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Complex Lifting and Tandem Lifts

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:	

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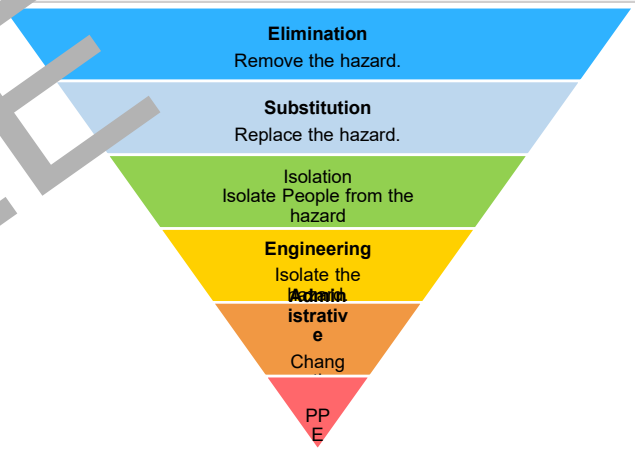
RISK MATRIX

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



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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.*

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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 Duties and Lift Authorisation	• Lack of clear allocation of WHS duties between PCBU, principal contractor, crane company and dogging/rigging subcontractors • Inadequate organisational policy defining what constitutes a complex, critical or tandem lift • Complex lifting activities proceeding without formal written authorisation from competent management • Failure to consult, cooperate and coordinate activities between multiple PCBUs as required under WHS Act 2011 • Inadequate oversight by officers to exercise due diligence in relation to complex lifting risks • Commercial pressures overriding safety decisions (e.g. proceeding despite incomplete documentation or controls)	4A	• Develop and implement a company lifting [illegible]ernance standard defining complex, critical, multiple crane and tandem lifts, aligned with WHS Act 201[illegible]nd releva[illegible]codes of practice • Establish a formal complex lift approval proce[illegible]quiring sign-off by a competent lifting engineer or senior lifting supervisor and the PCBU's authoris[illegible]representa[illegible] • Define and document WHS r[illegible], responsibilities [illegible]d a[illegible]ountabilities for all parties in contract documents, project WH[illegible]plans a[illegible]lifting procedures • Implement a d[illegible]umente[illegible]nsulta[illegible]n, coope[illegible]on and coordination process between all PCBUs involved in li[illegible]n operations including[illegible]re-st[illegible]coordination meetings • Req[illegible]office[illegible]o peri[illegible]ically review complex lifting performance, risk assessments and audit findings as pa[illegible]due dil[illegible]e obligations • Integ[illegible]e[illegible]ing gov[illegible]nance requirements into procurement, tender evaluation and contractor onboarding proces[illegible]s so[illegible]nsafe p[illegible]ctices are screened out [illegible]mplem[illegible]nt a s[illegible]-work authority procedure that empowers any worker to halt a complex lift if WHS co[illegible]ls o[illegible]authori[illegible]sations are not in place	3H
2. Complex Lift Planning and Engineering Assessment	• Complex lifts being tre[illegible]e routine lifts without appropri[illegible]planning depth • Lack of formal e[illegible]neering ass[illegible]ment for unusual loads, [illegible]cent[illegible]grav[illegible] items or non-standard [illegible]ting points • Inaccurate or incomplete informa[illegible]n about load weight, geom[illegible]re of gravity and lifting parameters • Failure to consider dynamic loading, load sharing and potential shock loading in planning phase • Inadequate review of environmental factors such as ground conditions, wind, obstructions and proximity to structures • Complex lifts undertaken without a formal documented Complex Lifting Plan or Lift Study	4A	• Implement a mandatory Complex Lift Planning procedure that clearly defines triggers for a formal engineered lift study (e.g. tandem lifts, lifts over live plant, near power lines, critical assets) • Require a competent lifting engineer to prepare or verify calculations for complex, tandem and multiple crane lifts including load sharing, radius changes and dynamic effects • Standardise the use of a Complex Lifting Plan template capturing load data, rigging configuration, crane configuration, exclusion zones, weather limits, communication methods and contingency actions • Mandate independent verification or peer review of complex lift calculations and lifting plans before authorisation • Require formal pre-lift planning meetings involving engineers, crane operators, riggers, supervisors and the PCBU's WHS representative to validate assumptions and clarify the plan • Establish a document control system ensuring only the latest revision of the Complex Lifting Plan is available at the workface • Integrate geotechnical or temporary works engineering assessments into the planning process where ground bearing capacity or structural supports may be critical	2M

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3. Complex Lifting Plan Documentation and Change Management	• Complex lifting activities proceeding based on verbal instructions without written plans • Use of outdated or superseded versions of the Complex Lifting Plan on site • Uncontrolled alterations to lifting configuration, crane models or rigging gear without formal review • Failure to document and manage mid-lift variations when site conditions differ from the plan • Inadequate distribution and briefing of the Complex Lifting Plan to key personnel • Poor traceability of approvals and changes for auditing and incident investigation	4A	• Mandate that all complex, critical and tandem lifts are supported by a written Complex Lifting Plan that is formally approved before work commences • Implement a revision control system for lifting plans with unique identifiers, version history and digital storage in a central document management system • Establish a formal Management of Change (MoC) process for any alteration to crane selection, lifting radius, load configuration, rigging, or sequence of operations • Require that any mid-lift change or deviation from the approved plan triggers a controlled pause, risk re-assessment and re-authorisation by a competent person • Ensure the latest approved Complex Lifting Plan is displayed at the work area and briefed to all relevant workers via a pre-lift meeting • Audit compliance with lifting plan documentation and MoC procedures as part of regular WHS inspections • Include clear criteria in the plan for when a lift must be abandoned, rescheduled or re-engineered (e.g. wind threshold, equipment faults, site changes)	2M
4. Crane and Lifting Equipment Selection and Procurement	• Selection of cranes or lifting equipment that are unsuitable for complex or tandem lift requirements • Use of cranes without appropriate load moment indicators, rated capacity limiters or anti-collision systems • Insufficient capacity margins for cranes operating near their working load limit during complex lifts • Incompatibility between cranes used in multiple crane or tandem lifts (e.g. differing performance curves or response characteristics) • Procurement decisions based on cost rather than technical suitability and WHS risk • Inadequate verification of third-party crane and equipment certification prior to mobilisation	4A	[redacted]	2M
5. Maintenance, Inspection and Certification Systems	• Inadequate maintenance regimes leading to failure of cranes, winches, hoists or rigging during complex lifts	3H		1L

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	• Expired or missing inspection certificates for cranes, lifting gear, spreader beams and specialised attachments • Reliance on informal or undocumented pre-operational checks by operators only • Failure to remove damaged or non-conforming lifting equipment from service • Poor management of inspection intervals for high-duty or critical lifting components • Lack of traceability for equipment defect reporting and rectification		[redacted]	
6. Competency, Licensing and Training for Complex and Tandem Lifts	• Crane operators, doggers and riggers holding licences but lacking specific experience in complex or tandem lifts • Inadequate training in synchronisation of crane movements a[redacted] sharing principles • Supervisors and [redacted]gineers [redacted] understanding the p[redacted]limitatio[redacted]f lifting equipment and personnel • Lack of formal verification of competency for high-risk [redacted]uch as crane operation near power lines and critical lifting with winches and hoists • Reliance on informal on-the-job training without structured assessment • Insufficient training in emergency response during complex lifts, including mid-lift failures	4A	[redacted]	2M
7. Communication, Coordination and Lift Supervision	• Poor communication between multiple crane operators, riggers, doggers and spotters during complex and tandem lifts • Absence of a dedicated lift supervisor or lift director for critical operations	4A	[redacted]	2M

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	• Inconsistent use of radio channels, hand signals and terminology, leading to misinterpretation • Simultaneous operations in the vicinity of the lift causing distraction or conflicting priorities • No structured pre-lift coordination meetings or toolbox talks for complex lifts • Lack of escalation pathways when disagreements about safety arise		[redacted]	
8. Work Environment, Site Layout and Exclusion Zones	• Inadequate planning of crane locations leading to encroachment on unstable ground, services or structures • Insufficient exclusion zones around cranes, suspended loa[redacted]swing paths • Uncontrolled pub[redacted] or worke[redacted]s into high-risk lifting [redacted] • Overhead hazards such as structu[redacted]s, scaffolding, lighting or trees not considered in layout plan[redacted] • Congested work areas causing interference between multiple cranes, plant and vehicles • Poor lighting or visibility during early morning, night or adverse weather lifts	3H	[redacted]	1L
9. Operation Near Overhead and Underground Services (Including Power Lines)	• Unidentified or poorly mapped overhead power lines and underground services in or near crane operating envelope	4A	[redacted]	2M

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	• Failure to maintain statutory approach distances to energised electrical assets during crane operation • Inadequate control of load drift or boom deflection causing unplanned encroachment into exclusion zones • Lack of formal consultation with asset owners or network operators regarding nearby services • Reliance on informal spotters without specific power line safety training • No contingency planning for power line contact or service strikes		[redacted]	
10. Synchronisation of Crane Movements and Tandem Lift Coordination	• Unequal load sharing between cranes in a tandem or multiple crane lift due to poor synchronisation • Uncoordinated crane movements resulting in side loading, overload or instability • Inadequate monit[illegible]ng of individual crane loads in rea[illegible]me durin[illegible] • Differences in crane [illegible]esponse time, configuration or control systems not accounted for • Lack of rehearsals or dry-runs for complex synchronised movements • Insufficient procedures for controlled stopping, holding and restarting during multi-crane operations	4A	[redacted]	2M
11. Critical Lifting Using Winches, Hoists and Specialised Rigging	• Overloading of winches, hoists or specialised rigging due to inaccurate capacity assessment • Inadequate anchoring or support structures for winch bases and hoist systems	4A	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Complex load paths introducing unexpected side loads or torsional forces on equipment • Lack of redundancy in critical lifting arrangements where failure would have catastrophic consequences • Inadequate monitoring of line tension and equipment condition during critical lifts • Improvised rigging solutions not subject to engineering review		[redacted]	
12. Managing Mid-Lift Alterations and Abnormal Situations	• Pressures to continue a lift when conditions change (e.g. wind increase, equipment fault, unexpected load behaviour) • Ad-hoc decisions to alter crane configuration, rigging or load path mid-lift without engineering input • Inadequate procedures for safely securing or lowering a load if a problem arises during the lift • Confusion among workers as to who has authority to stop, delay or abort a lift • Lack of documented criteria for suspending operations when environmental or site conditions deteriorate • Failure to capture and learn from near misses or abnormal events during complex lifts	4A	[redacted]	2M
13. Fatigue, Work Scheduling and Human Factors	• Complex lifts scheduled at times when workers are likely to be fatigued (e.g. night shift, extended overtime, consecutive long shifts) • Inadequate consideration of cognitive load and stress on operators, riggers	3H	[redacted]	1L

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	and supervisors during high-consequence lifts • Distraction, complacency or overload leading to communication errors or missed cues • Pressure to accelerate lifts to meet program deadlines, reducing adherence to procedures • Insufficient planning for crew rotation during lengthy or staged complex lifts • Poor interface between shift handovers and ongoing lifting operations		[redacted]	
14. Emergency Preparedness and Incident Response for Complex Lifts	• Lack of specific emergency response plans for scenarios such as crane failure, dropped load, power line contact or ground collapse • Emergency equipment (e.g. rescue gear, spill kits, first aid) not readily available or suited to lifting-related incidents • Workers unaware of emergency roles, evacuation routes or communication procedures during a lifting emergency • Delayed notification of regulators and asset owners following notifiable incidents • No provision for technical support or engineering input during incident stabilisation • Inadequate post-incident review to prevent recurrence	3H	[redacted]	1L
15. Contractor and Supplier Management for Lifting Operations	• Engagement of crane companies or rigging contractors with inadequate WHS systems for complex lifts • Misalignment between principal contractor and crane contractor procedures, resulting in gaps or conflicts • Poor verification of contractor competencies, licences and equipment certifications	3H	[redacted]	1L

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	• Commercial contracting arrangements that incentivise risky behaviours (e.g. penalty clauses for delays) • Insufficient monitoring of contractor performance during complex lift campaigns • Lack of clarity on who controls the lifting work area and has authority over safety decisions		[redacted]	
16. Monitoring, Audit and Continuous Improvement of Lifting Systems	• Static lifting procedures that are not updated in line with industry learnings, technology advancements or regulatory changes • Inadequate monitoring of leading indicators such as near misses, deviations from plans and minor equipment failures • Lack of systematic audits of complex lifting activities and associated management systems • Data on lifting perfor[redacted]nd incidents not analys[redacted] to identify systemic weaknes[redacted]s • Workers and contr[redacted]perceiving that reporting issues will lead to blam[redacted] rather than improvement • No structured mechanism[redacted]ntegrate learnings across multiple projects or sites	3H	[redacted]	1L

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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

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