PT drawings, stressing records and manufacturer instructions</li> </ul>		[REDACTED]	
5. Planning, Coordination and Scheduling of Post-Tensioning Works	<ul style="list-style-type: none"> <li>Poor sequencing of PT works with formwork, reinforcement and concrete placement and other trades, causing time pressure and increased risk of errors</li> <li>Stressing undertaken before concrete has achieved required strength due to program pressure or inadequate curing</li> <li>Overlap of PT operations with crane lifts, working at height, formwork stripping or concrete finishing, leading to congested work areas and conflicting priorities</li> <li>Last-minute design changes or site instructions without adequate engineering review and WHS risk assessment</li> <li>Insufficient planning for night works or weekend operations where supervision and support services are reduced</li> <li>Inadequate contingency planning for delays, equipment failures or bad</li> </ul>	High	[REDACTED]	Medium

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	weather affecting PT critical path activities		[REDACTED]	
6. Equipment, Plant and Tooling Management for Post-Tensioning	<ul style="list-style-type: none"> <li>• Use of poorly maintained or incorrectly calibrated stressing jacks, pumps, gauges and load cells leading to over- or under-stressing</li> <li>• Failure of hoses, fittings or hydraulic systems resulting in high-pressure fluid injection or uncontrolled movement of equipment</li> <li>• Inadequate guarding, securing or attachment of jacks and reaction frames, leading to sudden release under load</li> <li>• Use of incompatible components (e.g. wedges, anchorages, couplers) not designed for the specific monostrand system</li> <li>• Insufficient inspection and tagging regime for lifting equipment, strand reels, power tools and ancillary plant</li> <li>• Uncontrolled modification of PT equipment by untrained personnel</li> <li>• Inadequate storage and handling systems for PT equipment increasing manual handling and trip hazards</li> </ul>	High	[REDACTED]	Medium
7. Material Handling, Storage and Logistics for Monostrand Systems	<ul style="list-style-type: none"> <li>• Unplanned movement or collapse of strand coils, anchorages or heavy PT components during transport, lifting or storage</li> <li>• Inadequate storage arrangements leading to corrosion, contamination or damage to strands and wedges, affecting performance at stressing</li> <li>• Manual handling of heavy or awkward PT components increasing musculoskeletal injury risk</li> </ul>	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> <li>Poor traffic and logistics planning leading to interaction between delivery vehicles, cranes and workers in PT work zones</li> <li>Unclear labelling and segregation of PT materials, resulting in mixing of incompatible components or incorrect specification use</li> <li>Insufficient control of lifting points and rigging arrangements for PT equipment and coils</li> </ul>		[REDACTED]	
8. Systemic Control of Stored Energy, Exclusion Zones and Work Area Management	<ul style="list-style-type: none"> <li>Uncontrolled release of stored energy in tendons during stressing, cutting or failure, resulting in strand whip or projectile hazards</li> <li>Unauthorised entry of workers into exclusion zones in line with tendons or around anchorage zones during stressing operation</li> <li>Inadequate definition and communication of no-go areas, barricading and spotting elements</li> <li>Work being undertaken above or below PT stressing areas, exposing workers to falling objects or structural movement</li> <li>Failure to manage the interaction between PT operations and temporary works (formwork, falsework, backpropping), increasing collapse or movement risk</li> </ul>	High	[REDACTED]	Medium

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9. Documentation, Procedures, Inspection and Quality Assurance	<ul style="list-style-type: none"> <li>Absence of formalised PT-specific procedures, ITPs and checklists, leading to inconsistent practices between crews and shifts</li> <li>Incomplete or inaccurate records of stressing forces, elongations, concrete strengths and anchor settings, impeding verification of structural performance</li> <li>Failure to identify and rectify non-conforming PT work (e.g. mislocated tendons, damaged ducts, incorrect anchorage installation)</li> <li>Poor control of latest approved drawings and specifications, leading to construction from superseded documentation</li> <li>Lack of systematic inspections before, during and after key PT stages (pre-pour, post-pour, stressing, grouting)</li> <li>Inadequate retention of PT QA records for future reference, compliance and asset management</li> </ul>	High	<p>[REDACTED]</p>	Low
10. Emergency Preparedness, Incident Response and Health Monitoring	<ul style="list-style-type: none"> <li>Lack of prepared emergency response for PT-specific failures (tendon snap, anchorage blowout, concrete spalling) resulting in delayed or ineffective response</li> <li>Inadequate communication systems for summoning assistance from elevated decks or remote PT work areas</li> <li>Unclear roles and responsibilities during PT incidents, leading to duplication, confusion or unsafe interventions</li> <li>Failure to manage psychological impacts on workers following serious PT incidents or near misses</li> <li>Insufficient monitoring of health impacts related to PT works, including</li> </ul>	High	<p>[REDACTED]</p>	Medium

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	noise, vibration and potential exposure to grout chemicals or silica dust from associated activities		[REDACTED]	
11. Regulatory Compliance, Auditing and Continuous Improvement	<ul style="list-style-type: none"> <li>• Non-compliance with WHS Act 2011, WHS Regulations and relevant Australian Standards for construction and PT activities</li> <li>• Failure to identify PT as high-risk construction work, leading to inadequate safe work planning and documentation</li> <li>• Inconsistent application of risk management processes across different projects or PT crews</li> <li>• Limited use of data and lessons learned from incidents, investigations and audits to drive systematic improvements</li> <li>• Inadequate preparation for regulatory inspections or investigations related to PT works</li> </ul>	High	[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.