

Glass Handling Transport and Vacuum Lifting

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 for the task parts. 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 PCBU Due Diligence	<ul style="list-style-type: none"> Absence of a documented WHS management system specific to glass and steel handling, transport and vacuum lifting Failure to identify and comply with WHS Act 2011, WHS Regulations and relevant Australian Standards (e.g. AS/NZS 4801 / ISO 45001, AS 1288, AS 4994, AS 4024, load restraint standards) Inadequate allocation of WHS responsibilities between PCBUs, principal contractors, subcontractors and labour-hire providers No formal consultation mechanisms with workers, HSRs and contractors on glass handling and vacuum lifting risks Lack of system to review incidents, near misses and changes in legislation or standards regarding glass handling and lifting equipment Insufficient resourcing for WHS (budget, competent advisors, time for supervision and training) 	4A	<ul style="list-style-type: none"> Develop and implement a documented WHS management system that explicitly covers glass and steel handling, vacuum lifting, glass storage and transport activities Establish a legal register identifying key WHS Act 2011, WHS Regulation and relevant Australian Standard requirements for glass handling, transport and lifting, and assign responsibilities for compliance Define and document WHS roles, responsibilities and accountabilities for officers, managers, supervisors and workers involved in glass activities, including labour-hire and subcontractors Implement formal consultation processes (toolbox talks, HSR meetings, contractor pre-starts) focused on glass and vacuum lifting risks and controls Introduce structured WHS audit and review program (at least annually) to verify compliance and effectiveness of glass handling and lifting systems Ensure officers exercise due diligence by regularly reviewing WHS performance reports, incident trends, audit outcomes and corrective actions related to glass operations 	3H
2. Competency, Licensing and Training for Glass and Vacuum Lifting Operations	<ul style="list-style-type: none"> Inadequate competency of workers operating glass lifting equipment, vacuum lifting attachments and mechanical handling equipment (e.g. cranes, forklifts, telehandlers) No formal verification of competency (VOC) for operators of vacuum lifters and equipment used for loading and unloading glass from trucks Lack of specific training on spontaneous glass breakage, brittle failure and handling of damaged or laminated glass Insufficient training for workers handling glass fibre mesh, sharp glass edges or steel frames used to support glass 	4A	<ul style="list-style-type: none"> Develop a competency framework for all roles involving glass storage, handling, mechanical lifting, vacuum lifters and load restraint, specifying minimum training and VOC requirements Ensure high-risk work licences and plant operator competencies are verified, recorded and monitored for expiry (e.g. dogging, rigging, crane, forklift where required) Provide task-specific training on glass characteristics, spontaneous breakage modes, handling cracked/damaged glass and de-rating of lifting capacities when using vacuum lifters on various glass types Deliver training on safe handling of glass fibre mesh, sharp materials and steel frames (including cut-resistant PPE requirements and correct manual handling techniques) Train supervisors in hazard recognition for glass lifting operations, including correct sling arrangements, suction cup configurations, exclusion zones and emergency response for glass failures Implement structured site and task inductions for all new and temporary workers, including verification of understanding through checklists or assessments Maintain detailed training records and conduct periodic VOC assessments focusing on practical application of glass handling and vacuum lifting procedures 	2M

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	<ul style="list-style-type: none"> Supervisors not trained to recognise unsafe glass handling and vacuum lifting practices Inadequate instruction for new starters, short-term contractors and labour-hire staff about site-specific glass handling procedures 			
3. Plant and Equipment Design, Procurement and Suitability	<ul style="list-style-type: none"> Procurement of glass lifters, vacuum lifting devices, A-frame trolleys and storage racks that are not fit for purpose or not compliant with relevant standards Use of homemade or modified lifting attachments for glass and steel without engineering verification Incompatibility between vacuum lifters, suction cups and glass types (e.g. coated surfaces, textured glass, curved panels, glass fibre mesh carriers) Lack of redundancy or safety features (e.g. dual vacuum circuits, loss-of-vacuum alarms, emergency lowering systems) on vacuum lifters Inadequate design of glass storage systems leading to risk of panel collapse or unplanned movement Failure to design stillages, stillages and A-frames to withstand dynamic loads during transport 	4A	<ul style="list-style-type: none"> Establish a formal procurement and approval process requiring engineering review and compliance checks against applicable Australian standards for lifting devices, vacuum lifters and glass storage systems Specify that all vacuum lifters, glass lifters, A-frame trolleys and racks must be supplied with design registration or manufacturer certification, rated capacities and instructions for use Ensure vacuum lifting devices are selected based on specific glass types, surface finishes, panel sizes, orientations and environmental conditions, with documented limitations Mandate redundancy features for vacuum lifting systems (e.g. dual vacuum circuits, backup power, audible and visual low-vacuum alarms) in line with risk profile Engage competent engineer to design or approve glass storage racks, A-frames, stillages and truck-mounted frames for stability under expected load conditions Include load restraint and dynamic load considerations in the specification of vehicle bodies, stillages and transport frames for glass and steel Prohibit unauthorised modification or fabrication of lifting attachments; require engineering assessment and re-certification for any essential modifications 	2M
4. Inspection, Maintenance and Testing of Glass Handling and Lifting Equipment	<ul style="list-style-type: none"> Lack of systematic inspection and maintenance regime for vacuum lifters, suction cups, glass lifters, cranes, forklifts, A-frame trolleys and storage racks Degraded or contaminated suction cups reducing lifting capacity and increasing risk of glass release Worn, damaged or corroded mechanical components on lifting frames, slings and spreader bars used with glass 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> No evidence of periodic testing, calibration and tagging of vacuum systems and critical safety devices Failure to identify structural defects or overloading damage on glass stillages, racks, and truck-mounted A-frames Incomplete defect reporting and isolation process for faulty equipment 		[REDACTED]	
5. Glass Storage, Racking and Warehouse Layout Management	<ul style="list-style-type: none"> Inadequately designed or overloaded glass racks, A-frames and stillages leading to collapse or uncontrolled glass movement Poor segregation of glass storage from pedestrian walkways, forklift routes and other operations Insufficient allowance for spontaneous glass breakage or failure of toughened or heat-soaked glass within storage systems Uncontrolled stacking of glass, steel frames or glass fibre mesh rolls creating crush or topple risks Inadequate labelling and inventory control causing unsafe manual retrieval or incorrect handling methods Limited access and egress around glass storage areas, impeding emergency response or increasing collision risks with mechanical equipment 	4A	[REDACTED]	2M
6. Transport Vehicles, Load Restraint and Journey Management for Glass	<ul style="list-style-type: none"> Inadequate design or rating of vehicle-mounted A-frames, stillages and restraint systems for glass transportation Incorrect or insufficient load restraint for large glass panels, bulk glass deliveries and steel support frames Vehicle selection not suited to load dimensions, centre of gravity or road conditions Lack of documented journey management for long-distance or remote-area glass deliveries 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> • Driver fatigue and distraction contributing to transport incidents • Failure to manage environmental conditions (wind, temperature, road vibration) which may exacerbate glass movement or breakage during transit 		[REDACTED]	
7. Mechanical Handling and Crane Operations for Glass and Steel	<ul style="list-style-type: none"> • Poor planning of crane, forklift or telehandler use for loading glass onto A-frame trolleys or trucks • Inadequate lifting studies or lift plans for large, heavy or awkward glass panels and steel frames • Incorrect selection or configuration of lifting gear, spreader bars or glass lifting beams • Lack of designated exclusion zones during mechanical handling, exposing workers to falling or swinging loads • Communication failures between operators, doggers and workers during glass lifts • Over-reliance on manual force to steady or guide glass panels instead of engineered control measures 	4A	[REDACTED]	2M
8. Vacuum Lifter Systems, Use of Suction Cups and Glazing Attachments	<ul style="list-style-type: none"> • Vacuum lifter capacity not matched to glass size, weight or orientation, leading to overload or loss of suction • No formal system for verifying vacuum pressure, cup placement and surface condition prior to lifting • Use of suction cups on incompatible surfaces, such as highly textured, dirty, wet or coated glass 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> • Single-point failure risk due to lack of redundancy or failure alarms on vacuum systems • Inadequate management of vacuum hoses, power supplies and control panels leading to trip, snag or emergency-release hazards • Workers positioned under or in line with suspended glass panels during lifting or installation 		[REDACTED]	
9. Manual Handling and Ergonomic Risk Management for Glass and Related Materials	<ul style="list-style-type: none"> • Systemic reliance on manual handling for moving glass sheets, glass fibre mesh rolls and steel frames due to inadequate mechanical aids • Poor ergonomic design of glass storage and handling equipment, resulting in awkward postures and excessive reach distances • Handling of sharp or broken glass without adequate PPE or engineered protection, increasing risk of laceration • Lack of guidance on safe lifting techniques and maximum acceptable loads for manual glass handling • Inadequate provision of lifting aids for small-lot deliveries, narrow access areas or upper-storey deliveries • Insufficient rotation of tasks contributing to cumulative musculoskeletal strain for glass handlers 		[REDACTED]	2M
10. Contractor, Supplier and Delivery Management for Glass Operations	<ul style="list-style-type: none"> • Inconsistent WHS standards between PCBU, glass suppliers, transport providers and on-site installers • Lack of clarity in responsibilities for loading, securing and unloading bulk glass deliveries • No pre-qualification or vetting of contractors using glass lifters, vacuum lifters or cranes on site 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Inadequate communication of site-specific risks and controls to delivery drivers and subcontract installers Misalignment of procedures for handling damaged glass, rejected loads or late deliveries creating rushed, unsafe practices Insufficient oversight of third-party maintenance providers working on vacuum lifters and glass handling equipment 		[REDACTED]	
11. Hazard Identification, Change Management and Incident Learning	<ul style="list-style-type: none"> Failure to systematically identify new hazards arising from changes in glass product types, panel sizes or installation methods Lack of formal change management when introducing new vacuum lifters, glass storage systems or transport vehicles Under-reporting of near misses and minor breakages involving glass, leading to missed opportunities for prevention Poor investigation quality for glass-related incidents, focusing on worker error rather than system failure No feedback loop to update risk assessments, procedures and training after incidents or identified hazards 	3H	[REDACTED]	2M
12. Emergency Preparedness, Response and First Aid for Glass-Related Incidents	<ul style="list-style-type: none"> Inadequate planning for glass breakage emergencies, including large panel failure during lifting or transport No clear procedures for securing the area after spontaneous glass breakage or dropped loads Insufficient first aid capability for lacerations, crush injuries and eye injuries associated with glass handling Lack of emergency drills for vacuum lifter failure, suspended load incidents or truck rollovers involving glass 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Confusion over communication pathways and authority to stop work following a serious glass incident 		[REDACTED]	
13. Fatigue, Workload, Scheduling and Time Pressure Management	<ul style="list-style-type: none"> Long work hours, high physical workload and repetitive handling of heavy glass increasing fatigue and error rates Unrealistic installation or delivery schedules encouraging workers to bypass safety systems (e.g. pre-lift checks, load restraint procedures) Insufficient rest breaks for drivers transporting glass long distances or for installers completing complex glazing tasks Inadequate staffing levels leading to rushed work, solo handling of glass and poor adherence to team-based controls Lack of formal fatigue risk management within the management system for glass handling operations 	3H	[REDACTED]	2M
14. Workplace Environment, Housekeeping and Traffic Management	<ul style="list-style-type: none"> Cluttered work areas for glass storage, cutting, loading and installation zones increasing trip, collision and breakage risks Inadequate separation of pedestrian and mobile plant traffic in warehouses, loading docks and installation sites Poor lighting or glare affecting visibility when handling or inspecting glass panels and sharp materials Uncontrolled environmental conditions (wind, rain, temperature) during outdoor glass handling and vacuum lifting operations Water, dust or debris on floors and glass surfaces compromising grip, vacuum performance and footing 	3H	[REDACTED]	2M

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			[REDACTED]	
15. Personal Protective Equipment (PPE) Policy and Management	<ul style="list-style-type: none"> • Over-reliance on PPE as a primary control rather than as part of a broader risk control strategy • Inconsistent or inappropriate PPE for glass handling, such as inadequate cut resistance or poor eye protection • Lack of systems to ensure PPE is available, maintained, replaced and correctly fitted • Workers not trained in limitations of PPE when handling glass fibre mesh, sharp glass or steel edges • Non-compliance with PPE requirements due to discomfort, poor selection or weak enforcement 	2M	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	1L

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.