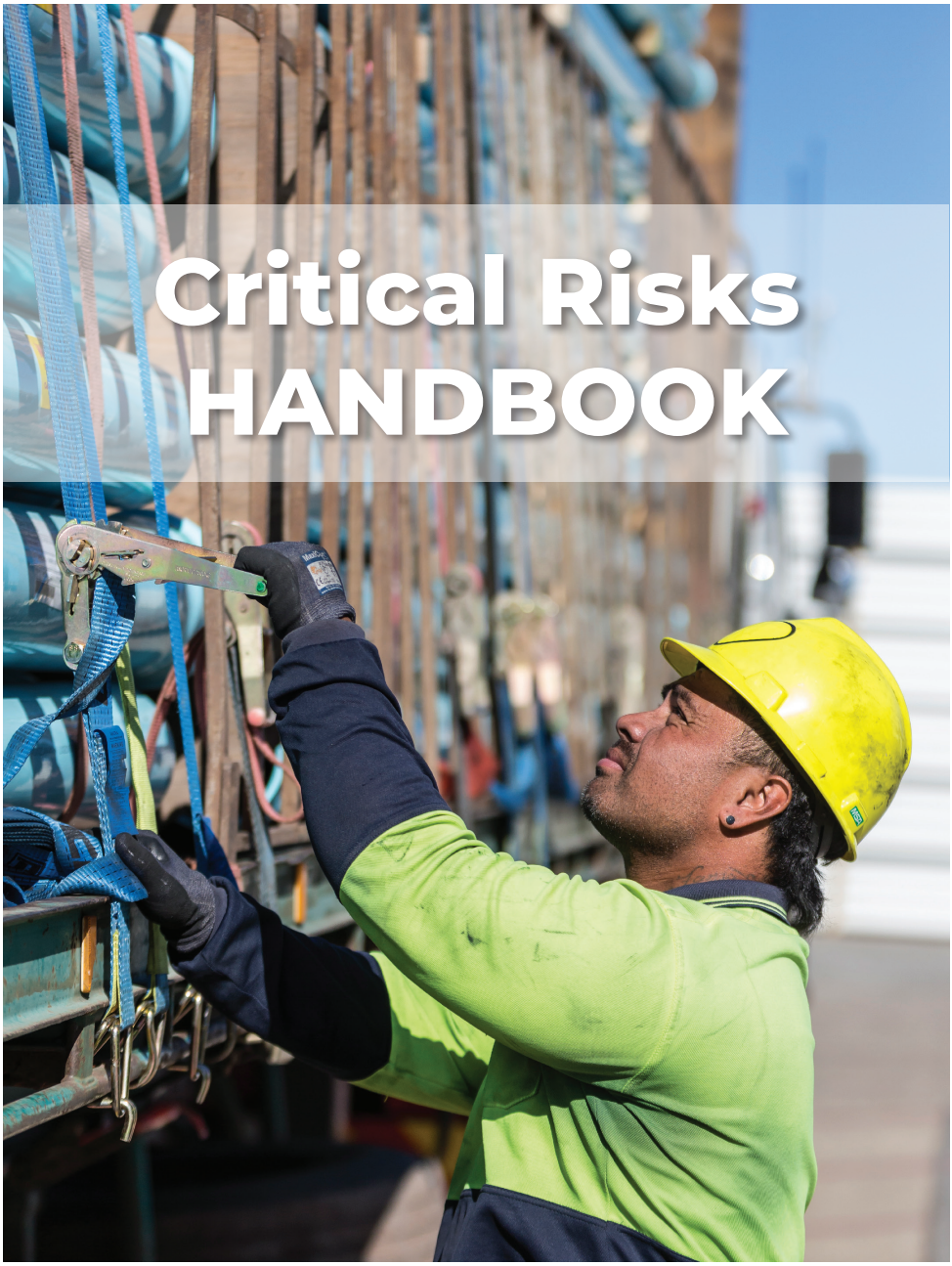

Critical Risks HANDBOOK

Risk Leadership

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Introduction

As leaders we are committed to doing all we can to protect people and the environment from harm, and to promoting a healthy working environment with a culture of continuous improvement.

As part of this, we are committed to effective, disciplined risk management and actively using risk mindfulness and the tools available to us to help keep our people and our sites safe, healthy and prevent pollution.

Our focus on our Critical Risks – those things which can cause serious harm, regardless of consequence – helps us focus on the things that matter and get confidence that they are managed correctly and confidently on site.

This handbook is intended to provide leaders with:

- An overview of the key principles of our critical risk framework.
- Tips and tricks for lifting our risk mindfulness and verification activities.
- All FB Critical Controls and performance requirements for quick reference.

Use this handbook to help you continue to lift our management of Critical Risks and our risk mindfulness practices:

- Are we focused on the dangerous stuff?
- Are we managing our critical controls effectively?
- What are the opportunities to eliminate risks?
- Can we further embed critical controls and practices into operational practices?
- Are we staying curious and asking, 'what if'?
- Are we celebrating when we fix controls and potentially saving a life?

Through our Risk Leadership practices we continue to drive our commitment to zero injuries and an interdependent culture where risk management and critical controls are fully integrated into work processes

Thank you for your commitment, your risk mindfulness, and your relentless focus on what matters.

Critical Risks

Our Critical Risks were chosen based on benchmarking with best practice in our industry as well as a review of our own history and exposures to safety, health and environmental risks which have the potential for serious harm in our businesses.

Our 21 Critical Risks are broken down into 3 key groups:

- **Safety risks** – these are known in our industry or in some of our businesses to cause fatal or life altering injuries.
- **Health risks** – these are known in our industry and based on our own history to cause the most chronic and acute harm as a result of exposure to substances, materials or chemicals.
- **Environmental risks** – this top event is the cause of the majority (70%) of our environmental incidents.

Getting on top of these risks which save lives today and tomorrow as well as protect the environment in which we work.

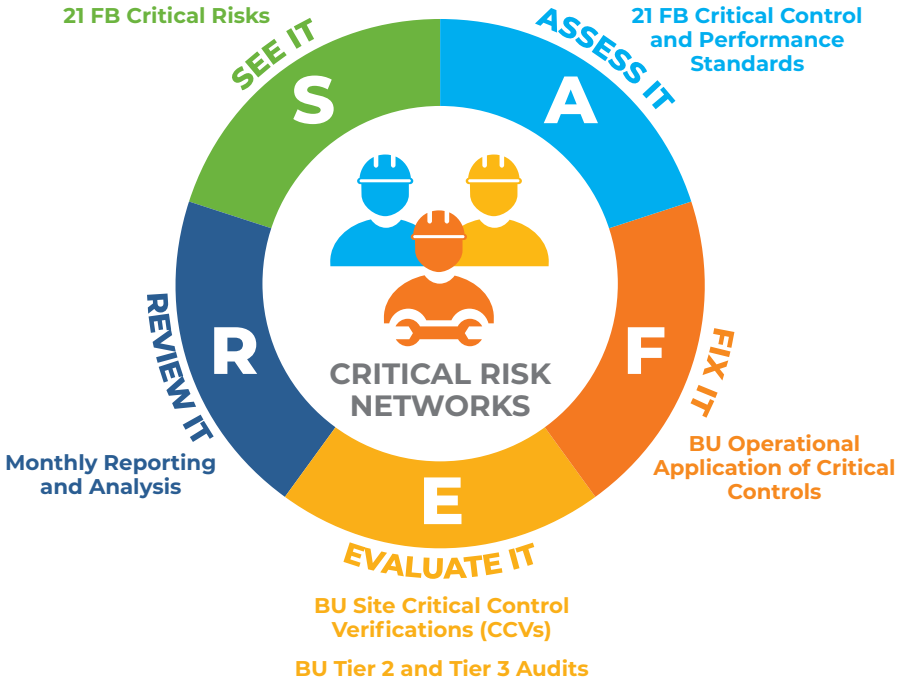
			Fatalities (2001 to 2019)	Life Altering (FY15 to FY21)	Potentially Fatal (FY18 to FY22)	Company Benchmark
Safety	CR01	Fall from heights	5	5	27	Yes
	CR02	Vehicle collision or roll over	4	5	20	Yes
	CR03	Failure of lifting operations	4	1	16	Yes
	CR04	Entanglement, impact or crushing	1	1	24	Yes
	CR05	Struck by mobile plant	1	3	1	Yes
	CR06	Objects falling from heights	0	3	21	Yes
	CR07	Contact with electricity	0	0	21	Yes
	CR08	Working in confined space	1	0	1	Yes
	CR09	Working beside live traffic	3	0	20	Yes
	CR010	Contact with underground services	0	0	10	Yes
	CR011	Building or structure failure	2	1	1	No
	CR012	Hot work and fire	0	0	2	Yes
	CR013	Collapse of excavation or stockpile	0	0	1	Yes
	CR014	Explosives	0	0	1	No
	CR015	Working near or over water	0	0	0	Yes
	CR016	Exposure to process safety risks	0	0	3	No
Health	CR017	Exposure to hazardous substances	0	0	0	Yes
	CR018	Exposure to dust and silica	0	0	1	Yes
	CR019	Exposure to asbestos	0	1	22	Yes
	CR020	Exposure to noise	0	37	0	Yes
Enviro	CR021	Discharge to land, air, or water	Responsible for 70% of our environmental incidents			No

Critical Risk Management

At Fletcher Building we are committed to the systematic, structured, and timely management of our EHS Risks that we face as a business.

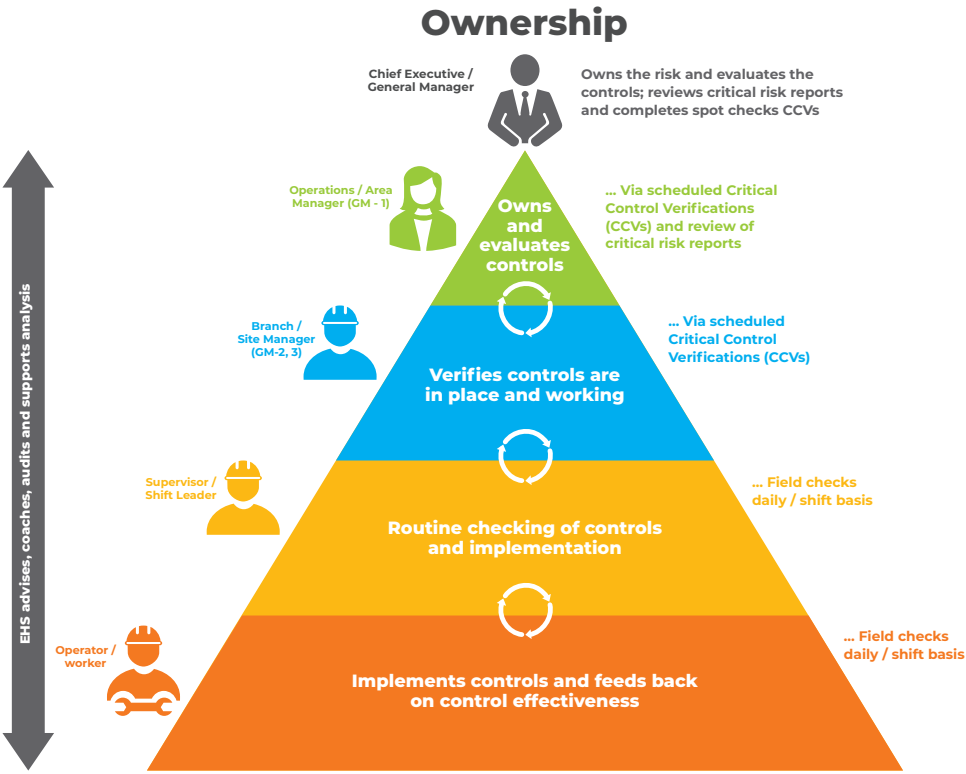
Our Critical Risk Management framework is a critical control management approach. In this way, we focus on the specific controls required to prevent or minimise an event from occurring.

There are 5 key steps to Critical Risk Management, core to this are our Critical Controls. These are represented in the SAFER model:



Critical Risk and Control Management

Everyone has a part to play in ensuring that risks are effectively managed and controlled.



Critical Controls

Our Critical Controls were developed using industry best practices and regulatory compliance requirements. We also incorporated our own knowledge, stories, and understanding of our risks and controls.

Our Critical Control Verification practice builds on our risk containment practices and helps us focus on the few controls that are critical to saving a life.

A critical control is a highly relied upon control that is crucial in preventing the occurrence of an unwanted event or mitigating the consequences of the unwanted event if it did occur. The absence or failure of a Critical Control would significantly increase the risk.

Each Critical Control has several Performance Requirements. Not all Critical Controls and not all performance requirements will apply in your business. Business Units will have their own Critical Control Verifications and cards that meet the Performance Requirements.

RISK CONTAINMENT

Wide scope: hunting out the dangerous stuff and containing it.

What stays the same?

- Keep your focus on the critical stuff – the things that can kill or seriously injury someone.
- Don't think about whether it is likely to happen or not.
- Talk to workers to understand the task or work.
- If something doesn't feel right, it probably isn't. Don't walk past. Stop, take action.
- Discuss any solutions with the site manager or supervisor and get agreement on actions.
- Do not leave the risk uncontained. If a critical control is missing, there must be an interim control in place while a permanent fix is worked out.
- Embrace the red – if you found something, you may have just saved a life. That's a good thing.
- Celebrate the good stuff – if you find controls in place, celebrate that, and thank the team for their good work.

CRITICAL CONTROLS

Narrow scope: focusing on the one thing that will save life.

Safety Leadership Tool

	Leader Walk	Risk Containment	Critical Control Verification
What is the purpose?	Check your workplace culture, interact with your frontline and build your leadership.	Identify and immediately correct high risk activities, acts or conditions to help set standards and contain risk.	Check and verify that known critical controls you are relying on are in place and strong.
Who should use this most?	All leaders with responsibilities over others.	Managers or supervisors building confidence in their risk mindfulness; leaders with oversight of dynamic sites, new businesses or JVs.	Supervisors and managers with responsibility for risk on site; leaders with oversight / ownership of risk.
When should you use it?	Regularly and as part of a normal leadership routine.	As scheduled or as required: to build risk mindfulness; or on dynamic sites; or where we have governance but limited control.	As scheduled or as required: during a work activity / time of year when the risk is known to be present; for routine coverage of all active risks; or as directed based on targeted focus / concern.
How long can it take?	30 min – 1 hr	1 - 3 hr depending on site	30 min to 3 hours
How do you do it?	Observation based interaction; giving feedback and engaging with the team.	Sweep over a site hunting out “at risk” acts and conditions; contain risks and classify their level of potential consequence (S1 to S4).	Use checklists to record presence or absence of specific controls to identify opportunities for improvement and focus effort to mitigate exposure.

Steps to complete a Critical Control Verification (CCV)

CCV's are completed just like a Leader Walk or Risk Containment Sweep. What's new is the focus on Critical Controls and completing a verification checklist to confirm if they are in place or not.

Step 1

Confirm Scope

1. If you are focused on one Critical Risk, confirm the Hazardous Activities relevant on site; or
2. If you are verifying against a Hazardous Activity you see on site, confirm the Critical Risks associated with the Hazardous Activities you will be observing

Step 2

Observe and Learn

Observe for at least 10 minutes; Talk to the team to understand how work is done

Step 3

Critical Controls

Use Roam or Radar (paper copies available on site) to verify that applicable Critical Controls are in place (yes) or (no)

Step 4

Get Commitment

If Critical Controls are missing, get commitment for interim controls to contain the risk and a plan for long-term solutions

Step 5

Thank You

Take time to say thank you and celebrate the good stuff

Tiered Approach to CCVs

The majority of our CCVs are simple, visible performance requirements that anyone can check on site at any time. These are called Site CCVs and completed by leaders.

However, there are some equally important CCVs which are more “audit” style (Tier 2) or require experts (Tier 3) to review. These are typically done less frequently than Site CCVs, are often desktop exercises and require more time to be completed.

	Fix It - Performance Requirements	Evaluate It - Critical Control Verifications
Tier 1 Operational	These are visible controls that can be checked on site (e.g., Out of Service tags on equipment).	**Site CCVs** • Completed monthly as per BU schedule, covering all risks & sites annually • Completed by managers & supervisors • A sample of Site CCVs are also completed by EHS annually as part of the wider quality assurance
Tier 2 Internal BU (independent from operations)	These are management system controls that require a desktop review (e.g., scheduled maintenance for safety devices).	**Tier 2 CCVs** • Completed as per BU schedule, covering all risks annually • Completed by EHS or independent, technically competent managers
Tier 3 External to BU (internal independent or external)	These are highly technical controls that require third party specialists (e.g., machinery safety assessments). note: there are only 7 of these across 21 Critical Risks	**Tier 3 CCVs** • Completed as per BU schedule • Completed by EHS or independent, technically competent managers

More ↑ Frequency ↓ Less

Finding and Actions

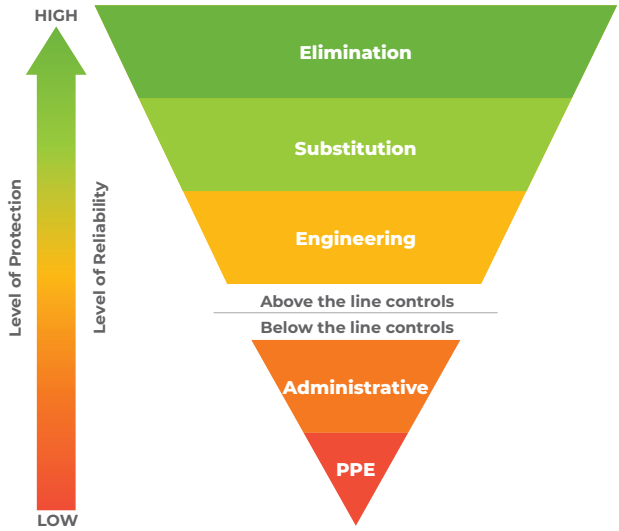
If a control is missing or inadequate, it's important to make it safe and then get commitment for a long-term solution.

Embrace the red – if you hadn't found it, we couldn't fix it and someone's life may have been at risk.

STEP 1 Make it safe immediately.

STEP 2 Implement controls (add these to Radar/Roam)

STEP 3 Opportunities – ideas for eliminating the risk (add these to Roam/Radar).



Elimination
Remove the hazard/ the need for the hazardous process.

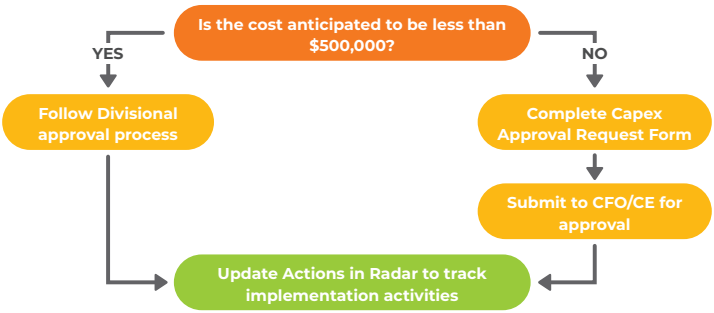
Substitution
Compartmentalize or reduce the severity of the hazard.

Engineering
Engineer a safer solution such as a guard barrier, use transport machinery instead of lifting etc.

Administrative
Track and audit maintenance, ensure training/qualification occurs beforehand.

PPE
Provide or improve personal protective equipment such as gloves, helmets, goggles etc.

Remember if this requires investment, we need to know about it – even if you think you've asked before, be curious and ask again.



Risk Mindfulness

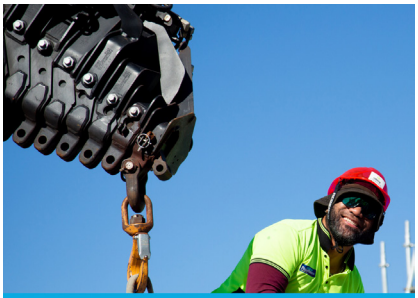
Risk mindfulness is a risk leadership practice that is founded on the belief that all injuries are preventable, and all operating exposures can be safeguarded.

This mindfulness practice includes adopting a sense of Chronic Unease and a strong focus on our high consequence risks, regardless of how likely they are.

	Consequence				
Likelihood	**Insignificant**	**Minor**	**Moderate**	**Major**	**Substantial**
Most certain	MEDIUM	HIGH	VERY HIGH	VERY HIGH	VERY HIGH
Likely	LOW	MEDIUM	HIGH	VERY HIGH	VERY HIGH
Possible	LOW	MEDIUM	HIGH	VERY HIGH	VERY HIGH
Unlikely	LOW	LOW	MEDIUM	HIGH	VERY HIGH
Rare	LOW	LOW	LOW	HIGH	HIGH

Asking 'What if' is a part of Chronic Unease. The best safety leaders adopt a sense of Chronic unease as a core part of their risk mindfulness.

Chronic Unease is the opposite of complacency. It is the feeling of being uncomfortable about risk and is about inquiry and probing deeper. We need to really understand the risk and exposures, and not just assume that everything will be fine because systems are in place.



Stay alert

Worry about risk

Anticipate failure

Visualise the worst case scenario

Be flexible in your thinking

Celebrate success

CCV Preparation Checklist

Your ability to deliver an efficient & effective risk control verification check depends on....

Check lists:

Preparation

- Choose your critical risk area and site
- Notify site Responsible Person(RP)
- Organize appropriate site access
- Supervisors / frontline to join?
- Review the specific risk controls & their performance requirements
- Imagine / discuss some possible risk scenario's you expect to see
- **Check all your PPE and be mindful of your own safety**

Verification

- FOCUS in the moment-mindfulness
- Pause, observe the hazard(s) and risks
- FOCUS on presence of risk controls and their performance requirements
- Discuss and correct failings; don't get distracted by the interactions
- Determine compliance performance
- Where there are significant failures or gaps, explore and record comment
- Brief site RP on completion
- **Record all CCV findings in Radar**

Mindset

- Checking compliance to the application of critical risk controls is IMPORTANT to you and the company
- We need to know where we are failing or where there are gaps
- Don't walk past, speak up, take action
- Embrace the RED
- Positively reinforce, appreciate and recognize those doing risk control verifications
- **Failings in the application of risk controls will be fixed and possibly contribute to saving a life in future**

Top 6 Critical Risks

CR01
FALL FROM HEIGHTS

CR02
VEHICLE COLLISION OR ROLLOVER

CR03
FAILURE OF LIFTING OPERATIONS

CR04
ENTANGLEMENT OR CRUSHING

CR05
STRUCK BY MOBILE PLANT

CR06
OBJECTS FALLING FROM HEIGHTS

CR01 FALL FROM HEIGHTS

These controls are critical to prevent the loss of balance of a person.

Fall Prevention

Critical Control CC01-01

Control Objective: Prevents workers from falling from one level to another (either above ground or below ground).

1. All fall edges (including excavations) must be protected by a physical barrier of sufficient height (e.g., 1100 mm) and strength that prevents a person from falling. (Tier 1)
2. Handrails, penetrations, shafts and rises must be covered / protected, clearly identified, and securely fastened to prevent a person from falling. (Tier 1)
3. Where a fall restraint system is in use, ensure the restraint lanyard in use is of a maximum length so it prevents the person from reaching the exposed edge. (Tier 1)
4. All fall restraint equipment (e.g., lifelines) must be checked by a competent person before use. (Tier 2)
5. Work Positioning Systems have been designed and established by a competent person. (Tier 2)

Fall Arrest

Critical Control CC01-02

Control Objective: Mitigates the impact if a worker falls from one level to another.

1. Fall arrest systems must only be used when fall restraint is not practicably possible. (Tier 1)

2. All fall arrest equipment and abseil anchors must be checked before use by a competent person. (Tier 1)
3. Fall arrest systems must include shock absorbers and must be appropriate for the weight of the individuals and minimise the fall distance to ensure no contact with the ground. (Tier 1)
4. A rescue plan must begin place (and trialled) specific to the activity being undertaken; the plan must include appropriate and tested rescue equipment (including communication method); all persons involved in the activity must be trained and aware of the requirements / contents of the plan. (Tier 2)

Equipment or Structure Integrity

Critical Control CC01-03

Control Objective: Prevents equipment or structural failure when a worker is working at height.

1. Where working at height (or walking past an unprotected height) is required, surfaces or work areas must be assessed by an Engineer to ensure they are safe and appropriate controls (including monitoring) put in place. These assessments and any controls required must be documented. (Tier 2)
2. Appropriate design and / or certifications must be completed to ensure barriers, scaffolding, screens, penetration covers, anchor points and working platforms used are safe and fit for purpose. These must be recorded in a Register. (Tier 2)

Height Access Equipment

Critical Control CC01-04

Control Objective: Ensures people required to access areas at height have a safe means to do so.

1. Scissor lifts must only be used on level ground or within manufacturers specifications. (Tier 1)
2. Cherry pickers or boom style Mobile Elevated Work Platforms (MEWP) must be used where the ground is not level; these must be used with a safety harness with adjustable lanyard and short energy absorber connected to a manufacturer's anchor point. (Tier 1)
3. Where MEWPs are used, a physically demarcated exclusion zone from all other activities (including LOTO of gantry cranes or other overhead work) must be established or a spotter used. (Tier 1)

4. When the height of the scaffold is more than three times the width of the base, the scaffold must be tied to the supporting structure if not rakered or buttressed. (Tier 1)

5 Platforms (or other safe access) are provided for transport truck loading / unloading where operators need to access a truck deck. (Tier 1)

6. All scaffolding up to 4 meters (Australia) and 5 meters (NZ) in height must be assembled, maintained, inspected, and disassembled by a competent person (licenced, certified scaffolder). (Tier 2)

7. Temporary access platforms must have an engineer approved design and / or certification, be structurally sound, free of defects. (Tier 2)

Competency

Critical Control CC01-05

Control Objective: Ensures persons involved in work at height activities are competent to perform their tasks.

1. Persons using fall arrest systems, issuing and receiving Permits to Work, using height access equipment, or assembling, maintaining, certifying or dismantling scaffolding must be trained to the appropriate industry standard and deemed competent to be able to perform the activity. (Tier 1)

CR02 VEHICLE COLLISION OR ROLLOVER

These controls are critical to prevent the Loss of Control of a Vehicle.

Load and Product Restraint

Critical Control CC02-01

Control Objective: Ensures material is secured to the vehicle or transporter and will not come loose in transit.

1. Loads must not exceed weight limits and specifications of truck and trailer and angle of operation for loading / unloading must not exceed machine specifications. (Tier 1)
2. The lashings (e.g., ropes, webbing or chains) used must be inspected annually, tagged with load limits, be in good condition and evenly distributed along the load to restrain material from moving during transit. (Tier 1)
3. Chains must be used for transporting heavy loads (e.g., >2 t) and mobile plant. Restraint methods (e.g. belly, cross over) and dunnage placement must ensure load is fully secured to prevent movement. (Tier 1)
4. Loads must be distributed to give correct axle distribution and an even weight distribution over the floor area and the centre of gravity of the load must be on, or as near as possible to, the centre line of the vehicle in order to maintain lateral stability. (Tier 1)
5. Load anchors and load restraints must be certified. (Tier 2)

Equipment Condition

Critical Control CC02-02

Control Objective: Ensures vehicles are in good condition and safe to use.

1. Heavy trailers are clearly marked with loading certificate and fitted with certified (or manufacturers) anchor points. (Tier 1)
2. Light trailers have a current Warrant of Fitness, registration and not exceed towing vehicle rating capacity. (Tier 1)
3. Pre-use checks are completed on all vehicles and trailers. (Tier 1)
4. Recalls and industry specific alerts are actively managed for common defects or issues. (Tier 2)
5. Vehicles are in good condition and maintained in accordance with manufacturer / local requirements by competent mechanics. (Tier 2)
6. All heavy mobile equipment must have a certified operator protective structure installed that provides protection to the operator based on the task, working environment and risk (e.g. falling object, roll over, tip over, cabin operator). (Tier 2)
7. Light Vehicles must achieve a minimum Australasian New Car Assessment programme (ANCAP) or European NCAP rating of 4 at a minimum. (Tier 2)

Operator Competency

Critical Control CC02-03

Control Objective: Ensures operators are competent and capable of operating the equipment safely.

1. Operators have valid licences, endorsements, medicals and certificates required for the class and type of vehicle (e.g., light vehicles, heavy vehicles, forklifts, etc). (Tier 1)
2. Operators receive vehicle-specific competency assessments for heavy mobile equipment and special transport vehicles (e.g., concrete trucks, earth moving equipment). (Tier 2)

Route Planning / Environment

Critical Control CC02-04

Control Objective: Ensures the route of travel is chosen with consideration for safety.

1. Operators must have a plan for their journey (for one-way travel in excess of two hours) and logbooks (where required) to manage and monitor fatigue. (Tier 1)
2. All yards and surfaces must be level and free of defects if forklifts or other equipment are used to transport unrestrained loads. (Tier 1)
3. All haul roads and tip sites must have adequate bunding to protect drivers from exposed edges. (Tier 1)
4. All haul roads, loading areas and tip sites must be maintained and adequate to protect drivers from tip overs. (Tier 1)
5. Drains adjacent to haul roads must be designed at an angle leading away from the travelling direction, so that vehicles wheels cannot be trapped. (Tier 1)
6. Systems shall be in place to ensure that risks associated with vehicle journeys are managed and controlled including height checks and procedures for lone or remote workers. (Tier 2)

CR03 FAILURE OF LIFTING OPERATIONS

These controls are critical to prevent the Loss of Control of a load.

Exclusion Zones

Critical Control CC03-01

Control Objective: Prevent workers from being in the fall zone and exposed to dropped objects.

1. Exclusion zones must be put in place and managed to ensure no loads are lifted, suspended or placed over people. (Tier 1)
2. Physical barriers and / or other suitable controls are to be used, maintained and actively managed to exclude unauthorised persons from being around lifting devices, including protecting the outriggers from impact by passing traffic. (Tier 1)
3. Drop zones must be defined, identified, documented, communicated and managed for all lifting operations (e.g., lift plan, SOP, signage). (Tier 2)
4. Where exclusion zones are not practicable, an appropriate mitigation plan must be in place and approved by the General Manager (or delegate). (Tier 2)

Working Load Limits

Critical Control CC03-02

Control Objective: The lifting devices and equipment are capable of carrying the load safely for the material & conditions, per lift plan.

1. All lifts (excluding standard forklifts / combi-lifts lifting within their load limit) must have an approved lift plan or SOP as determined by the level of risk and complexity of the task using a relevant (Lift Category) Risk Assessment tool. (Tier 1)
2. Only approved and inspected lifting equipment and devices may be used for lifting operations. (Tier 1)

3. All lifting devices and equipment must be operated within the manufacturers safe working load or working load limit. (Tier 1)
4. Specialised lifting equipment (e.g., swift locks) can only be attached to certified lifting points on both the lifting device and (where applicable) the load. (Tier 1)
5. Fabricated or custom-built lifting equipment and support stands must be supplied with engineering calculations and drawings, checked and certified by a qualified engineer, which demonstrate it can support the rated safe working load limit. (Tier 2)
6. Where lifting devices are being operated in excess of 80% of their working load limit, test lifts must be conducted (unless fitted with interlocks) prior to the lifting operation commencing (including radius check and weight check for cranes). (Tier 2)
7. Load calibrations must be completed as per an established schedule (e.g, 6 monthly). (Tier 2)

Equipment Condition

Critical Control CC03-03

Control Objective: Cranes and lifting equipment are in good condition and safe for use.

1. Lifting devices must have a current Inspection Certificate available at all times. (Tier 1)
2. Lifting equipment (including booms) must be inspected in accordance with the ACOP for Load Lifting Rigging and AS4991 (Lifting Devices) and be inspected by a competent person daily or prior to any use. (Tier 1)
3. Crane commissioning, operation and decommissioning must be supervised by an authorised and competent person. (Tier 2)
4. Sites must implement and maintain an inspection regime to ensure all lifting devices and equipment have a unique identifier and remain current through stamps, tags or certifications (or approved local equivalent). (Tier 2)

Load Configuration and Stability

Critical Control CC03-04

Control Objective: Ensure load is secure and remains stable while being lifted, moved and placed.

1. Ground / weather conditions and presence of live utility services must be assessed, with appropriate controls implemented, to ensure stability and safe operation of the lifting device and load throughout the entire operation. (Tier 1)
2. Loads must be adequately secured (including covering where required) to ensure load remains stable and no items can come loose during all stages of the lifting operation. (Tier 1)
3. Placement of loads must be hands-free unless a risk assessment has been completed and additional controls (e.g., taglines and / or push-pull sticks) have been applied. (Tier 1)
4. Visual contact must be maintained between dogman and operator at all stages of the lift; if this is not possible, two-way closed circuit radio contact must be established and maintained. (Tier 1)

Competent Person

Critical Control CC03-05

Control Objective: Ensures persons directly involved in the planning and execution of lifts are trained and competent to perform the tasks.

1. Crane Operators and Dogman must be trained, authorised and verified as competent. (Tier 1)
2. All lifts must be managed and authorised by an approved and authorised person (e.g., crane controller or equivalent). (Tier 2)

CR04 ENTANGLEMENT, IMPACT OR CRUSHING

These controls are critical to prevent the Loss of Separation between a Person and a Machine.

Guards / Safety Devices / Barriers

Critical Control CC04-01

Control Objective: Prevents contact with blades, moving parts, heat and other equipment hazards and stored or uncontrolled energy sources.

1. Guards, isolations or barriers must be in place and fixed to ensure that workers cannot inadvertently or intentionally place any part of their body into the machine while it is operating, starting up or slowing down. (Tier 1)
2. All fixed plants must undergo a planned machine safety risk assessment by an ASNZ 4024 Machinery Safety specialist and all identified safety critical actions must be cleared before use. (Tier 3)
3. All critical guards, components (e.g., hoses, pressure relief valves) and safety devices (e.g., e-stops, interlock, locking pins) on fixed and mobile plant must be identified and managed via an approved maintenance system and have scheduled inspections and maintenance completed to ensure safe operation. (Tier 2)
4. All newly commissioned or designed (or redesigned) equipment must be assessed by a ASNZ 4024 Machinery Safety specialist (do not rely on the designer to have made it safe) and be made safe to category 3. (Tier 3)
5. All pressurised equipment (e.g., hydraulics, pneumatics, high pressure hoses) must be de-energised (e.g., forks lowered to ground) or restrained (e.g., anti-whiplash), and / or the operation isolated (e.g,. exclusion zone, barrier) to prevent inadvertent contact. (Tier 1)

Lock Out Tag Out (LOTO)

Critical Control CC04-02

Control Objective: Ensures the equipment is incapable of releasing energy / being reenergised / being contacted during work on or in close proximity to the source.

1. All energised equipment must be isolated as part of an approved LOTO safe work system that includes the 5 step process: Identify / Communicate hazardous energy sources; Shut down process; Isolation of energy sources; Lock out AND tag of all isolation points; verifying zero energy by testing reactivation. (Tier 1)
2. Individuals must be assigned personal locks – either through permanent assignment of locks or as a sign out system – which are clearly identified and labelled. (Tier 1)
3. All sites must have a documented isolation plan / register that covers off all potential energy sources or a current isolation (Process & Instrument) drawing. (Tier 2)
4. All equipment deemed unsafe to operate must be tagged with Out of Service Tags if they are not covered by LOTO. (Tier 1)
5. If Group LOTO (2 or more) or multiple isolation is required, a formal process (e.g., a Permit to Work) must be established. (Tier 2)

E-Stops

Critical Control CC04-03

Control Objective: Emergency-Stops moderate the impact if contact occurs.

1. E-Stops (either pull cords or buttons) must be within arms-reach of any accessible potential pinch points or contact locations. (Tier 1)
2. The frequency of testing (e.g., annual) of E-stops must be determined by a competent engineer as part of the overall machinery risk assessment and management system. (Tier 3)

Competency

Critical Control CC04-04

Control Objective: Ensures persons directly involved in the planning and execution of plant and equipment isolations are trained and competent to perform the tasks

1. All persons involved in the isolation of energy sources from plant and equipment, repairs and maintenance of plant and equipment must be trained in the isolation and Lockout Tagout process and be deemed competent to undertake the task. (Tier 2)

CR05 STRUCK BY MOBILE PLANT

These controls are critical to prevent the Loss of Separation between a Person and a Vehicle.

Exclusion Zones

Critical Control CC05-01

Control Objective: Exclusion zones / barriers prevent workers from coming into contact with operational mobile plant.

1. Exclusion Zones (e.g., hard barriers) must be in place, visually identified, sufficiently demarcated and actively monitored to achieve separation between people and plant. (Tier 1)
2. Where authorised persons must work in and around operational plant for safety or operational critical reasons, a process must be developed and controls implemented to provide separation between people and plant (e.g., halo, positive communication, proximity detection). (Tier 1)

Traffic Management Plan

Critical Control CC05-02

Control Objective: Ensure all vehicle movements are planned to ensure safe separation between operational plant and all persons on ground.

1. A site-based Traffic Management Plan must be in place to manage the segregation and movement of pedestrians, light vehicles and mobile equipment on site. (Tier 2)

Roll Away Protection

Critical Control CC05-03

Control Objective: Prevents uncontrolled movement when parked or unattended.

1. Where mobile plant and equipment is to be left unattended, it is to be left in a safe condition to prevent inadvertent movement (e.g. engine off, keys removed, braked, secured (where required) through the use of chocking, ditches, trenches or with wheels turned towards the wall). This is also to be applied to vehicles that are broken down or undergoing maintenance. (Tier 1)

CR06 OBJECTS FALLING FROM HEIGHTS

These controls are critical to prevent the Loss of Control of an object at Height.

Securing Tools & Equipment

Critical Control CC06-01

Control Objective: Restraint of tools, materials and / or equipment effectively, while conducting work at height or storing material at height.

1. Where work is carried out above others, tools, equipment and materials must be fixed and secure through the use of secondary containment (e.g. tethering, restraining, catch nets). (Tier 1)
2. Where objects could be blown from a height, they must be fixed and secured. (Tier 1)

Exclusion Zones

Critical Control CC06-02

Control Objective: Prevents workers from being in the fall zone and exposed to dropped objects.

1. Where working platforms, scaffolding, EWPs etc are in use, they must be effectively isolated and physically protected from being struck by passing machinery and plant. (Tier 1)
2. Where work is carried out at height and there is an ongoing risk of dropped objects, an exclusion zone must be established, visually identified, demarcated and managed in the area below the work. Consider work being undertaken in adjacent sites above you that may or may not be under your control. (Tier 1)

Stable Stacks and Good Racks

Critical Control CC06-03

Control Objective: Ensures storage systems are capable of taking the load of the material and is in good condition.

1. In frequently occupied areas, palletised goods must be restrained to prevent them from creeping and falling from the racking system. (Tier 1)
2. The height of shrink-wrapped pallets must not exceed three times their base, in order to reduce any toppling effect. The shrink wrapping must extend around the base of the pallet so that the goods and the pallet form one unit. (Tier 1)
3. Pallets shall be maintained in a good condition. Broken pallets shall be removed from service. (Tier 1)
4. Loose items over 5 kg (with a high centre of gravity) must not be stacked more than 1.2m (3.9ft) high without restraint (unless racking is designed for this purpose). (Tier 1)
5. Materials must only be stacked and stored if they conform to the dimensions of the racking system (as indicated on the end plate or load chart). (Tier 1)
6. Stacking of material must not be done within 450mm (17.7 inches) of a wall. (Tier 1)
7. A maintenance management system must be in place to ensure that shelving and racking systems are inspected on a schedule (quarterly or more frequent based on use or risk) and immediately following an incident where a racking system sustains impact. (Tier 2)

Fall Protection

Critical Control CC06-04

Control Objective: Prevents dropped items from falling and striking a person.

1. Toe boards on exposed edges must be in place anywhere workers may be underneath. (Tier 1)
2. Where persons must work or access an area below persons working at height overhead protection designed and approved by an Engineer needs to be installed (in addition to other controls such as edge protection) and maintained to protect persons below. (Tier 2)

Safety Critical Risks

CR07
CONTACT WITH ELECTRICITY

CR08
WORKING IN CONFINED SPACES

CR09
WORKING BESIDE LIVE TRAFFIC

CR10
CONTACT WITH UNDERGROUND SERVICES

CR11
TEMPORARY BUILDING OR STRUCTURE FAILURE

CR12
HOT WORK AND FIRE

CR13
COLLAPSE OF EXCAVATION OR STOCKPILE

CR14
EXPLOSIVES

CR15
WORKING NEAR OR OVER WATER

CR16
EXPOSURE TO SAFETY PROCESS RISKS

CR07 CONTACT WITH ENERGY

These controls are critical to prevent the Uncontrolled Release or Loss of Electricity

Isolation of Energy

Critical Control CC07-01

Control Objective: Prevent inadvertent contact with energy source.

1. All electrical energy circuits must be isolated as part of an approved LOTO safe work system that includes the 5 step process: Identify / Communicate hazardous energy sources; Shut down process; Isolation of energy sources; Lock out AND tag of all isolation points; verifying zero energy by testing reactivation. (Tier 1)
2. Portable electrical tools must be connected to a power supply via a suitable safety switch (RCD). The RCD must be fitted at the supply end of the cable and the test switch / button on the RCD must be tested daily when in use to verify the safe operation of the device. (Tier 1)
3. All switchboards must remain locked when they are in service. Access doors must only be opened by an electrical worker. (Tier 1)
4. Power poles and associated infrastructure (e.g. transformer boxes, stay wires) must be visually identified and physically protected / demarcated to prevent encroachment of Minimum Approach Distances (MAD) (e.g., 4 m) by plant and vehicles as specified by the asset owner. (Tier 1)
5. Where working within MAD, or where there is limited visibility in regard to overhead lines and structures, there must be a trained spotter (or standover for high voltage lines) in place at all times during the operation. (Tier 1)
6. Welding machines must have a voltage reduction device fitted when welding within steel structures. (Tier 1)

7. Electrical work to be completed as part of testing and commissioning, decommissioning and modification of plant or buildings must have a specialised risk assessment completed (including Arc flash) by a qualified electrician / engineer and systems put in place to manage the risk including specialist PPE. (Tier 2)

Identification of Services

Critical Control CC07-02

Control Objective: Reduce likelihood of contact with energy source.

1. Electrical leads and appliances that are connected to a power source via a flexible electrical lead must be tested and tagged in accordance with AS / NZS 3760. (Tier 1)
2. All electrical isolation points (including group isolations) must be clearly identified. (Tier 1)
3. A visual and physical means to identify / mark and alert persons of the location of overhead power lines must be installed on sites where overhead power lines are present. (Tier 1)

Utility / Network Owner Consent

Critical Control CC07-03

Control Objective: Ensures that the required controls are in place and that the hazards related to the activity are communicated.

1. The Asset Owner or Network Operator must be contacted to confirm the Minimum Approach Distance of any overhead and underground conductors and obtain close approach consent. (Tier 2)

Competency

Critical Control CC07-04

Control Objective: Ensures workers have the knowledge and experience to do the task safely.

1. Only licensed and registered electrical workers (and supervised electrical trainees) may work on, test or commission electrical installations. (Tier 1)
2. A process must be in place to ensure high voltage work and switching is only undertaken by authorised and certified high voltage operators to the standard of the asset owner's requirements. (Tier 2)
3. A process must be in place to ensure live work is limited to fault finding and commissioning activities and only be undertaken by a licenced and registered electrical worker (and supervised electrical trainees). (Tier 2)

CR08 WORKING IN CONFINED SPACE

These controls are critical to prevent exposure to an Environment that is Hostile to Life.

Safe Atmosphere

Critical Control CC08-01

Control Objective: The atmosphere inside the confined space is safe prior to and during entry.

1. Atmospheric testing must be undertaken by a trained and competent person, and recorded to prove the atmosphere inside the space is safe to enter. (Tier 1)
2. Where required, ventilation volume and flow must be sufficient for safe occupation. (Tier 1)
3. Confined space entrants must have continuous monitors on their person. (Tier 1)
4. Gas detectors are maintained and calibrated as per manufacturers specifications. Conduct bump test and baseline test outside of space to ensure they are working correctly. (Tier 1)

Identification / Security

Critical Control CC08-02

Control Objective: Prevents inadvertent access and exposure by untrained workers.

1. All confined spaces must be visually identified through Confined Space signage. (Tier 1)
2. Identified confined spaces must have a means to physically prevent unauthorised entry. (Tier 1)

Isolation / Containment

Critical Control CC08-03

Control Objective: Isolate or eliminate any energy sources or materials from igniting or entering the space during permitted entry.

1. All actual and potential energy sources and material entry points for the confined space must be isolated, tagged and proven isolated (or managed where isolation is not possible such as in stormwater / sewer systems). (Tier 1)
2. Only intrinsically safe electrical equipment may be used inside the space (based on a risk assessment). (Tier 1)
3. Materials or substances inside the space must be removed and / or isolated to prevent inundation during occupancy. (Tier 2)

Safety Observer

Critical Control CC08-04

Control Objective: Monitoring of entry team, confined space conditions and activation of emergency response.

1. Safety observer must not carry out any other duties while persons are inside the space; they must not leave their position. (Tier 1)
2. There must be an effective communication method between the entrants and the safety observer agreed; this must be implemented at all times during occupancy. (Tier 1)
3. Safety observer must carry out and document atmospheric tests at regular intervals (e.g., 30 minutes) while persons are inside the space. (Tier 2)

Permit to Work

Critical Control CC08-05

Control Objective: Ensures that the required controls are in place and that the hazards related to the activity are communicated.

1. All confined space entries must be controlled by a PTW which is issued, received including all required checks completed before entry is permitted. (Tier 1)
2. The Permit (and supporting documentation) must outline a safe system of work including clearly defined roles and responsibilities, hazards inside the space, materials and equipment to be used (including any limitations) any specific PPE requirements. (Tier 2)

Emergency Response

Critical Control CC08-06

Control Objective: Mitigates the severity of outcome from a confined space incident.

1. A specific rescue plan must be in place and all persons involved in the entry (and potential rescue) are briefed and understand contents of the plan. (Tier 1)
2. An emergency response (including rescue) trial must be conducted at least annually for a Confined Space entry and documented (include any external agencies as required). (Tier 2)

Competency

Critical Control CC08-07

Control Objective: Ensures persons involved in activity are aware of and understand risks and controls associated with confined space entry and are fit to work.

1. All persons involved in a confined space activity (entrants, safety observer and rescue team) must have completed accredited training in confined space entry and gas testing. (Tier 2)

CR09 WORKING BESIDE LIVE TRAFFIC

These controls are critical to prevent the Loss of Separation between a Person and a Vehicle.

Exclusion Zones

Critical Control CC09-01

Control Objective: Exclusion zones / barriers prevent workers from coming into contact with moving traffic or mobile plant.

1. Segregation controls ensure pedestrian movements are not permitted or isolated where there is mobile equipment or traffic (including rail) hazards in the area. (Tier 1)
2. Signage and markings are visible and clearly demarcate pedestrians and vehicles. (Tier 1)
3. Drivers must have equipment and training (e.g., emergency triangles) that enables them to alert other road users of a hazard and create a separation distance in the event of a breakdown or issue with a vehicle that needs to be corrected on the side of the road. (Tier 1)

Temporary Traffic Management

Critical Control CC09-02

Control Objective: Prevent workers from coming into contact with moving traffic or mobile plant.

1. Where people are working in the road corridor there must be a Road Controlling Authority (or equivalent) approved Traffic Management Plan (TMP) in place. (Tier 1)
2. The traffic management installed onsite must be compliant with the approved TMP and is managing the flow of traffic and separation of the site safely and effectively. Any changes made to the site by the STMS must be recorded on the TMP and be approved based on a risk assessment. (Tier 1)

3. Persons working in or adjacent to the Rail corridor must be authorised by the rail corridor access provider and work must be under the control of an authorised Rail Protection Officer. (Tier 1)
4. Documented inspections must take place to ensure the Traffic Management Equipment has been installed and maintained to ensure compliance with the TMP. (Tier 1)

Competency

Critical Control CC09-03

Control Objective: Ensures workers have the knowledge and experience to do the task safely.

1. Persons involved in installation, maintenance and deinstallation of TTM equipment must be clearly identifiable (e.g. STMS is wearing compliant vest) and be trained to the appropriate level of road in accordance with the relevant Industry Training & Competency Model. (Tier 1)
2. Persons conducting manual traffic control must be trained in accordance with the relevant Industry Training and Competency Model. (Tier 1)
3. Persons working the rail corridor must complete an induction and any required training with the controller or authority of the Rail Corridor. (Tier 1)

CR10 CONTACT WITH UNDERGROUND SERVICES

These controls are critical to prevent the Uncontrolled Release or Loss of Containment of Electricity, Gas or Other Utilities.

Isolation of Services

Critical Control CC10-01

Control Objective: Prevents inadvertent contact with energy sources and moderates the impact if contact occurs where energy sources cannot be positively confirmed.

1. Utility service plans for all known and indicated utility services within works area, and any as-builts for any recently completed works, must be obtained to ensure utility services can be identified. (Tier 1)
2. All known and indicated utility services must be identified and located using plans, mark outs and non-destructive pot holing (e.g. hydro-excavation, air-excavation or hand digging). (Tier 1)
3. There must be confirmation from the Utility Owner authorising temporarily isolating high risk utility services during specific activities; re-siting, repositioning or redesigning utility services. (Tier 2)

Permit to Work

Critical Control CC10-02

Control Objective: To ensure that the required controls are in place and that the hazards related to the activity are communicated.

1. A Utility Services Permit to Work must be issued by an authorised person is completed in full prior to ground being broken. (Tier 1)

CR11 TEMPORARY BUILDING OR STRUCTURE FAILURE

These controls are critical to prevent Structural Failure or Collapse of Temporary Works.

Structural Integrity

Critical Control CC11-01

Control Objective: To ensure that the building or structure does not collapse / become unstable.

1. A Designated Individual (DI) must be appointed to establish, implement and maintain a procedure for the control of temporary works. (Tier 2)
2. Temporary Works Management Plans (TWMP) must be developed, implemented, and approved by the Designated Individual. (Tier 2)

Installation and Maintenance

Critical Control CC11-02

Control Objective: To ensure that the construction / installation is of sufficient quality as to eliminate the chance of failure.

1. All temporary works must be installed, maintained, and monitored in accordance with design requirements. (Tier 2)
2. All temporary works must be inspected prior to use, when working adjacent to. (Tier 1)
3. All temporary works must be inspected prior to and following any extreme weather event or natural disaster. (Tier 1)

Demolition / Deconstruction / Modification

Critical Control CC11-03

Control Objective: To reduce the impact of any actions during works to the structural integrity of the building / structure.

1. All temporary works must be deconstructed in accordance with design requirements. (Tier 2)
2. Modifications to Temporary Works must be in accordance with Temporary Works Management Plans (TWMP) and approved by the Designer and the Checker. (Tier 3)
3. Exclusion zones or overhead protection must be in place for demolition works or any other controlled method of structural deconstruction where there is a risk of structural collapse beyond the applicable area. (Tier 1)

CR12 HOT WORK AND FIRE

These controls are critical to prevent the Uncontrolled release of loss of heat.

Isolation of Hot Work

Critical Control CC12-01

Control Objective: Ensures the equipment / utility is incapable of releasing energy / being reenergised / being contacted during work on or in close proximity to the source.

1. Isolation and de-isolation of energy sources (that could lead to ignition within the hot work area) must be completed by a competent and authorised person. (Tier 1)
2. All hydrocarbon fuel sources and other flammable fuel sources must be isolated (either physically or through distance) from ignition sources. (Tier 1)
3. Hot work must take place in a designated hot work area or an area where a Hot Work Permit has been issued. (Tier 1)
4. Adequate ventilation must be present in the hot work area to prevent a build-up of fumes. This must be mechanical where the risk of fume build up is high. (Tier 1)

Removal of Combustibles

Critical Control CC12-02

Control Objective: Prevent possible ignition of combustible materials.

1. All potential combustibles must be removed to a distance of 10 m in NZ and 15 m in Australia, wet down or covered (including floor openings, cavities and cracks) for the duration of the hot work activity to prevent possible ignition including a pre work risk assessment of potential fire load in work area and adjacent areas. (Tier 1)

Fire Watch

Critical Control CC12-03

Control Objective: Ensures monitoring of hot work activity and site post activity and activation of emergency response.

1. Where a fire watch is stipulated on the PTW, a fire watch must be appointed to monitor the area for a continuous 60 minutes (or as determined by a risk assessment) at the end of the activity and verification of the checks being completed must be sought and checked. (Tier 1)
2. Adequate (and sufficient number of) fire-fighting equipment must be available for the duration of the hot work activity and fire watch activities and monitoring period that is appropriate and compatible for the task, site and type of combustibles. (Tier 1)
3. An agreed (documented) communication method must be in place between the person(s) doing the hot work and the fire watch. (Tier 1)

Permit to Work

Critical Control CC12-04

Control Objective: To ensure that the required controls are in place and that the hazards related to the activity are communicated.

1. A Hot Work Permit to Work must be issued and received by authorised person(s) and be in place on site to manage the hot work activity (outside of any designated hot work area) and the required checks are to be completed in full prior to hot work activity commencing. (Tier 1)
2. Atmospheric monitoring (where required e.g. hazardous zones) must be completed and recorded prior to hot work starting and checked and recorded at regular intervals (e.g., 30 minutes) on the Hot Work Permit to Work. (Tier 1)
3. A site or task visual inspection must be completed prior to issuing and before closing the work permit. (Tier 1)

Health Monitoring

Critical Control CC12-05

Control Objective: Ensures monitoring of levels of harmful substances and impact on individuals.

1. Where there is evidence or concern that fume exposures could be harmful, exposure monitoring must be carried out by an occupational hygienist or other suitably qualified person. (Tier 2)
2. All workers regularly exposed to hazardous fumes must receive annual health checks that include lung function. (Tier 2)

CR13 COLLAPSE OF EXCAVATION OR STOCKPILE

These controls are critical to prevent the Ground becoming Unstable and the Failure of Earthworks or Stockpiles.

Stable Excavation

Critical Control CC13-01

Control Objective: Prevents the soil / material from collapsing in on workers.

1. Engineering Controls must be installed and maintained to prevent and manage the accumulation of ground water, fumes and gases in all excavations and trenches to prevent engulfment where it is a risk. (Tier 1)
2. Excavations and trenches must be inspected by a competent person before each working shift and after rainfall, or other events, which could impact ground stability or introduce further hazards and result in engulfment. The inspection must be documented. (Tier 1)
3. All excavations in unstable ground or greater than 1.5m deep, must be undertaken in accordance with design requirements and include controls such as boxing, benching, dewatering, shoring, or battering. (Tier 1)
4. All excavations in unstable ground or greater than 1.5m deep, must be correctly benched, shored using an approved system, or correctly battered to a safe angle of repose or as determined by a competent person before any person can enter the trench / excavation. (Tier 2)
5. All operational plant associated with excavation activity must be operated and positioned in a manner that does not to create an overloading on the excavation stability. (Tier 1)
6. Materials, spoil and equipment must be placed in a location at least 1 m from the edge of the excavation in order to mitigate the risk of inundation or collapse. (Tier 1)

Edge Protection

Critical Control CC13-02

Control Objective: Prevents persons from falling or dropping items over an edge into the excavation.

1. Adequate protection must be provided, installed, and maintained at all times along the edges of excavations / trenches. This may include edge protection; fencing to prevent unauthorised access; and sufficient signage to warn all parties of the risks. (Tier 1)
2. A safe means of access and egress must be established and maintained for all excavations and trenches where individuals may be required to enter. (Tier 1)

CR14 EXPLOSIVES

These controls are critical to prevent the Uncontrolled Release of Explosives.

Management Plan

Critical Control CC14-01

Control Objective: Ensures all blasts are planned to ensure safe execution and separation between the blast area and persons.

1. An Explosives and Shot firing Management Plan must be approved by a competent person. The plan must include explosive quality control, competency requirements, contractor qualifications (including misfire history) and management of misfiring – Type A and B. (Tier 2)

Site Security

Critical Control CC14-02

Control Objective: Prevent unauthorised access to, or use of, explosives and detonators.

1. A Site Security Plan must be in place to prevent unauthorised access to, or use of, explosives and detonators that are transported to and stored on site (including sleeper shots). (Tier 1)

Storage

Critical Control CC14-03

Control Objective: Prevents unauthorised access to, and prevents reaction between incompatible materials and mitigates impact of any loss of containment.

1. Explosives and detonators must be stored in a safe and secure location, and in a licensed or approved magazine, with separate storage for explosives and detonators. (Tier 1)

Exclusion Zones

Critical Control CC14-04

Control Objective: Prevents workers from being in the blast zone and exposed to blasting debris.

1. Exclusion zones and procedures must be in place for pre-blast inspection, clearance, and sentry placement, for the safety of personnel, plant, and equipment during blasting. (Tier 1)

CR15 WORKING NEAR OR OVER WATER

These controls are critical to prevent the Exposure to Drowning.

Equipment / Structure Integrity

Critical Control CC15-01

Control Objective: To ensure that the boats, structures, and plant used on or near water are structurally sound and not at risk of collapse or failure.

1. Where there are temporary structures, a temporary works design and / or certifications must be in place to ensure barriers, scaffolding, screens, penetration covers, anchor points and working platforms (for people and plant) used are designed, safe and fit for purpose. These must be recorded on the TW register. (Tier 2)
2. Surfaces or work areas over water that need to be accessed or trafficked, must be assessed to ensure they are safe prior to access being allowed. (Tier 2)
3. All scaffolding, penetration covers, anchor points and working platforms in use over water must be inspected regularly (e.g., weekly) to ensure they are safe and fit for purpose. These inspections must be documented. (Tier 2)
4. All marine vessels, boats and barges must be fit for purpose, mobilised, operated and maintained in accordance with manufacturers specification, and where required, certified in accordance with Maritime Regulations (e.g. fit for purpose certificate, load line certificate and barge safety certificate). (Tier 2)
5. Operational plant associated with excavation activities near waterways must be operated and positioned in a manner that does not undermine or create an overloading on the working platform stability. (Tier 1)

Edge Protection

Critical Control CC15-02

Control Objective: Prevent individuals from falling into waterways.

1. All fall edges must be protected by a physical barrier of sufficient height (e.g., 1100 mm) and strength that prevents persons falling into water (as required based on a risk assessment). (Tier 1)

Emergency Response

Critical Control CC15-03

Control Objective: To mitigate the severity of a water-based incident.

1. There must be sufficient water safety and emergency equipment available and maintained / inspected for the task, the number of workers and the environment in which it is operating. (Tier 1)
2. Personal Flotation Devices must be worn by all individuals where there is an immediate risk of a fall into the water. (Tier 1)
3. Emergency Response Plans and potential rescues must be regularly tested (e.g., annual) related to incidents and potential scenarios with working in, on or around water. (Tier 2)

Competency

Critical Control CC15-04

Control Objective: Ensures vessel operators workers have the knowledge and experience to navigate and operate safely.

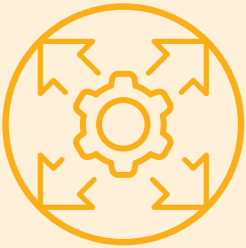
1. Boat and marine plant operators must be certified, licensed or deemed competent for vessel and marine plant operation (e.g. boatswain's or coxswain's qualifications). (Tier 1)

Dive Plan

Critical Control CC15-05

Control Objective: Ensure all dives are planned to ensure safe execution and separation between the dive area and operations and adjacent activities.

1. A Dive Plan must be developed, implemented, maintained and approved by a competent person. (Tier 2)



CR16 EXPOSURE TO SAFETY PROCESS RISKS

These controls are critical to prevent Loss of Containment or an uncontrolled event.

Ownership and Capability

Critical Control CC16-01

Control Objective: To ensure that the risks associated with process safety are understood, managed, and monitored effectively by designated individuals.

1. An operational leader must be identified and assigned responsibility for process safety risk management; this person must have an understanding and ownership of process safety risk on sites, assets and / or projects. (Tier 2)
2. A process safety engineer (internal or external) must be identified who provides ongoing expert guidance and support for operational process safety risks. (Tier 1)
3. Training and competency checks must be completed for all workers (including contractors) who may work with, around or on process safety systems or structures. (Tier 2)

Process Hazard Analysis

Critical Control CC16-02

Control Objective: To ensure that the process hazards are identified, analysed and that controls are identified to manage risk to acceptable levels.

1. A preliminary hazard analysis and supporting risk assessments (HAZOP, HAZID, Bowties, etc) must be completed as determined appropriate for the process. (Tier 2)
2. Process safety critical elements must be identified as part of the risk assessment process. (Tier 1)
3. Safety critical elements (e.g., SOPs, maintenance, inspections, etc) must be implemented and monitored. (Tier 2)

4. Pre-start safety reviews must be completed following maintenance shuts or commissioning and include a risk assessment of all related safety critical elements. (Tier 1)
5. There must be a process in place to review any change to documented processes, technology, structures, or assets that are associated with safety critical elements (e.g., management of change processes). (Tier 2)

Audit and Planning

Critical Control CC16-03

Control Objective: To ensure that plans are in place and regularly assessed to ensure that Critical Safety Elements are implemented and maintained, and the impacts of an event can be mitigated if it were to occur.

1. A Process Safety Management Plan must be developed and implemented which includes management of the key elements of process safety. (Tier 2)
2. Appropriate Emergency Plans must be implemented and routinely tested for potential catastrophic failure events identified in the hazard identification process. (Tier 2)
3. Internal audits must be completed annually by a competent person to review the application of the Process Safety Management Plan and Critical Safety Elements. (Tier 2)
4. An external audit must be completed every two years covers application of the Process Safety Management Plan and Critical Safety Elements. (Tier 3)

Monitoring and Reporting

Critical Control CC16-04

Control Objective: To ensure that performance requirements have been set that are appropriate for the process safety risks and that these are regularly monitored by the appropriate risk owners.

1. An assigned senior leadership committee or group (consisting of technical experts, management, and operations) must regularly review the management and performance of process safety on their sites. (Tier 2)
2. Metrics and performance targets must be set which are appropriate for safety critical elements. (Tier 2)
3. Incident Investigations must be completed for any failures (or potential failures) of safety critical elements and actions taken across all sites with similar processes. (Tier 1)

Health Critical Risks

CR17
EXPOSURE TO HAZARDOUS SUBSTANCES

CR18
EXPOSURE TO DUSTS AND SILICA

CR19
EXPOSURE TO ASBESTOS

CR20
EXPOSURE TO NOISE

CR17 EXPOSURE TO HAZARDOUS SUBSTANCES

These controls are critical to prevent the Loss of Secondary Containment.

Containment Design

Critical Control CC17-01

Control Objective: Prevent inadvertent contact, ignition, spontaneous combustion, or explosion and prevents loss of containment during storage, use or disposal.

1. All specifications for the design and / or modification of hazardous materials facilities must be completed in accordance with a risk assessment that includes hazardous materials selection, transport, production, storage, handling, use and disposal. (Tier 2)
2. Vessels and containers storing hazardous substances must have secondary containment (bunds) that can contain 110% the maximum capacity of the largest tank or drum being stored. (Tier 1)

Access Control

Critical Control CC17-02

Control Objective: To prevent inadvertent access and exposure by untrained workers.

1. Hazardous substances must be secure, and access restricted to authorised and trained personnel only with appropriate personal protective equipment as per Safety Data Sheet requirements. (Tier 1)

Storage and Labelling

Critical Control CC17-03

Control Objective: To ensure hazardous substances are stored safely and clearly labelled to avoid unsafe use.

1. All substances must be stored and labelled in accordance with Safety Data Sheet (and other relevant requirements). (Tier 1)
2. All hazardous substances must have a readily accessible, current (<5 years old) Safety Data Sheet supplied from the supplier / vendor or approved system such as Chemwatch. (Tier 1)
3. All substances must be included on a site register or inventory which includes the type and quantity stored. (Tier 1)
4. All hazardous substances being transported must be secure, be correctly labelled (placard) and have readily available for inspection the appropriate documentation (quantities, safety data sheet, emergency response plan). (Tier 1)
5. Any substances that are decanted into a secondary container for storage must be labelled with the contents and key safety precautions. (Tier 1)

Testing and Monitoring

Critical Control CC17-04

Control Objective: Monitors actual levels of exposure and biological impact on workers.

1. Sites must have a health surveillance programme for workers at risk of exposure to hazardous substances above 50% of established exposure standards. (Tier 2)
2. Sites must maintain a workplace exposure monitoring programme to determine and monitor ongoing potential exposure levels for hazardous substances. (Tier 2)
3. The results of the health surveillance and workplace exposure monitoring must be compared to confirm that the controls are being maintained and effective. (Tier 2)

Emergency Response

Critical Control CC17-05

Control Objective: Mitigate the severity of outcome from a Hazardous Substances incident.

1. All facilities which have a major or catastrophic risk from hazardous substances must maintain and routinely test an emergency response plan which is appropriate for the substances on site. This plan and the associated inventory must be provided to and readily available for first responders. (Tier 2)

Competency

Critical Control CC17-06

Control Objective: Ensures workers have the knowledge and experience to work with the hazardous substances safely.

1. Persons involved in the handling, use, transport, storage and disposal of hazardous substances must be trained in relevant work procedures and safety data sheet requirements. (Tier 2)
2. A suitably qualified individual must be assigned responsibility for monitoring, escalating and communicating health and exposure monitoring results to affected parties and managers. (Tier 2)

CR18 EXPOSURE TO DUSTS AND SILICA

These controls are critical to prevent the Loss of Containment.

Suppression

Critical Control CC18-01

Control Objective: To minimise the amount of dust and Respirable Crystalline Silica (RCS) that becomes airborne.

1. Where silica dust is produced, local exhaust ventilation, extraction, containment, water suppression, or dust collection systems must be installed, used, and maintained. (Tier 1)
2. Wet grinding or cutting methods must be applied on site to suppress or contain dust when cutting, grinding or drilling into concrete / stone-based products. (Tier 1)
3. Clean up of residual materials and dust must be completed using wet cloths, a low pressure water hose or vacuum system. (Tier 1)

Testing and Monitoring

Critical Control CC18-02

Control Objective: Monitors actual levels of exposure and biological impact on workers.

1. Where dust exposures are assessed to be a risk, a Dust Exposure Management Plan must be developed and maintained based on baseline exposure levels and guidance from a Registered Occupational Hygienist or other suitably qualified person. (Tier 2)
2. Where dust exposures reach 50% of exposure levels, exposure monitoring (e.g., annual) must be carried out by an occupational hygienist or other suitably qualified person as per the exposure management plan. (Tier 2)

3. All workers regularly exposed to 50% of exposure levels must receive spirometry testing and an annual health check. (Tier 2)
4. The results of the health surveillance and workplace exposure monitoring must be compared to confirm that the controls are being maintained and effective. (Tier 2)
5. Mechanical dust extraction systems (e.g., local exhaust ventilation systems) must be maintained as per manufacturers specifications and undergo performance checks (e.g., annual) to ensure that the air exchange system continues to meet dust extraction requirements. (Tier 2)

Product Stewardship

Critical Control CC18-03

Control Objective: Ensure communication of hazards, potential harm and required controls associated with RCS containing products.

1. Manufacturers or distributors of silica containing products must ensure silica containing products are clearly labelled and inform the consumer of the risks and required controls. (Tier 2)

Exclusion Zones

Critical Control CC18-04

Control Objective: Prevent people accessing areas of potential high dust and RCS concentration.

1. Exclusion zones must be established to protect others from dust and silica exposure and these must consider the wind direction. (Tier 1)

Respiratory Protection

Critical Control CC18-05

Control Objective: Mitigate the severity of the exposure to RCS and dust.

1. At a minimum a P2 respirator must be used. Where routine activities include exposure to silica, half-face, supplied air or full-face respirators must be considered. (Tier 1)
2. Fit testing and training must be completed for all workers that are required to use a respirator. (Tier 2)

Competency

Critical Control CC18-06

Control Objective: Ensures workers have the knowledge and experience to do the tasks safely.

1. Workers who are regularly exposed to RCS must be trained in: the health risks from their exposure; how to use the identified controls including Local Exhaust Ventilation (LEV) use and maintenance; appropriate use and care of Personal Protective Equipment, including clothing and respiratory protection. (Tier 2)
2. A suitably qualified individual must be assigned responsibility for monitoring, escalating and communicating health and exposure monitoring results to affected parties and managers. (Tier 2)

CR19 EXPOSURE TO ASBESTOS

These controls are critical to prevent the Loss of Containment.

Register and Plan

Critical Control CC19-01

Control Objective: To have knowledge of locations and types of asbestos to ensure that it can be effectively managed.

1. Each premise which has identified the presence of asbestos or asbestos containing material (ACM)must have an Asbestos Survey, Asbestos Register and a written Asbestos Management Plan. (Tier 2)

Monitoring

Critical Control CC19-02

Control Objective: To ensure that asbestos fibres aren't being released and that they are not harming the workers.

1. Where there is evidence or concern that ACM may be exposed, an exposure assessment must be carried out by a Registered Occupational Hygienist or other suitably qualified person. (Tier 3)
2. Where workers are involved in ongoing (greater than 4 weeks in any 12-month period) asbestos-related work, exposure monitoring must be completed by a specialist for the duration of the work activities (e.g., swab testing, dust monitoring, etc). (Tier 2)
3. All workers exposed to asbestos must participate in a medical surveillance monitoring programme. Health assessments must be performed every two years from when the work with or exposure to asbestos commenced. (Tier 2)

Competency

Critical Control CC19-03

Control Objective: To ensure that the operators have the skills and knowledge to operate with asbestos in a safe manner.

1. Persons directly involved in the removal and handling of ACM must be Certified. (Tier 1)
2. Workers who are regularly exposed to ACM must be trained in the health risks from their exposure and the controls required. (Tier 2)
3. A suitably qualified individual must be assigned responsibility for monitoring, escalating and communicating health and exposure monitoring results to affected parties and managers. (Tier 2)

Decontamination

Critical Control CC19-04

Control Objective: To mitigate the spread of fibres across the worksite / other locations.

1. An Asbestos removal Control Plan (ARCP)(including facilities, processes, and disposal requirements for decontamination) must be in place prior to any ACM work commencing. (Tier 2)

CR20 EXPOSURE TO NOISE

These controls are Critical to Prevent Exposure to short term high frequency or long-term noise.

Noise Suppression

Critical Control CC20-01

Control Objective: To impede the paths of transmission of noise.

1. Noisy environments (i.e., above 85 dB(A) for 8 hours) must be assessed by a Registered Occupational Hygienist or other competent person, and appropriate controls be implemented (e.g., noise suppression, substitution of equipment, installation of noise barriers / absorbers, PPE etc). (Tier 2)

Hearing Protection

Critical Control CC20-02

Control Objective: To reduce the amount of noise that reaches the human ear.

1. Hearing protection (rated for the noise levels) must be worn by all workers, visitors and contractors in areas or during activities that are identified as a risk. (Tier 1)

Monitoring

Critical Control CC20-03

Control Objective: To ensure that controls are effective.

1. Sites must have a health surveillance programme for workers at risk of exposure to noise (and records maintained for 30 years). (Tier 2)
2. Where sites, areas or tasks are identified as at risk for hazardous noise, these areas must be regularly (e.g., annually) monitored for noise levels as per the defined noise monitoring programme. (Tier 2)

3. The results of the health surveillance and workplace exposure monitoring must be compared to confirm that the controls are being maintained and effective. (Tier 2)

Competency

Critical Control CC20-04

Control Objective: To ensure that all employees understand the correct use of hearing protection.

1. All workers must be trained on the correct choice, use and maintenance of the applicable hearing protection. (Tier 2)
2. A suitably qualified individual must be assigned responsibility for monitoring, escalating and communicating health and exposure monitoring results to affected parties and managers. (Tier 2)

Environmental Critical Risks

CR21
DISCHARGE TO LAND, AIR OR WATER

CR21 DISCHARGE TO LAND, AIR OR WATER

These controls are critical to prevent Loss of Containment.

Sediment or Erosion Control

Critical Control CC21-01

Control Objective: Ensures all stockpiles, materials and exposed areas are managed to prevent erosion and contain sediment / material runoff within the site.

1. Erosion and Sediment Control devices must have a design and be as built to confirm they have been constructed in accordance with the relevant guidelines. (Tier 2)
2. Chemical treatment devices must be installed as per manufacturers specifications and maintained. (Tier2)
3. Exposed areas of soil or stockpiles must be minimised (e.g. staged topsoil strip and grassed or covered) and completed areas stabilised to prevent unexpected runoff or dust. (Tier 1)
4. Silt fences, de-watering or ponds must be constructed, inspected and maintained to ensure all runoff is contained or treated on the site. (Tier 1)
5. Stormwater catch pit protection (e.g., stormwater socks) must be installed prior to operations commencing and maintained. (Tier 1)
6. Sediment pond or treatment device outlets must be monitored against discharge criteria (e.g., pH, turbidity, etc). (Tier 2)
7. Clean water diversions must be inspected and maintained. (Tier 1)

Bunding / Containment

Critical Control CC21-02

Control Objective: Ensures all liquids hazardous to the environment are securely covered and contained to prevent runoff within the site.

1. Facilities used to store hazardous substances must maintain an inventory of the type and quantity being stored. (Tier 1)
2. Any locations which exceed quantity thresholds must hold and maintain appropriate certifications (e.g., Location Certificates, DG, etc). (Tier 1)
3. All hazardous substances must have an up to date (<5 years old) Safety data Sheet supplied from the supplier or vendor. (Tier 1)
4. All substances stored in vessels or containers must be correctly labelled. (Tier 1)
5. Vessels and containers storing hazardous substances must have secondary containment that can contain 110% of the net capacity of the largest stationary container and all permanent bunds marked with maximum volumes. (Tier 1)
6. A spill response plan must be readily available (within 10 minutes) and appropriate to substances used, stored, handled or transported. (Tier 1)
7. Spill kits must be stocked with sufficient materials appropriate to the size of the activity and the substances used and located at refuelling areas, substance transfer and storage areas. (Tier 1)

Contaminated Materials

Critical Control CC21-03

Control Objective: Ensures any contaminated or environmentally hazardous or nuisance materials created by our operations are contained, and where required, safely and legally removed from site and disposed of.

1. Runoff from contaminated areas must be contained, managed, and isolated from overland flow paths. (Tier 1)
2. All contaminated materials must be identified, contained, treated (if required) and disposed of in accordance with a management plan by competent persons. (Tier 2)
3. Discharges of hazardous substances or chemicals to stormwater and sewer must be prevented and managed (e.g. cleaning of paint brushes, plaster, concrete etc.). (Tier 1)

4. Wash areas for contaminated materials or products (e.g. concrete slurry) must be designated, bunded or contained and maintained. (Tier 1)
5. Handling and storage of ecotoxic class 9 substances must not occur within 30 meters of a defined waterway without an approved management plan. (Tier 1)
6. All dewatering activities must be managed by a Permit (e.g., Permit to Pump) and a record of monitoring maintained on the permit. (Tier 1)

Nuisance / Disturbance

Critical Control CC21-04

Control Objective: Ensures all operational activities (including night works) do not cause unnecessary disturbance, nuisance and hazards (from light, noise, vibration, dust & dirt) to adjacent site neighbours and road users.

1. Scheduled monitoring must be in place on boundaries where objectionable odours, dust, noise, light, vibrations have been identified as a community risk. (Tier 2)
2. Dust must be suppressed within the site boundaries (e.g. water cart and drivers). (Tier 1)
3. A system must be in place to ensure dirt / debris from site operations is not tracked onto the road (e.g. wheel wash, rumble strips, clean metal, inspections). (Tier 1)

Extreme Weather Events

Critical Control CC21-05

Control Objective: Ensures that the required controls are in place in the event of an extreme rain, wind or other event.

1. Emergency plans must be in place for extreme rain, wind or other events which may exceed drainage capacity or create a new environmental risk (e.g., dust) including checking of controls before and after the event. (Tier 1)

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