Reinforcement Pre-Fabrication and Bar Bending Machinery

Business Name:	ABN:	
Business Address:		
Contact Person:	Phone:	Email:

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU OF THE 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:

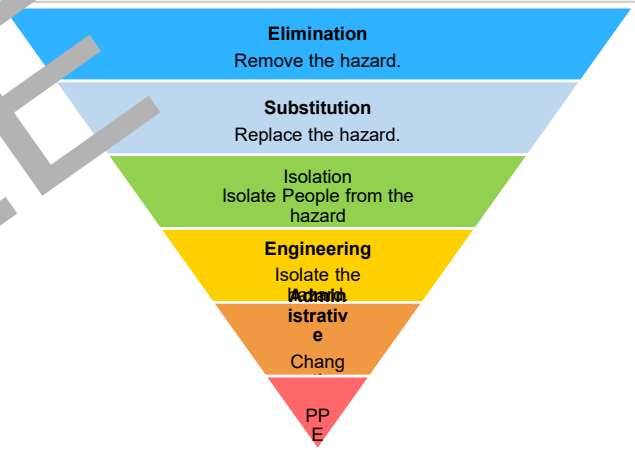
CLIENT OR PRINCIPAL CONTRACTOR DETAILS

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
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE		
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Rev before work
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACU	2M MO RATE	Ensure control measures in place.
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 H	1L LOW	Monitor and keep records.

HIERARCHY OF CONTROLS



Risk Rating & Required Action:

4A	Stop work. The risk is intolerable. E inate the hazar redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or hi er-level authorisati is required.
3H	Review and approve additional c rols b ask arts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in ace and effe ive. 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. Governance, WHS Leadership and Legal Compliance	• Lack of clear WHS responsibilities for reinforcement pre-fabrication and bar bending machinery • Inadequate understanding of WHS Act 2011 and WHS Regulations duties regarding plant and high-risk construction work • No formal WHS policy specific to prefabrication, bar bending, cagemaking and bundling operations • Failure to consult workers and health and safety representatives on plant and process changes • Insufficient resourcing for WHS (time, budget, competent people) leading to unmanaged systemic risks	4A	• Establish and document a WHS management syste aligned to WHS Act 2011, WHS Regulations, and relevant Codes of Practice (Managing Risks of Pla in the Workplace, Managing the Risk of Falls at Workplaces, Construction Work) • Define WHS roles, responsibilities and ac ntabilities senior management, supervisors, maintenance personnel and operators of bar ading age making, coil forming and bundling equipment • Implement a formal WHS policy endorsed by s or leadersh at specifically references prefabrication and reinforcement plant haza (entanglement, c h, cut anual handling, traffic interactions, noise, silica, etc.) • Implement offic de-d nce p cesses (regular WHS performance reviews, legal updates, plant audits) to ens PCBU ob ations being • Establish for consult n mechan (toolbox talks, WHS committee, pre-start meetings) to capture work out on chi y layout, guarding, bundling methods and workflow • Integ te HS ob tives and KPIs into management performance plans, including reduction of plant-re te incident nd near misses • Condu sche uled W S legal compliance audits specifically addressing plant, guarding, isolation, h-risk onstru on work and construction induction requirements	3H
2. Plant Procurement, Design and Guarding of Bar Bending and Prefabrication Equipment	• Purchase or use of machinery that is not fit-for-purpose or non-compliant wi Australian Standards • Inadequate fixed gua ound moving parts on rei cement bar formers, cagemak s and coil formers • Poor design of fe ischa areas creating nip, crush and entanglement points with bars and meshes • Lack of emergency stop devices or poorly positioned e-stops on long production lines • Modification of plant (e.g. adding home-made jigs, rollers or extensions) without engineering assessment • Use of imported second-hand equipment without conformity assessment or documentation • Inadequate guarding around automated tying, binding and bundling mechanisms	4A	• Implement a documented plant procurement and design procedure requiring compliance with WHS legislation and relevant standards (e.g. AS 4024 Safety of Machinery, AS 1657 fixed platforms, walkways, stairways) • Require suppliers to provide declarations of conformity, operator manuals, maintenance schedules and risk assessments for all reinforcement bending and prefabrication machines • Engage a competent engineer or plant specialist to review layout and guarding design for bar benders, cagemakers, coil formers, reinforcing bar formers and automated binding/bundling systems • Specify and verify installation of fixed physical guarding (mesh guards, covers, tunnels) for all rotating, shearing, pinch and crush points, ensuring guards cannot be easily by-passed • Ensure all long-bed bar machines and cage lines have appropriately spaced, clearly marked emergency stop devices and lanyards that are regularly tested • Implement a formal management of change (MOC) procedure for any plant modification, requiring risk assessment, engineering sign-off and updating of documentation and training • Document a commissioning process for new equipment including pre-start verifications, guarding inspections and sign-off before production use	2M

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3. Layout, Workflow and Pedestrian–Plant Interaction in Prefabrication Areas	• Congested work areas around bar bending, cagemaking and bundling lines leading to crush, impact or trip incidents • Uncontrolled interaction between forklifts, cranes and pedestrians during delivery, storage and movement of bars, coils, cages and meshes • Inadequate segregation of coil decoiling areas from general walkways • Poorly planned feed and outfeed zones for long bars, with protruding steel creating impalement and snag hazards • Lack of defined laydown areas for prepared reinforcement bars, cages and bundles, causing disorder and unstable stacking • Insufficient clearance and access around plant for safe maintenance and cleaning	4A	• Develop a facility layout plan that separates pedestrian walkways from vehicle routes and plant operation zones using barriers, bollards and clear line marking • Designate and signpost dedicated loading/unloading zones, coil storage, bar storage and finished cage/bundle laydown areas with exclusion zones around crane and forklift operating areas • Implement a traffic management plan compliant with WHS legislation and relevant guidance, including speed limits, right-of-way rules and spotter requirements in confined areas • Specify minimum clearances around bar benders, cagemakers, coil formers and bundling stations to prevent pinch/impact with fixed structures or other equipment • Mark and enforce controlled feeds for long bars and meshes (infeed/outfeed lanes) to prevent bars projecting into walkways or driveways • Develop stacking and racking standards for reinforcement bars, coils and cages, including maximum stack heights, chocking and bundling requirements • Review layout when new equipment is introduced or processes change, applying the MOC process and consulting workers on practical flow and congestion points	2M
4. Mechanical and Structural Integrity, Inspection and Maintenance Systems	• Failure of moving components (rollers, gears, bearings, clamps) in bar bending and cage forming machines due to poor maintenance • Uncontrolled movement or collapse of jigs, formers, rotating cages and frames • Hydraulic or pneumatic system failure leading to sudden release of energy and movement of components • Deterioration of guards, emergency stops, interlocks and safety devices over time • Failure of racks, stillages and supports used for bars, coils, cages and meshes • Unplanned downtime leading to production pressure and unsafe short-cuts	4A	[redacted]	2M
5. Isolation, Lock-Out/Tag-Out and Energy Control for Plant	• Unexpected start-up of bar bending, cagemaking or bundling machinery	4A		2M

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	during cleaning, jam clearing or maintenance • Stored energy in hydraulic, pneumatic, spring-loaded or tensioned bar systems causing sudden movement • Bypassing or defeating interlocks and guards to speed up jam clearing or adjustment • Lack of clear isolation points or incorrect lock-out procedures across multiple machines in a line • Unauthorised access to control panels and reset functions		[redacted]	
6. Workforce Competency, Training and Supervision	• Operators and offsiders lacking formal training on reinforcement bar bending, cagemaking and bundling machinery • Insufficient understanding of plant hazards, emergency stops, safe shutdown and abnormal conditions • Inadequate supervision of new or labour hire workers in high-risk prefabrication activities • Lack of verification of high-risk work licences, dogging, rigging or forklift tickets where applicable • Failure to provide refresher training following plant changes or incident learnings	4A	[redacted]	2M
7. Manual Handling, Ergonomics and Work Organisation	• Repetitive handling of heavy reinforcement bars, coils, meshes and cages leading to musculoskeletal disorders	3H	[redacted]	2M

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	• Awkward postures when feeding bars into machines, tying cages, or bundling and strapping products • Pushing and pulling of stillages, trolleys and jigs with inadequate mechanical assistance • Poor job rotation leading to sustained static postures or highly repetitive tasks • High production quotas creating time pressure and encouraging unsafe lifting or carrying		[redacted]	
8. Load Handling, Lifting, Storage and Bundling Systems	• Collapse of stacked bars, meshes or cages due to poor bundling, chocking or racking design • Failure of lifting attachments, slings or spreader bars used to move reinforcement bundles and cages • Unplanned movement of loads during crane or forklift handling, crushing and strike risks • Improper bundling or tying of bars and reinforcement cages leading to loads shifting during transport • Inadequate labelling of bundle weights and lifting points on prefabricated cages and meshes	4A	[redacted]	2M
9. Hazardous Substances, Welding, Cutting and Hot Work in Prefabrication	• Exposure to welding fumes, gases and airborne contaminants during fabrication of reinforcement cages, jigs or repairs • Inadequate control of grinding and cutting activities on bars, meshes and	3H	[redacted]	2M

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	cage components leading to sparks and eye injuries • Poor management of flammable materials and ignition sources near bundling and packaging materials • Lack of formal hot work control when modifying plant, jigs or cages in production areas • Inadequate ventilation in enclosed or partially enclosed fabrication spaces		[redacted]	
10. Noise, Vibration and Environmental Conditions in Prefabrication Facilities	• High noise levels from bar bending, shearing, cagemaking, coil processing and impact of bars and meshes • Whole-body or hand-arm vibration fr operating certain plant or hand tools used in cage fabrication a bar preparation • Environmental e emes (heat, cold, wind) in semi-encl ed yard concentration and fa • Poor lighting around machines, st age racks and bundling areas leadi trips, mis-reading gauges misjudging distances	3H	[redacted]	2M
11. Fatigue, Rostering and Production Pressure Management	• Long shifts, overtime and night work for operators and supervisors in reinforcement prefabrication and bar bending areas • Inadequate rest breaks during high-volume production periods leading to reduced attention and slower reaction times • Production deadlines driving unsafe short-cuts such as bypassing guards,	3H	[redacted]	2M

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	rushing bundling or working without proper supervision • Insufficient staffing levels to safely operate multiple machines, load/unload and manage yard traffic		[redacted]	
12. Contractor, Visitor and Transport Interface Management	• Contract maintenance technicians working on bar bending and cagemaking plant without adequate understanding of site WHS requirements • External transport drivers entering prefabrication or yard areas without induction, walking near moving plant and stacked reinforcement • Third-party steel suppliers unloading coils, bars and meshes with varying safety standards and equipment • Visitors entering restricted zones near operating machine or overhead operations	3H	[redacted]	2M
13. Emergency Preparedness, Incident Response and First Aid	• Delayed response to entanglement, crush or amputation incidents around bar bending and cagemaking plant • Inadequate emergency procedures for fire, structural collapse of racks or major load shifts • Poor access for emergency services vehicles and stretchers within prefabrication and storage areas • Lack of reporting, investigation and corrective action following near misses and minor incidents	3H	[redacted]	2M

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			[redacted]	
14. Documentation, Monitoring, Consultation and Continuous Improvement	• Outdated or incomplete WHS documentation for reinforcement bar pre-fabrication, cagemaking and bundling processes • Failure to review risk assessments, procedures and training following incidents or plant modifications • Inadequate monitoring of WHS performance indicators leading to missed trends in near misses or minor injuries • Poor worker engage[redacted] consultation resulti[redacted] under-reporting of hazards and un[redacted]fe conditions	3H	[redacted]	1L

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

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-of-codes-of-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/forms-and-resources/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

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.

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

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

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