Heavy Infrastructure Bridge and Dam Construction			
Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

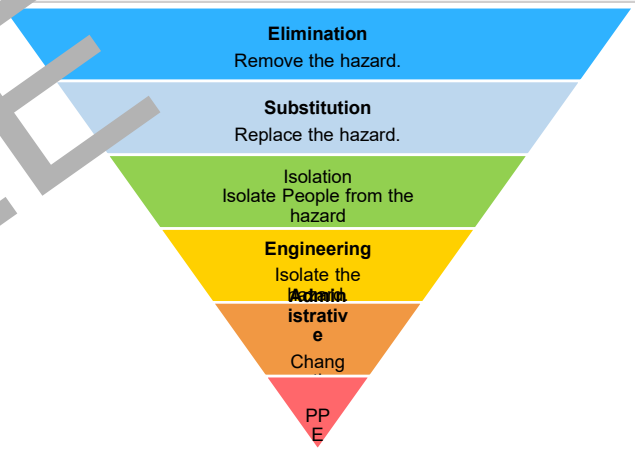
THIS RISK ASSESSMENT IS APPROVED BY THE PCBU OF THE PROJECT		
Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.		
Full Name:		
Signature:	Title:	Date:

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. WHS Governance, Legal Compliance and PCBU Interfaces	• Unclear allocation of WHS duties between principal contractor, designers, subcontractors and suppliers under WHS Act 2011 • Failure to identify and manage overlapping duties between multiple PCBUs on complex infrastructure sites • Inadequate understanding of due diligence obligations by officers and senior management • Outdated or incomplete WHS management system not aligned to current legislation, codes of practice and Australian Standards • Inadequate consultation mechanisms with workers and health and safety representatives (HSRs) • Poor change management for design modifications to bridges, dams, silos, bunkers, arches and smokestacks • Insufficient verification of contractor WHS systems before engagement • Failure to notify and manage notifiable incidents to the regulator	4A	• Establish a documented WHS Management System (WHSMS) aligned with WHS Act 2011, WHS Regulations 2011 and relevant Codes of Practice (e.g. Construction Work, Managing the Risk of Falls, Confined Spaces) • Define and document PCBU roles, responsibilities and accountabilities for all parties (principal contractor, designers, subcontractors, plant hire) in project-specific WHS plans and contracts • Implement an officer due diligence framework including regular WHS reporting to the Board, site visits, and verification of resources, controls and incident learnings • Develop a documented process to identify and manage overlapping duties, including coordination meetings, interface agreements and shared risk registers • Formalise consultation and participation arrangements, including election and training of HSRs, WHS committees and toolbox consultation structures • Implement a structured management of change (MOC) procedure for design and scope changes to bridges, dams, bunkers, silos, domes, spires and pylons, including safety-in-design review • Prequalify contractors and suppliers using a WHS systems assessment, requiring evidence of licences, insurances, training and risk management processes • Maintain a legal register and compliance calendar for regulator notifications, licences, high risk work permits and statutory inspections • Conduct annual independent WHSMS audits and periodic targeted audits on critical risks (e.g. working at heights on spires, smokestacks and arches) • Ensure incident notification and investigation procedures meet regulatory requirements and drive corrective and preventive actions across the project portfolio	3H
2. Design, Safety in Design and Constructability Management	• Inadequate safety in design review for bridges, dams, silos, bunkers, arches, domes and smokestacks • Designs that create unnecessary work at height, over water, or over live traffic • Insufficient consideration of temporary works (formwork, falsework, shoring, pylon supports, cofferdams) • Complex structural geometries (domes, arches, spires) increasing erection risk without engineered erection methodology • Lack of whole-of-life considerations for inspection and maintenance access to bridges, dams, silos and smokestacks	4A	• Implement a formal Safety in Design (SiD) process in line with WHS Regulations and relevant Australian Standards, including multi-disciplinary design risk workshops • Mandate designer safety reports identifying residual construction and operational risks for all major structures (bridges, dams, silos, bunkers, towers, spires) • Integrate constructability reviews at key design stages to minimise work at height, heavy lifts and over-water work through prefabrication and modular construction where practicable • Require engineered temporary works designs (formwork, falsework, scaffolds, earth retaining systems, cofferdams, pylon supports) with verification and sign-off procedures • Ensure design includes permanent safe access provisions (ladders, platforms, walkways, anchor points) for inspection and maintenance of bridges, dams, silos, smokestacks and domes • Use robust geotechnical investigation and modelling to inform earth fill dam, foundation and excavation design, including slope stability and settlement • Specify standardised connection details and lifting points for arches, girders, silo components and spire sections to support safe erection sequencing	2M

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	• Poor geotechnical characterisation leading to instability in earth fill dams, foundations and retaining structures • Designs not compatible with standard plant, access systems or prefabrication methods • Inadequate drainage and flood design increasing risk of sudden inundation at dam and bridge works		• Incorporate hydrological, flood and spillway analyses to reduce risk of sudden inundation of dam works, coffer dams and bridge abutments • Implement a formal design change control process with risk assessment and constructability review for all revisions impacting safety • Document residual design risks in project risk registers and communicate them clearly to constructors and maintainers	
3. Project Planning, Programming and Staging	• Compressed programs driving unsafe sequencing of bridge and dam works • Concurrent high-risk activities (lifting, working at height, excavation, concrete pours, blasting) without integration • Insufficient planning for seasonal weather, flooding and high wind during assembly of arches, domes and spires • Poor traffic and public interface planning around footbridges, in-place bridge construction and infrastructure works • Inadequate resourcing leading to fatigue and rushed work • Inadequate allowances for commissioning, proving and rectification of dams and bridge structures • Lack of contingency planning for critical path activities such as major concrete pours and pylon erection • Failure to coordinate with third parties (utilities, rail, road authorities, water authorities) impacting site safety	4A	• Develop an integrated construction program that sequences high-risk activities to minimise overlap and allow adequate set-up and inspection time • Undertake formal construction planning workshops including engineering, HSE, supervisors and key subcontractors to identify and manage staging risks • Factor in seasonal weather patterns, river levels and wind data when planning dam works, bridge lifts, spire assemblies and tall smokestack construction • Create project-specific traffic management and public protection plans for in-place bridge construction, footbridge assembly and works over roads, rail and waterways • Plan and budget for adequate staffing, supervision and rest breaks to manage fatigue and workload, including night work and remote operations • Include hold points in the program for critical inspections (formwork, reinforcement, anchorages, post-tensioning, dam cores) prior to pours and backfilling • Prepare contingency plans and alternative methodologies for critical operations such as major lifts, river diversions and spillway works • Coordinate early and formally with asset owners and regulators (road, rail, water, power, communications) for approvals, shutdowns and isolations • Review program risks regularly at management meetings and update the risk register with treatment actions • Align procurement and logistics planning with construction stages to avoid last-minute changes and unsafe improvisation	2M
4. Contractor, Subcontractor and Supplier Management	• Engagement of contractors for high-risk bridge, dam, silo and smokestack works without adequate WHS capability • Inconsistent safety standards between multiple subcontractors on large infrastructure projects • Insufficient verification of high risk work licences (cranes, rigging, dogging, confined spaces, explosives)	4A	[redacted]	2M

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	• Poor communication of client and principal contractor WHS expectations in contracts and site inductions • Supply of non-compliant structural components, formwork systems or lifting gear • Inadequate supervision of specialist subcontractors performing complex tasks (post-tensioning, pylon erection, dome works) • Lack of effective performance monitoring and consequences for poor WHS performance		[redacted]	
5. Competency, Training and Supervision Systems	• Workers undertaking critical dam and bridge construction tasks without verifie competency • Supervisors lacki skills in risk management for la e stru as arches, domes ar ures • Insufficient training on project-spe ic risks (water retention, hyd static pressure, structural stabilit tall structures) • Inadequate mentoring of new or young workers on remote and high-risk infrastructure sites • Poor communication and language barriers within multi-lingual workforces • Lack of ongoing refresher training for high-risk work and emergency response	4A	[redacted]	2M

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6. Major Plant, Lifting and Temporary Works Management	• Failure of cranes, winches or lifting equipment during erection of girders, arches, pylons, domes, spires and smokestacks • Inadequate design, inspection and maintenance of temporary works (formwork, falsework, shoring, scaffolds, earth retaining structures) • Uncontrolled interaction between heavy mobile plant and workers in congested dam and bridge sites • Unverified lifting points on precast bridge segments, silo panels and pylon sections • Insufficient planning for complex multi-crane and over-water lifts • Inadequate control of plant on unstab ground near earth fill dams, embankments and excavations	4A	[redacted]	2M
7. Structural Stability, Geotechnical and Hydrological Risk Management	• Partial structural collapse of brid s, arches, domes, spires or tacks during staged construction • Instability of earth fill dams, embankments and cofferdams due to poor compaction, seepage or unexpected ground conditions • Uncontrolled water inflow, overtopping or flooding impacting dam sites, abutments and footbridge works • Inadequate monitoring of ground movement, settlement or structural deflection during construction	4A	[redacted]	2M

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	• Failure to maintain required construction sequences for structural stability • Unmanaged hydrostatic pressure behind retaining walls, dams and silos		[redacted]	
8. Work at Height, Access and Fall Protection Systems	• Falls from height during construction of bridges, footbridges, pylons, domes, silos, arches, spires and smokestacks • Inadequate design, inspection or maintenance of access systems (stairs, ladders, scaffolds, edge protection) • Objects falling from height onto workers or public below • Insufficient engineered anchor points and fall arrest systems [redacted] complex structures • Rescue difficulties [redacted] over-water work ar[redacted] • Uncontrolled access to incomplete unsafe elevated work platforms	[redacted]	[redacted]	2M
9. Confined Spaces, Enclosed Structures and Hazardous Atmospheres	• Entry into confined spaces such as silos, grain bunkers, dam galleries, culverts, shafts and internal smokestacks without controls • Accumulation of toxic or asphyxiating gases in enclosed spaces and formwork voids • Engulfment hazards within grain storage bunkers and silos	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
	• Limited access and egress from internal spaces in bridges, domes and dams • Use of solvents, coatings and welding processes in confined or poorly ventilated spaces • Inadequate emergency rescue capability for confined space incidents		[redacted]	
10. Traffic, Public Interface and Third-Party Protection	• Vehicle collisions and plant interactions on and around bridge and dam sites • Unauthorised public access to construction zones, particularly at footbridges and urban infrastructure • Impact to existing road, rail and marin traffic during in-place brid onstructio and pylon assembly • Loss of loads or terials from height onto public or third rty a • Insufficient coordination with emergency services and local auth ties regarding changed traffic ndit s • Dust, noise and vibration from infrastructure work affecting neighbouring communities	4A	[redacted]	2M
11. Environmental, Hazardous Substances and Health Exposure Management	• Exposure to cement dust, silica, welding fumes and coatings during infrastructure construction • Use of hazardous chemicals such as form release agents, protective coatings and grouts in confined or poorly ventilated areas	3H	[redacted]	2M

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	• Noise-induced hearing loss from piling, concrete batching, demolition and heavy plant • Manual handling injuries associated with heavy reinforcement, formwork and precast components • Water contamination from concrete washout, fuels and lubricants near dam and bridge works • Heat stress and cold stress during prolonged outdoor work on dams and bridges		[redacted]	
12. Remote and Isolated Work, Emergency Preparedness and Rescue	• Delayed emergency response for remote dam sites and bri[illegible]rojects in regional areas • Inadequate emer[illegible]ency planning for structural collapse, [illegible]odin[illegible]trap[illegible]nt or falls from height • Insufficient communications cove[illegible]ge for workers on large linea[illegible]f[illegible]ucture and dam embankments • Lack of coordinated rescue capability for over-water work, confined spaces and tall structures • Poor worker familiarisation with emergency procedures and muster locations • Failure to plan for extreme events such as rapid inundation, seismic activity or major structural failure	4A	[redacted]	2M

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			[redacted]	
13. Fatigue, Psychosocial and Workforce Welfare Management	• Fatigue from long shifts, remote rosters and night works on major infrastructure projects • Stress and psychosocial risk associated with high-pressure deadlines, complex engineering tasks and remote accommodation • Impaired decision-making by supervisors and operators working prolonged hours on critical activities (lifts, dam works, traffic switches) • Inadequate facilities and welfare arrangements impacting health, hygiene and morale • Substance misuse or fitness-for-work issues not being effectively managed	3H	[redacted]	2M
14. Documentation, Information Management and Communication	• Workers and supervisors using outdated drawings, specifications and procedures • Critical safety information about dams, bridges, silos and temporary works not being communicated effectively • Loss of records relating to inspections, certifications and monitoring for high-risk structures • Inconsistent handover of information between design, construction and operations teams • Miscommunication between shifts, workfronts and subcontractors on large infrastructure sites	3H	[redacted]	1L

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			[redacted]	

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