

Steel Fixing Reinforcement and Post-Tensioning

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 Management, Governance and Legal Compliance	<ul style="list-style-type: none"> WHS responsibilities for steel fixing and post-tensioning not clearly defined under WHS Act 2011 and WHS Regulations Lack of documented WHS management plan specific to reinforcement and post-tensioning activities Inadequate consultation with workers, subcontractors and PCBUs regarding high-risk construction work (HRCW) obligations Failure to identify and apply relevant Australian Standards (e.g. AS 3600, AS/NZS 1576, AS/NZS 3012, PTIA guidelines) Poor integration of principal contractor's WHS systems with specialist post-tensioning subcontractors Insufficient review of Safe Work Method Statements (SWMS) for high-risk work such as tensioning steel strands and use of post-tensioning tools Inadequate processes for monitoring compliance with permits, licences and competency requirements Lack of documented escalation pathways for WHS issues related to anchoring rod installations and tendon stressing 	4A	<ul style="list-style-type: none"> Develop and implement a project-specific WHS management plan that explicitly addresses steel fixing reinforcement and post-tensioning activities, aligned with the WHS Act 2011 and WHS Regulations Define and document WHS roles, responsibilities and accountabilities for the principal contractor, structural engineer, post-tensioning specialists and steel fixing contractors Establish a formal WHS consultation and coordination framework including regular coordination meetings, toolbox talks and pre-starts for reinforcement and post-tensioning works Maintain a legal standards register capturing applicable legislation, codes of practice and Australian Standards relevant to steel reinforcement, post-tensioning and temporary works Implement a structural SWMS review and approval process to ensure all high-risk construction work activities (including tendon stressing, use of hydraulic jacks and working around exposed re-bar) are covered and regularly updated Undertake periodic WHS compliance audits focusing on management systems for anchoring rod installation, tensioning operations and casting activities Establish a formal WHS issue escalation and incident notification procedure, including near-miss reporting related to reinforcement and post-tensioning hazards Ensure contractual arrangements with subcontractors include explicit WHS performance requirements, reporting obligations and right of audit 	3H
2. Design, Engineering and Constructability Management	<ul style="list-style-type: none"> Reinforcement and post-tensioning design not adequately considering buildability, sequencing and access for safe steel fixing and tendon stressing Inadequate specification of anchoring rod locations, clearances and protection, leading to clash with other services and unsafe temporary conditions Insufficient allowance in design for edge protection, fall prevention and safe access during mesh installation and tendon installation 	4A	<ul style="list-style-type: none"> Require design risk assessments from structural engineers and post-tensioning designers, explicitly addressing constructability, safe access and staging of steel fixing and stressing work Implement a formal design coordination process (BIM or coordinated drawings) to resolve clashes between reinforcement, post-tensioned cables, anchoring rods and services before site installation Ensure design documentation includes details for temporary works, stressing sequences, live-end and dead-end anchorages, and protection of tendons during casting Specify minimum working space, access points and edge protection requirements within the design for areas where trench mesh, wire mesh and re-bar will be installed Include in the design and specifications requirements for capping or guarding exposed re-bars and projections, particularly at slab edges, cores and stairwells 	2M

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	<ul style="list-style-type: none"> • Complex tendon profiles and congested reinforcement increasing risk of manual handling injuries and installation errors • Inadequate design documentation for post-tensioning stressing stages and load paths, increasing risk of over-stressing or tendon failure • Omission of protective detailing for exposed re-bar and unprotected projections, creating impalement hazards • Lack of design coordination for trench mesh in footings, leading to unstable excavation edges and access problems • Design changes not effectively managed, resulting in unverified deviations from certified PT or reinforcement design 		<ul style="list-style-type: none"> • Develop a documented engineering review and approval process for any design changes to reinforcement schedules, tendon layouts or anchoring systems • Verify that tensioning loads, jack capacities and stressing procedures are compatible with the structural design and staging of formwork and propping • Incorporate durability, corrosion protection, and inspection access considerations for PT ducting, anchorages and reinforcement in harsh environments 	
3. Supplier, Fabrication and Material Quality Management	<ul style="list-style-type: none"> • Reinforcing steel, trench mesh, wire mesh and post-tensioning components not meeting specified grade, strength or Australian Standards • Inadequate traceability and certification for tendons, anchorages, wedges, ducts and anchoring rods • Substandard or damaged PT hardware (e.g. jacks, hoses, couplers) leading to failure during stressing • Poor quality control in prefabricated reinforcement cages and mesh inclusions, leading to instability during placement • Contaminated or corroded reinforcement and tendons due to poor storage, increasing risk of structural failure • Incorrect or incompatible anchoring rods and fixings supplied for cast-in installations 	3H	<ul style="list-style-type: none"> • Engage only pre-qualified suppliers who can demonstrate compliance with relevant Australian Standards for reinforcing and post-tensioning materials • Implement procurement specifications requiring mill certificates, product data sheets and conformity statements for reinforcement bar, mesh, tendons and anchors • Establish inspection and test plans (ITPs) covering receiving inspection, storage, handling and pre-installation checks of all reinforcement and PT components • Maintain a traceability system linking delivered tendons, anchorages, wedges and rods to batch certificates and design requirements • Introduce a non-conformance reporting (NCR) process for damaged or non-compliant reinforcement, mesh and PT hardware, including hold and quarantine procedures • Require periodic calibration and inspection certificates for all stressing jacks, gauges, pumps and pre-tensioning tools from a competent service provider • Specify storage and handling procedures (off-ground, protected from moisture and contamination) for reinforcement, trench mesh, wire mesh and PT tendons • Conduct supplier performance reviews and audits focusing on quality, documentation and WHS compliance for steel fixing materials and PT equipment 	2M

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	<ul style="list-style-type: none"> Inadequate lead time for installation of trench mesh, wire mesh inclusions and anchoring rods prior to inspection and pour Unplanned work at height or over live edges while installing mesh and tendons due to compressed schedules Concurrent trades interfering with PT stressing zones, increasing risk of struck-by hazards from stored energy release Out-of-sequence placement of reinforcement and tendons resulting in rework and unsafe adjustments under time pressure Tensioning steel strands at night or in poor visibility conditions due to programme slippage Inadequate planning for rebar capping and protection measures as construction stages progress 		<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	
6. Site Layout, Access and Egress for Steel Fixing and PT Work	<ul style="list-style-type: none"> Restricted access and poor housekeeping around reinforcement and PT zones causing trips, falls and musculoskeletal injury Unsafe access routes over rebar mats, trench mesh and wire mesh inclusions prior to pour Inadequate working platforms and edge protection around slab perimeters and cores with exposed rebar and projections Insufficient segregation of pedestrian routes from crane, delivery and loading areas for reinforcing and PT equipment Lack of designated laydown areas for long tendons, steel strands and mesh panels, leading to unstable stacking Inadequate lighting in reinforcement pits, footings and PT anchorage zones affecting visibility of hazards 	3H	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> Obstructed emergency egress paths due to stored re-bar bundles, PT equipment and formwork materials Improvised access (e.g. walking on PT ducts or unstable mesh) due to poor layout planning 			
7. Plant, Tools and Equipment Management for Tensioning and Fixing	<ul style="list-style-type: none"> Failure or malfunction of hydraulic jacks, pumps, hoses and gauges during stressing of tendons and steel strands Use of unsuitable or poorly maintained pre-tensioning tools leading to sudden release of stored energy Inadequate guarding or securing of anchors and wedges during tensioning operations Uncontrolled movement of heavy mesh panels, re-bar bundles and trench mesh during manual handling or crane lifts Improper selection of lifting gear and attachments for long tendons and heavy reinforcement cages Limited inspection and maintenance regime for portable power tools used to cut or bend re-bar Use of non-rated or improper equipment to support ducts, cables and mesh inclusions during installation Lack of pressure relief protocol and isolation of energy sources before maintenance on PT equipment 	4A	<p>[REDACTED]</p>	2M
8. Structural Stability, Temporary Works and Stored Energy Control	<ul style="list-style-type: none"> Unstable reinforcement cages, trench mesh and wire mesh inclusions during installation and prior to concrete placement Collapse or movement of formwork and supports under load from reinforcement and stressed tendons Uncontrolled release of stored energy from PT tendons, steel strands or anchoring rods during stressing or cutting 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> Inadequate bracing of vertical re-bar and starter bars creating topple risks Failure to protect and support PT ducts and tendons during casting and vibration, leading to displacement and stressing anomalies Cutting or damaging live or partially stressed tendons due to poor identification and control Lack of engineering verification of temporary works supporting PT anchorages and stressing platforms Inadequate control of stressing sequences causing uneven loading and structural instability 		[REDACTED]	
9. Impalement, Penetration and Exposed Re-Bar Risk Management	<ul style="list-style-type: none"> Unprotected projections and exposed re-bars around slab edges, stair cores and penetrations creating impalement risks Vertical starter bars without caps in access routes and work areas Inadequate guarding of anchoring rods and protruding anchors prior to concrete pours or in partially completed stages Falls onto projection of rebar from incomplete platform or unstable surfaces Workers moving over congested re-bar and mesh while carrying loads, increasing risk of slips onto sharp projections Insufficient planning for progressive removal and reinstatement of rebar caps as works proceed Poor visibility of protruding steel in low light or cluttered work areas Non-compliant or damaged rebar caps used as protection 	4A	[REDACTED]	2M
10. Manual Handling, Ergonomics and	<ul style="list-style-type: none"> Repetitive bending, tying and cutting of re-bar and mesh leading to musculoskeletal disorders 	3H	[REDACTED]	2M

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Musculoskeletal Risk Controls	<ul style="list-style-type: none"> Manual lifting and handling of heavy mesh panels, trench mesh and long reinforcing bars Awkward postures when installing wire mesh inclusions in footings and confined areas Handling and positioning of post-tensioning ducts, tendons and anchoring rods without mechanical aids Insufficient rotation of workers across high-strain tasks such as tying dense reinforcement mats Inadequate planning for mechanical lifting devices in congested areas Fatigue from prolonged static postures while working over rebar mats or in stressed tendon zones Lack of ergonomically designed tools for tying, cutting and bending steel 		[REDACTED]	
11. Environmental Conditions, Fatigue and Occupational Health	<ul style="list-style-type: none"> Heat stress and dehydration during outdoor steel fixing and tendon stressing operations Fatigue due to extended shifts or night work during critical hours and stressing windows Slips, trips and loss of footing on wet or icy rebar, mesh and PT ducts in adverse weather Inadequate planning for work in confined or partially enclosed spaces (e.g. deep footings, basements) with reinforcement congestion Noise exposure from cutting, bending and tensioning equipment above acceptable limits Exposure to vibration from power tools used for cutting and tying steel Insufficient consideration of dust and fume hazards from cutting or welding of reinforcement or anchor plates 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Lack of verification that design changes have been implemented correctly on site Inconsistent use of checklists for pre-pour and pre-stressing inspections Poor retention of records required for statutory and contractual compliance Inability to trace and rectify defects or non-conformances in reinforcement and PT works 		<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	
14. Emergency Preparedness, Incident Response and Learning	<ul style="list-style-type: none"> Lack of specific emergency procedures for tendon failure, jack rupture or sudden release of stored energy Delayed response to serious injuries from impalement, crushing or falls around exposed re-bar and PT equipment Insufficient first aid resources and trained first aiders in reinforcement and PT work areas Poor communication methods for summoning assistance in remote or basement locations where PT stressing occurs Failure to investigate near misses involving PT operations, anchoring re-bars or mesh handling, leading to repeated incidents No scenario-based drills for high-risk events linked to reinforcement and post-tensioning Inadequate coordination with emergency services regarding site access constraints around reinforcement zones Lessons learned from previous PT and steel fixing incidents not captured or shared across projects 	3H	<p>[REDACTED]</p>	2M

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.