

Brick Manufacturing

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, Legal Compliance and Consultation	<ul style="list-style-type: none"> Lack of documented WHS management system aligned with WHS Act 2011 and WHS Regulations Inadequate senior management commitment and resourcing for WHS in brick manufacturing operations Failure to consult with workers, health and safety representatives (HSRs) and contractors on changes to plant, processes and materials Poor integration of WHS into business planning, procurement and production targets (e.g. prioritising output over safety in kiln and press operations) No systematic review of compliance against relevant Australian Standards (e.g. AS 4024 series for machinery, AS/NZS 4801 / ISO 45001 style systems) Inadequate processes for managing officer due diligence obligations and WHS responsibilities for managers and supervisors Lack of documented, up-to-date WHS policies, procedures and control practice specific to brick and clay manufacturing plant 	4A	<ul style="list-style-type: none"> Implement a certified or structured WHS management system aligned with ISO 45001 and the WHS Act 2011, covering all brick manufacturing activities including presses, kilns, extruders and robotics Define and document WHS governance structure including officer due diligence duties, PCBU obligations and clear WHS responsibilities for managers, supervisors, engineers and contractors Establish formal WHS consultation arrangements (meetings, WHS committee, toolbox meetings) with specific standing items on plant safety, kiln operations, automation and maintenance planning Develop and maintain a WHS legal register identifying all applicable WHS legislation, regulations, Australian Standards and codes of practice relevant to brick manufacturing operations Integrate WHS performance indicators (e.g. lead indicators on inspections, training completion, corrective actions) into executive and production management KPIs Require WHS impact assessments for any proposed changes to clay processing, kiln schedules, presses, robots or packaging systems (management of change process) Undertake annual management review of the WHS management system with documented actions, timelines and accountability Ensure adequate budget allocation for guarding upgrades, ventilation, dust control, noise management, automation safety and fatigue risk controls Maintain documented WHS policies (e.g. plant safety, contractor management, fatigue, drugs and alcohol) and review them at least every two years in consultation with workers 	3H
2. Plant Design, Procurement and Change Management	<ul style="list-style-type: none"> Procurement of brick presses, extruders, cutters, robots and kilns that are not compliant with Australian Standards or lack adequate guarding and safety interfaces Inadequate pre-purchase risk assessment for new or refurbished equipment such as Hampton Extruders, Wallbank Presses, Welko Presses and Bickley Kilns Uncontrolled modifications to plant (e.g. bypassing interlocks, altering guarding, changing control logic) without engineering review 	4A	<ul style="list-style-type: none"> Implement a formal plant procurement procedure requiring pre-purchase WHS risk assessments and verification against AS 4024 series and other relevant standards Require suppliers of major plant (e.g. Bickley Kiln, Welko Press, Hampton Extruder, Bradley Wet Press, Wallbank Press, Freymatic cutter, pack unloading robot, pallet wrapper) to provide conformity documentation, safety circuits descriptions, lockable isolation points and guarding details Establish a management of change (MOC) procedure for any modifications to plant, control systems, guarding or layout, including risk assessment and sign-off by competent engineers and WHS representatives Specify minimum safety features in procurement contracts (e.g. safety PLCs, dual-channel emergency stops, interlocked guards, light curtains, perimeter fencing, safe speed monitoring for robotics and rotating equipment) Maintain a controlled plant register capturing design data, safety categories, functional safety requirements, and modification history for each significant piece of equipment 	2M

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	<ul style="list-style-type: none"> Failure to integrate safety systems when combining equipment (e.g. pug mill feeding extruder, extruder feeding Freymatic cutter and pack robot) Missing or incomplete technical documentation, OEM manuals and functional safety data for imported plant Poor consideration of ergonomics and access for cleaning, adjustments and maintenance at design stage Lack of lifecycle planning for plant replacement, upgrades and decommissioning of obsolete brick presses and kilns 		<ul style="list-style-type: none"> Ensure plant layout and design reviews include ergonomics, safe access, maintenance platforms, emergency egress and segregation of pedestrian/vehicle/robotic zones Include lifecycle cost and safety considerations in procurement decisions, favouring designs that inherently minimise manual handling, dust, noise and exposure to hot surfaces Require OEM training and commissioning reports to validate safety functions before production commencement 	
3. Machine Guarding, Interlocks and Functional Safety	<ul style="list-style-type: none"> Inadequate fixed and interlocked guarding on brick air presses, friction presses, Wallbank and Welko presses, and Hampton extruders Access to in-running nip points, pinch points and crush zones on conveyors, pug mills, Freymatic cutters and pack unloading robots Bypassing or defeating interlocks, light curtains or safety mats through poor design or production pressure Single-channel or non-redundant emergency stop systems across link plant (extruder-cutter-robot-pallet wrapper line) Lack of validation and periodic testing of safety-related control systems (e.g. safety PLCs, interlocks, rope pulls) Inadequate perimeter guarding and access control around the brick pack unloading robot and pallet wrapping machine Uncontrolled access to hazardous areas during cleaning, jam-clearing and set-up activities 	4A	<ul style="list-style-type: none"> Conduct a comprehensive guarding and functional safety assessment of all key plant (presses, extruders, kilns, press areas, cutters, robots, pug mills, conveyors, pallet wrappers) against AS 4024 standards Install engineered fixed guards, interlocked gates and presence-sensing devices (light curtains, sensors) that prevent access to hazardous zones while machinery is capable of movement Standardise dual-channel, fail-safe emergency stop systems integrated across the full production line, including the pack unloading robot and pallet wrapping system Implement formal procedures for isolation, lock out tag out (LOTO) and safe access for clearing jams, maintenance and cleaning, with clear signage at all isolators Introduce a periodic testing program for safety circuits, interlocks, emergency stops and protective devices, with documented results and corrective actions Design guarding to minimise the likelihood of removal or bypass (e.g. tamper-resistant fasteners, safety-rated interlocks, guard position monitoring) Segregate robotic cells and rotating equipment with fixed perimeter fencing, interlocked access doors and defined safety distances Train operators, fitters and electricians in the principles of machine safety, the purpose of interlocks and the risks associated with bypassing controls Ensure safe speed, safe limited movement or jog modes are used with enabling devices for set-up work in robots and presses where necessary 	2M
4. Automation, Robotics and Control Systems Integration	<ul style="list-style-type: none"> Control system failures leading to unexpected start-up or movement of the brick pack unloading robot, pallet 	4A		2M

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	<p>wrapping machine and associated conveyors</p> <ul style="list-style-type: none"> • Poor integration between legacy presses/extruders and newer robotic or automated handling systems • Software changes or updates to PLCs, HMIs or safety controllers without appropriate testing and validation • Inadequate control of operating modes (automatic, manual, maintenance, set-up) allowing unsafe access during motion • Lack of clear responsibility for control system design, configuration management and cybersecurity • Inadequate fault diagnostics leading to unsafe workarounds by operators (e.g. defeating safety devices to overcome nuisance trips) • Loss of control integrity after plant expansions or modifications to the brick handling lines 		<p>[REDACTED]</p>	
5. Materials Handling, Storage and Manual Handling of Bricks and Clay	<ul style="list-style-type: none"> • Ineffective systems for handling heavy and awkward loads such as green bricks, fired bricks and pallets leading to musculoskeletal disorders • Uncontrolled stacking, storage and racking of bricks causing collapse falling objects • Inadequate design and maintenance of mechanical handling equipment (forklifts, clamp attachments, conveyors, cranes) used around brick setting and unloading • Poor layout around the brick setting of green product, pack unloading and pallet wrapping areas creating congestion and unsafe pedestrian-vehicle interactions • Insufficient training and competency assessment for forklift and mobile plant operators 	4A	<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"> Lack of engineering solutions for repetitive manual handling tasks such as brick dipping or rework handling 		[REDACTED]	
6. Clay Preparation, Dust, Silica and Air Quality Management	<ul style="list-style-type: none"> Generation of respirable crystalline silica dust from clay preparation, pug mills, Bradley wet presses, friction presses, extruders and cutting processes Ineffective local exhaust ventilation (LEV) and enclosures around high dust-generating equipment and transfer points Poor housekeeping and dry sweeping leading to re-suspension of fine dust around kilns, presses and brick setting areas Inadequate air monitoring regime to verify compliance with workplace exposure standards for respirable crystalline silica and general dust Inappropriate selection, fit-testing or maintenance of respiratory protective equipment where required Lack of worker health monitoring and surveillance for silica-related illness 	4A	[REDACTED]	2M
7. Kiln Operation, High Temperature and Energy Systems	<ul style="list-style-type: none"> Exposure to extreme heat, hot surfaces and radiant energy from Bickley kilns and associated flues and ducting Uncontrolled release of gas or fuel used to fire kilns, including leaks and ignition sources Failure of kiln safety interlocks, flame detection and gas train safety devices Inadequate management of kiln maintenance, refractory repairs and access to confined or restricted spaces around kiln structures 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> Thermal stress and dehydration for workers operating or maintaining kilns in high ambient temperatures Uncontrolled cooling of hot bricks leading to thermal shock and potential projectile or structural failures in stacking systems 		[REDACTED]	
8. Chemical and Process Safety for Dipping Tanks and Additives	<ul style="list-style-type: none"> Exposure to hazardous chemicals in brick dipping tanks (e.g. coatings, sealants, anti-efflorescence agents) through skin contact, inhalation or splashes Inadequate bunding, containment and spill response arrangements around dipping tanks and chemical storage Improper mixing, dilution or temperature control of dipping solution leading to chemical reactions or off-gassing Absence of up-to-date Safety Data Sheets (SDS) and inadequate risk assessments for new or substituted chemical products Incompatible chemical storage and transfer systems used across the brick finishing processes Inadequate ventilation around dipping tank areas leading to accumulation of vapours 		[REDACTED]	2M
9. Maintenance, Isolation and Contractor Management	<ul style="list-style-type: none"> Maintenance work on presses, extruders, cutters, pug mills, kilns and robots without effective isolation and lock out tag out procedures Unplanned breakdown work under production pressure leading to shortcuts and exposure to live plant, hot surfaces or hazardous energy Poor coordination and supervision of specialist contractors working on kilns, 	4A	[REDACTED]	2M

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	<p>robots, hydraulic systems or high-voltage electrical equipment</p> <ul style="list-style-type: none"> • Inadequate maintenance planning and scheduling resulting in deterioration of safety-critical components (guards, interlocks, brakes, limit switches) • Lack of competence verification for maintenance personnel performing complex tasks on presses and automated systems • Absence of permit-to-work systems for high-risk maintenance activities (working at height, confined spaces, hot work near kilns or combustible dust) 		[REDACTED]	
10. Traffic, Yard Management and Loading Operations	<ul style="list-style-type: none"> • Interaction between forklifts, trucks and pedestrians in brick yards, loading areas and around the brick pack unloading robot output zone • Poorly designed traffic routes, blind corners and inadequate signage around storage of finished bricks and raw materials • Uncontrolled loading and unloading of trucks carrying heavy brick packs and pallets, leading to loss of load and vehicle instability • Insufficient management of external transport contractors and visitors on site • Inadequate lighting of yard areas during early morning, night or poor weather operations • Fatigue and distraction among mobile plant operators due to long shifts and repetitive tasks 	4A	[REDACTED]	2M
11. Worker Competency, Training, Supervision and Behaviour	<ul style="list-style-type: none"> • Insufficient training in the safe use of complex plant such as Hampton extruders, Bradley wet presses, Wallbank and Welko presses, Freymatic cutters and pack robots 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Over-reliance on informal on-the-job training without assessment of competence Inadequate supervision of new or inexperienced workers in high-risk areas like kilns, presses, dipping tanks and robot cells Lack of understanding of WHS obligations, risk controls and emergency procedures among workers and contractors Negative safety culture, tolerance of shortcuts, and production incentives that discourage reporting of hazards or near misses Language, literacy or cultural barriers preventing effective training and consultation 		[REDACTED]	
12. Fatigue, Work Scheduling and Psychosocial Risk Management	<ul style="list-style-type: none"> Extended shifts, night work and rotating rosters in kiln operations and continuous pressing/packing lines leading to fatigue-related decision errors High production pressure resulting in stress, reduced risk perception and increased likelihood of unsafe behaviours Insufficient breaks and recovery time for workers in high-heat environments near kilns and heavy manual handling areas Poor management of psychosocial hazards including bullying, conflict and lack of role clarity in multi-shift operations Lack of systems to identify and support workers who may be experiencing mental health concerns impacting safe performance 	3H	[REDACTED]	2M
13. Emergency Preparedness, Fire, Explosion and Incident Response	<ul style="list-style-type: none"> Fire and explosion risks from gas-fired kilns, combustible dust accumulations and electrical equipment near clay and brick handling systems 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> Inadequate emergency response procedures for kiln incidents, gas leaks, major plant failures or structural collapses of brick stacks Insufficient emergency egress routes and signage around complex plant layouts (press halls, kiln areas, robotics cells, dipping tank rooms) Poorly maintained fire detection and suppression systems, extinguishers and hydrants Lack of coordination with emergency services regarding site-specific hazards such as kilns, gas mains and high-voltage equipment 		<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	
14. Health Monitoring, Injury Management and Continuous Improvement	<ul style="list-style-type: none"> Delayed identification of occupational illnesses related to silica exposure, noise, vibration and heat stress Fragmented or inconsistent incident reporting, leading to underestimation of risk and missed learning opportunities Inadequate system for early intervention and return to work following injuries in brick pressing, handling or kiln operations Failure to analyse trends in near misses, injuries and equipment failures across presses, extruders and robotics Lack of worker involvement in reviewing and improving WHS controls 	3H	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	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>

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/factsheets-and-resources/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.