SafeWork NSW

NSW GOVERNMENT

Moving plant on construction sites

Code of practice

December 2025

Editorial note

This Code of practice has been developed by SafeWork NSW and has been approved under section 274 of the NSW *Work Health and Safety Act 2011*. Notice of that approval was published in the NSW Government Gazette referring to this Code of practice as Moving plant on construction sites Friday 12 December 2025. This Code of practice commenced on 12 December 2025. It replaces the 2004 Moving plant on construction sites Code of practice.

This Code of practice (this Code) should be read in its entirety.

When reading this Code, please be aware that any reference to:

- the 'Work Health and Safety Act' refers to the *Work Health and Safety Act 2011* (NSW), or any successor legislation,
- the 'Work Health and Safety Regulation' refers to the *Work Health and Safety Regulation 2025* (NSW), or any successor regulation,
- a code of practice refers to the relevant NSW Code of practice, or any successor code of practice.

This Code may contain references to relevant withdrawn or superseded Australian Standards or Australian/New Zealand Standards.

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Acknowledgment

SafeWork NSW wishes to acknowledge the contribution and collaboration of industry and social partners through the public comment period and technical development of this Code.

Additionally, the cooperation of other WHS regulators and Safe Work Australia is acknowledged for aligning materials where appropriate, particularly from Safe Work Australia's Guidance Material and WorkSafe New Zealand's illustrations.

Contents

Foreword

This Code of practice (this Code) on how to manage work health and safety risks associated with moving plant on construction sites is an approved code of practice under section 274 of the *Work Health and Safety Act 2011* (the WHS Act).

An approved code of practice provides practical guidance on how to achieve the standards of work health and safety required under the WHS Act and the *Work Health and Safety Regulation* (the WHS Regulation) and effective ways to identify and manage risks.

A code of practice can assist anyone who has a duty of care in the circumstances described in the code of practice. Following an approved code of practice will assist the duty holder to achieve compliance with the health and safety duties in the WHS Act and WHS Regulation, in relation to the subject matter of the code of practice. Like regulations, codes of practice deal with particular issues and may not cover all relevant hazards or risks. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and WHS Regulation. Courts may regard a code of practice as evidence of what is known about a hazard, risk, risk assessment or risk control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code of practice relates. For further information see Safe Work Australia's *Interpretive Guideline: The meaning of 'reasonably practicable'*.

Compliance with the WHS Act and WHS Regulation may be achieved by following another method if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

Scope and application

This Code is intended to be read by a person conducting a business or undertaking (PCBU). It provides practical guidance to PCBUs on how to manage risks to health and safety associated with moving plant on construction sites. Other approved codes of practice should be referenced for guidance on managing the risk of specific hazards, including the *Code of practice: Construction work*.

This Code may be a useful reference for other persons interested in the duties under the WHS Act and WHS Regulation.

For the purpose of this Code, the term "moving plant" will be used to describe powered moving plant used on construction sites.

This Code applies to all types of work and all workplaces covered by the WHS Act where moving plant is used on construction sites.

How to use this Code of practice

This Code includes various references to the legal requirements under the WHS Act and WHS Regulation. These references are included for convenience only and should not be relied on in place of the full text of the WHS Act or WHS Regulation. The words 'must', 'requires' or 'mandatory' indicate a legal requirement exists that must be complied with.

The word 'should' is used in this Code to indicate a recommended course of action, while 'may' is used to indicate an optional course of action.

1. Introduction

1.1 What is moving plant and what is a construction site?

Moving plant is a major cause of serious injuries and fatalities on construction sites.

Moving plant

Moving plant refers to plant that moves either under its own power (powered mobile plant) or is pulled or pushed by other powered mobile plant. This includes:

- plant that moves on or around the construction site and enters or leaves the site,
- road vehicles when entering, within, and exiting the construction site,
- vehicles that load and unload within the primary site or at adjacent site(s).

Moving plant can be directly controlled from the moving plant itself, via a pendant, or remote controlled on-site or off-site.

Common types of moving plant on construction sites include trucks, light vehicles, load shifting / earthmoving equipment, scissor and boom lifts, material handling equipment, piling rigs, concrete placing equipment, access equipment, and mobile cranes.

Construction site

The term “construction site” refers to an area where construction work is taking place. This encompasses various locations undergoing construction work.

For further information refer to the *Code of practice: Construction Work*.

1.2 Who has health and safety duties?

There are a number of duty holders who have a role in managing the risks of moving plant on construction sites, including those listed below.

A person can have more than one duty and more than one person can have the same duty at the same time.

The main duty holders and key legislative provisions have been referenced in the table below, however the list is not exhaustive.

Duty holder	Application
Person conducting a business or undertaking (PCBU) WHS Act sections 19, 46 and 47 WHS Regulation section 55C	A PCBU must eliminate risks to health and safety arising from moving plant on construction sites, or if that is not reasonably practicable, minimise the risks so far as is reasonably practicable. This includes: • the provision and maintenance of a work environment without risks to health and safety, • the provision and maintenance of safe plant and structures, • the provision and maintenance of safe systems of work, • the safe use, handling, and storage of plant, structures and substances, • the provision of information, training, instruction and supervision necessary to protect people from risks to health and safety, • the provision of adequate facilities for the welfare at work of workers, • monitoring the health and conditions of the workplace to prevent illness and injury, • managing psychosocial hazards. PCBUs also have duties to: • consult workers about work health and safety, • consult, cooperate and coordinate with other duty holders, • ensure that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking.
PCBU with management or control of a workplace WHS Act section 20	Must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace and anything arising from the workplace are without risks to the health and safety of any person.

Duty holder	Application
Designers, manufacturers, importers, installers and suppliers of plant, substances or structures WHS Act sections 22-26	Must ensure, so far as is reasonably practicable, the plant / substances / structures they design, manufacture, import, supply or install are, so far as is reasonably practicable, without risks to health and safety including carrying out testing and analysis and providing adequate information about the risks posed to users of the plant, substances or structures.
Persons with management or control of fixtures, fittings and plant at a workplace WHS Act section 21 WHS Regulation section 203	Must ensure, so far as is reasonably practicable, that the fixtures, fittings and plant are without risks to the health and safety of any person. A person with management or control of plant at a workplace must manage risks to health and safety associated with plant, in accordance with Part 3.1 of the WHS Regulation.
Officers WHS Act section 27	Officers of the PCBU must exercise due diligence to ensure the PCBU complies with the WHS Act and WHS Regulation. This includes maintaining up to date WHS knowledge and taking reasonable steps to ensure the business or undertaking has and uses appropriate resources and processes to eliminate or minimise risks to health and safety from moving plant on construction sites. Further information on who is an officer and their duties is available in Safe Work Australia's *Interpretive Guideline: The health and safety duty of an officer*.
Workers WHS Act section 28 WHS Regulation section 46	While at work, workers must: • take reasonable care for their own health and safety, • take reasonable care that their actions or omissions do not adversely affect the health and safety of other persons, • comply with any reasonable instructions given by the PCBU, as far as they are reasonably able, • cooperate with any reasonable health and safety policies or procedures of the PCBU. If personal protective equipment (PPE) is provided by the PCBU, the worker must, so far as they are reasonably able, use or wear it in accordance with the information, instruction and training provided.

Duty holder	Application
Other persons at the workplace WHS Act section 29	A person at a workplace must: • take reasonable care for their own health and safety, • take reasonable care that their acts or omissions do not adversely affect other people's health and safety, • comply, so far as they are reasonably able, with reasonable instructions given by the PCBU to allow the PCBU to comply with the WHS Act.
Principal contractors on construction projects WHS Act section 20 WHS Regulation sections 293, 299, 301 and 307-315	Principal contractors are a PCBU who commissions a construction project or is engaged to be a principal contractor by the person who commissioned the project. Principal contractors hold additional duties under the WHS Regulation, including that they must: • ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace and anything arising from the workplace are without risks to the health and safety of any person, • prepare a written WHS management plan for the workplace, • ensure, so far as is reasonably practicable, that each worker is made aware of the content of the WHS management plan before they start work, • review and as necessary revise the WHS management plan to ensure that it remains up to date, • establish and maintain consultation arrangements with other PCBUs, contractors, subcontractors and workers, • manage risks associated with the construction project, • ensure a Safe Work Method Statement (SWMS) is prepared for high risk construction work, • take all reasonable steps to obtain a copy of the SWMS and ensure it is followed when conducting high risk construction work, • put in place arrangements for ensuring that PCBUs and other duty holders comply with their obligations under the WHS Regulation. When engaging specialist businesses and/or workers to deliver specific works, a Principal Contractor should: • verify that mobile plant supplied is suited to task and maintained, • ensure there are processes for the verification of worker competency in the operation of mobile plant, • ensure workers are inducted to the site requirements.

Duty holder	Application
PCBUs working on construction projects, including principal contractors and subcontractors WHS Act section 19	Subcontractors must: • work within the requirements of the WHS management plan, • develop SWMS for the high risk construction work that they control, • verify that works are being completed in accordance with SWMS, • verify that any mobile plant used or supplied is suited to work and maintained, • ensure workers are provided with suitable and adequate information, training and instruction in completing the required work.

1.3 Consultation

This table includes recommendations in how to comply with the WHS legislative requirements.

Duty / Provisions	Application
Consulting workers WHS Act sections 47-49	• PCBUs have a duty to consult with workers, so far as reasonably practicable, on WHS matters which affect them. • Consultation is a two-way process with workers to identify WHS issues, share information, give workers a reasonable opportunity to express views and take those views into account before making decisions about health and safety matters. • While consultation may not always result in agreement, agreement should be the objective as it will make it more likely the decisions are effective and actively supported. • Workers should be encouraged to report hazards and health and safety problems immediately so the risks can be managed before an incident occurs. • If workers are represented by a health and safety representative, the consultation must involve that representative. • Workers must be advised of consultation outcomes in a timely manner. • PCBUs must have effective mechanisms to consult with workers, including when: — identifying hazards and assessing risks, — making decisions about ways to eliminate or control risks, — changing or updating workplace facilities, — proposing changes that may affect the health and safety of workers, — making decisions about consultation procedures, resolving safety issues, monitoring workers' health and conditions, and providing information and training, — selecting new equipment, — introducing new tasks, changing existing tasks or carrying out work in new environments.

Duty / Provisions	Application
Consulting, cooperating and coordinating activities with other duty holders WHS Act section 46	• PCBUs must, as far as reasonably practicable, consult, cooperate and coordinate activities with all other persons who have a WHS duty in relation to the same matter. • Often there is more than one PCBU involved in moving plant with responsibility for the same matter. See Figure 1. • Duty holders should exchange information about who is doing what to ensure effective coordination of works and management of risks, this includes: — identifying hazards involved with the use of plant, with consideration to any concurrent work around the plant, — assessing works scheduling to eliminate or minimise interface between contractors and moving plant operations, — deciding on control measures to be applied to ensure risks are eliminated or minimised, — determining sufficient access, space, and time for works to be completed safely, — the PCBU engages workers to carry out work, — the PCBU directs or influences workers in carrying out work, — other persons may be put at risk from work carried out in their business or undertaking, — the PCBU manages or controls a workplace or the fixtures, fittings or plant at a workplace, — the PCBUs business or undertaking involves designing, manufacturing, importing or supplying plant, substances or structures for use at a workplace, — the PCBUs business or undertaking involves installing, constructing or commissioning plant or structures at a workplace. • PCBUs should record the consultation arrangements in the WHS management plan for the site.

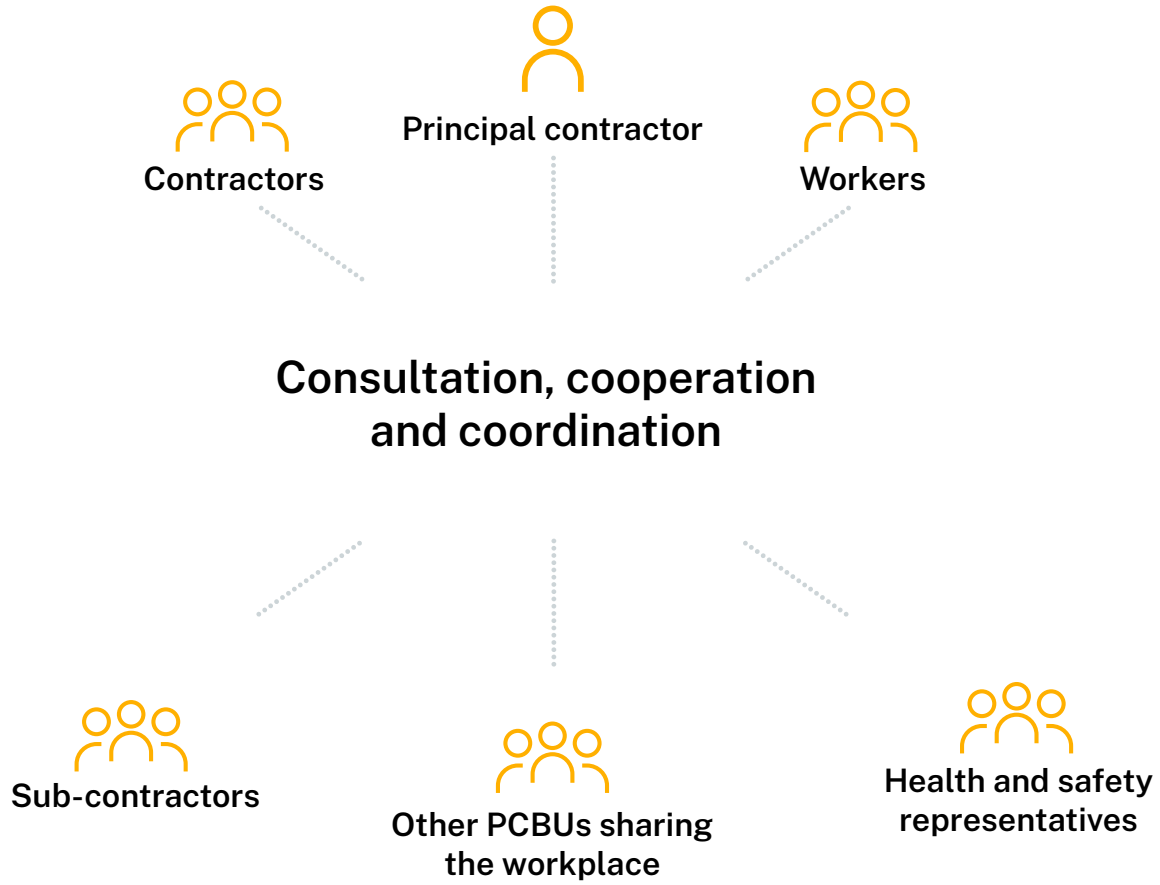

Figure 1: WHS consultation, cooperation and coordination

Further guidance on consultation requirements is available in the *Code of practice: Work health and safety consultation, cooperation and coordination.*

1.4 Information, training, instruction and supervision

Duty / Provisions	Application
Information, training, instruction or supervision WHS Act section 19 WHS Regulation section 39	• PCBUs must provide any information, training, instruction, or supervision necessary to protect all persons from health and safety risks, including when using plant. • The information, training and instruction: — must be suitable and adequate for the nature of the works, risks and control measures implemented, — must be readily understandable to the person it is being provided to, so far as is reasonably practicable, — should be supported by relevant safe work procedures, i.e. emergency procedures, traffic rules, PPE, — training should be provided to workers by a competent person, — training programs should be practical and 'hands on' and take into account the particular needs of workers.

Refer to chapter 8 Operator and worker competency, for relevant requirements for moving plant on construction sites.

2. Risk management process

Risk management is a systematic process to eliminate or minimise the potential for harm to people.

2.1 Hierarchy of control

The hierarchy of control measures set out in Part 3.1 of the WHS Regulation can be applied in relation to any risk.

The WHS Regulation makes it mandatory for duty holders to work through this hierarchy when managing certain risks. The sections that require the process in Part 3.1 to be followed are set out below.

WHS Regulation reference
Chapter 3 General risk and workplace management, Part 3.2 General workplace management
Division 6 Remote or isolated work, Section 48 Remote or isolated work
Division 8 Hazardous atmospheres, Section 51 Managing risks to health and safety
Division 8 Hazardous atmospheres, Section 52 Ignition sources
Division 10 Falling objects, Section 54 Management of risk of falling objects
Division 11 Psychosocial risks, Section 55C Managing psychosocial risks
Chapter 4 Hazardous work, Part 4.1 Noise
Section 57 Managing risk of hearing loss from noise
Chapter 4 Hazardous work, Part 4.2 Hazardous manual tasks
Section 60 Managing risks to health and safety
Chapter 4 Hazardous work, Part 4.3 Confined spaces
Division 3 Duties of person conducting business or undertaking, Section 66 Managing risks to health and safety
Chapter 4 Hazardous work, Part 4.4 Falls
Section 78 Management of risk of fall
Chapter 4 Hazardous work, Part 4.7 General electrical safety in workplaces and energised electrical work
Division 2 General risk management, Section 147 Risk management
Chapter 4 Hazardous work, Part 4.8 Diving work
Division 3 Managing risks-general diving work, Section 176 Management of risks to health and safety
Chapter 5 Plant and structures, Part 5.1 General duties for plant and structures
Division 7 General duties of a person conducting a business or undertaking involving the management or control of plant, Section 203 Management of risks to health and safety
Division 7 General duties of a person conducting a business or undertaking involving the management or control of plant, Section 214 Powered mobile plant — general control of risk
Chapter 6 Construction work, Part 6.3 Duties of person conducting business or undertaking
Division 1 General, Section 297 Management of risks to health and safety
Division 3 Excavation work, Section 305 Management of risks to health and safety associated with excavation work
Chapter 6 Construction work, Part 6.4 Additional duties of principal contractor
Section 315 Further health and safety duties — specific risks
Chapter 7 Hazardous chemicals, Part 7.1 Hazardous chemicals
Division 5 Control of risk-obligations of persons conducting businesses or undertakings, Section 351 Management of risks to health or safety
Division 9 Pipelines, Section 391 Management of risks to health and safety by pipeline operator
Chapter 8 Asbestos, Part 8.4 Management of naturally occurring asbestos
Section 431 Naturally occurring asbestos

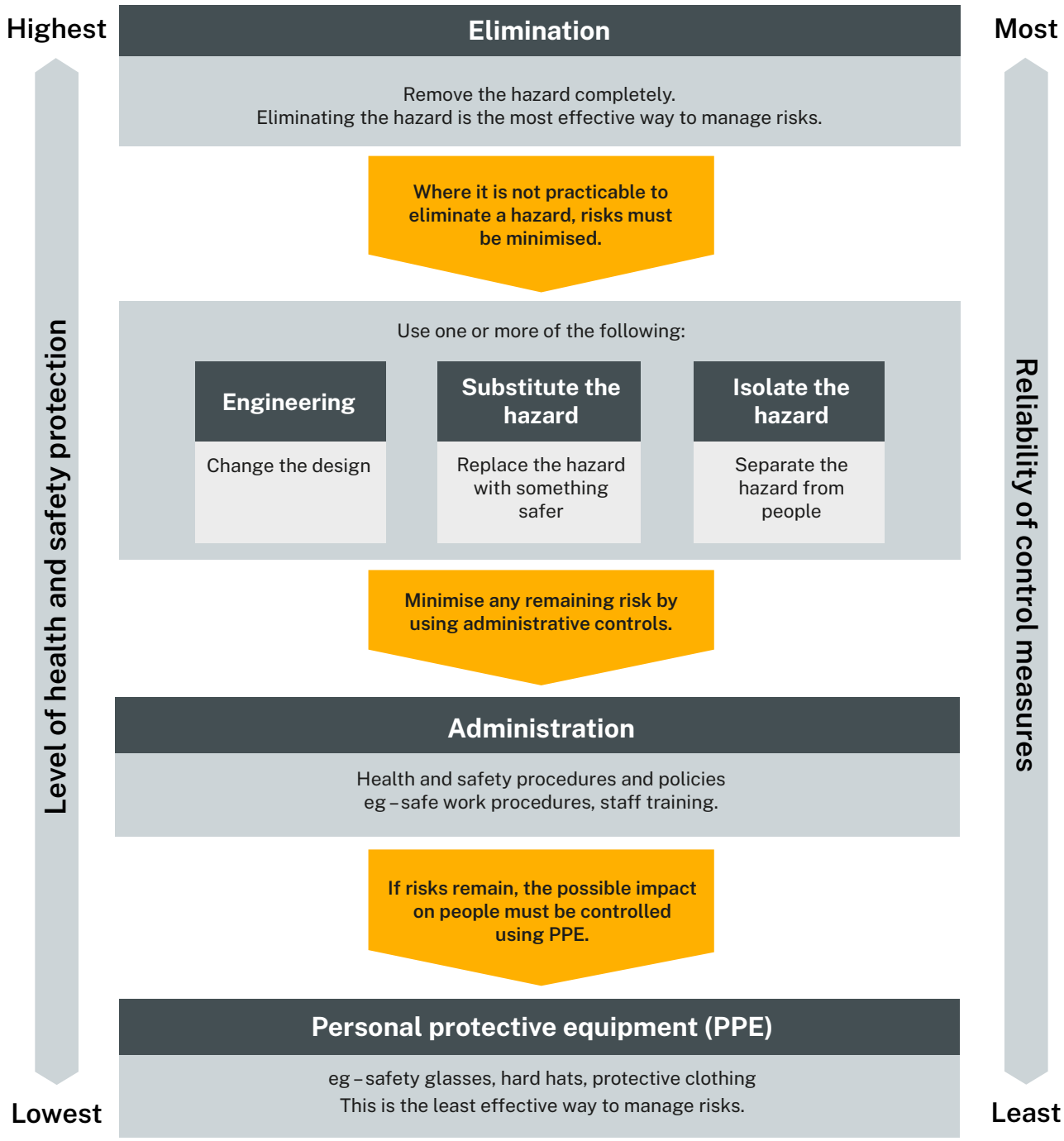

Figure 2: An overview of the hierarchy of control measures

Further risk management guidance is available in the:

- *Code of practice: How to manage work health and safety risks*
- *Code of practice: Managing psychosocial hazards at work*
- *Code of practice: Sexual and gender-based harassment*

3. Managing risks associated with moving plant on construction sites

PCBUs, including Principal contractors and subcontractors, must manage risks associated with moving plant on construction sites. This chapter provides an overview of common causes of harm, factors increasing the risk, and an application of the risk management process defined in Chapter 2.

3.1 Common causes of harm from moving plant on construction sites

The following points list common causes of harm involving moving plant on construction sites.

- Pedestrians / workers on foot being struck by moving plant while sharing the same work area such as access roads / paths, loading / unloading areas and entry / exit points (e.g. lack of separation, such as barriers, to separate people and moving plant).
- Moving plant coming into contact with workers on foot whilst reversing.
- Slewing moving plant (for example excavators) coming into contact with other plant and workers on foot.
- Workers on foot being struck or crushed while assisting the operation of moving plant (e.g. doggers, off siders, traffic controllers, line hands, spotters).
- Light vehicles being crushed or struck while interfacing with heavy vehicles.
- Workers on foot and plant operators being distracted by electronic devices (e.g. phones, tablets, headphones, etc.) giving rise to the risk of collision with other plant or persons.
- Inadequate communication methods between operators of moving plant and workers on foot contributing to the risk of persons being struck by moving plant.
- Poorly constructed, planned, designed and/or maintained access / exit roads, haul roads and/or loading and unloading areas, affecting the safe control and stability of moving plant, including failure to undertake risk assessments of these areas following weather events.
- Poorly maintained plant causing potential failure of brakes, steering and/or hydraulic systems, risking uncontrolled movements.
- Using mobile plant that relies solely on operators to apply park brakes (or other similar such as maxi brakes) to prevent roll aways.
- Conducting repairs and servicing to moving plant on-site where conditions increase risks. This can include uneven surfaces, gradients that place the moving plant at risk of roll away, unexpected movement of auxiliary attachments or systems, and/or exposure to stored energy within the mobile plant.
- Failure to use systems provided by the manufacturer to manage risks associated with ejection and moving plant roll-over. This includes failure to use a seatbelt.
- Failure to provide appropriate protective structures, such as roll over / falling objects protective structures, to prevent being struck / crushed while operating moving plant.
- Moving plant used outside its design parameters or intended use, such as:
  - overloading or exceeding the rated capacity,
  - extending loads outside the safe working radius,
  - exceeding slope and gradient capability,
  - use of plant on unsuitable supporting ground or structures,
  - alteration, modification or use of unapproved attachments.

- Moving plant transiting or operating near live overhead electric lines, resulting in contact or arcing. Mobile cranes, excavators, piling rigs, EWPs and tipper trucks experience higher electric line contact rates.
- Failing to provide adequate working structures or pads to prevent plant overturning. Depending on loads and certainty, structures and pads may be required to be engineered, constructed, tested and maintained.
- Recovery operations (bogged, rolled, or otherwise immobile vehicles), particularly those without specialist recovery equipment or planning by a competent person.
- Working with moving plant near embankments, cuttings, cross slopes, or on elevated positions (e.g. cliff edges) resulting in plant overturning or falling.
- Loading and unloading moving plant on and off transporting vehicles, resulting in:
  - being struck by plant and/or auxiliary equipment while directing loading / unloading,
  - falling from the transport vehicle or moving plant,
  - plant overturning while negotiating ramps or the trailer of the transport vehicle.
- Soil clods, rocks, and other materials stuck in the undercarriage, draw bar, or dual wheel assembly of moving plant, falling when leaving a construction site.
- Operator entrapment between the moving plant and obstructions, for example an operator of an Elevating Working Platform (EWP) being trapped between the EWP and an overhead beam.
- Inexperienced operators, reckless actions of operators, and/or operators being unfit for work.

In addition to the common causes of moving plant incidents, PCBUs must identify any other site-specific hazards for each individual site and eliminate or minimise these risks. This can be in accordance with the risk management process in Chapter 2.

3.2 Factors increasing risks presented by moving plant

The use of moving plant poses a risk of death and serious injury. The following factors increase the risk associated with moving plant and must be considered when applying control measures.

- **Travelling speed:** Moving plant poses a higher risk as speeds increase. The stopping distance increases relative to operator reaction times and inertia.
- **Plant stability:** The plant stability can be affected by:
  - operating at high speeds,
  - overloading,
  - exceeding the manufacturers' capacity,
  - swinging loads,
  - uneven ground surfaces,
  - environmental factors (e.g. wind, operating on wet surfaces).
- ***Restricted operator vision from moving plant:*** Vision restrictions at the rear, sides, front and above the moving plant. This includes common restriction visions around:
  - moving components such as arms, booms, blades, and attachments,
  - the structural supports for the operator's cabin,
  - loads carried / suspended,
  - engine bays and hydraulic components,
  - counterweights,

- additional equipment / accessories added to the machine without adequate consideration of visibility implications, e.g. additional handrail or guardrails, fire extinguisher bottle and tanks, displays in the operator cab, etc.

- ***Restricted operator vision from the operational environment:*** Vision restrictions can occur due to the operational environment. Common restrictions include:
  - corners, crests, edges of excavated areas, stored material, and change of horizontal gradients,
  - dust or other environmental factors, such as windshield glare at night, sun glare during the day, and rain.
- **Multiple work activities with the same area:** Multiple work activities in a location increases the risks posed by moving plant due to operators and workers on foot delivering their assigned work in the same area.
- **Communication limitations:** Communication can be limited by site conditions such as high-noise environments, low-light environments, environments with vision limitations, and communication device coverage issues. PPE such as respirators may also reduce effective communication.
- **Electronic devices:** Electronic devices can create distractions for operators and ground workers increasing the risk of injury. Electronic devices include phones, tablets, earphones, radios and other similar devices.
- **Operator fitness for work:** Operators may present a higher risk when not fit for work. Considerations include fatigue / alertness, illness, medical conditions, medications, psychosocial conditions, and drug / alcohol effects. Environmental factors such as extreme heat or cold can also impact on fitness for work.
- **Serviceability and maintenance:** Where plant is not adequately maintained and does not adequately or reliably respond to the actions of an operator. For example, worn brakes and increased stopping distances or failure to conduct preoperational checks.
- **Selection and suitability:** Where plant is not suited to the task and work is being completed outside its capability or safe working capacity.

The above factors that increase the risk from moving plant must be considered when applying control measures to site operations and specific work tasks.

3.3 Applying the hierarchy of control to moving plant

Risk controls are necessary when moving plant is used on construction sites. Higher-order controls must be selected and implemented in all instances unless it is demonstrated that doing so is not reasonably practicable. Lower-order controls may be necessary to support primary higher-level controls. Refer to Figure 2.

The following sub-sections provide an overview of potential controls against the hierarchy provided in WHS legislation. It is noted that some controls could be classified in multiple sections of the hierarchy.

Eliminating risks

Where reasonably practicable, eliminate the risk presented to workers by moving plant. Elimination can include:

- coordinating and sequencing work to prevent workers on foot from working on-site when moving plant is in use,
- the use of automated / robotic work processes that do not require worker intervention,
- the use of temporary automated traffic control devices (such as boom gates / barriers, traffic lights, amber vehicle lights etc.) to remove human traffic controllers from the risk of being struck by moving plant.

Substituting with something of less risk

In situations where it is not reasonably practicable to eliminate, the risk must be minimised. For example, the risk may be lessened by implementing the following measures:

- remotely operated moving plant,
- the use of drones or other similar devices that minimises the need to transverse the site,
- using plant with higher operator vision (fewer vision restrictions),
- the use of smaller plant, plant with less requirement for ground worker intervention / assistance / operation, or other similar control.

Isolating the hazard from any person exposed to it

Where eliminating and substituting has not fully controlled the risk presented by moving plant, consider isolating moving plant from persons. Isolation can include:

- secured walking paths and pedestrian crossings,
- specific vehicle travel paths (access roads, haul tracks, etc.),
- segregation between light and heavy vehicles,
- secured working areas for moving plant,
- dedicated turning bays,
- specific loading / unloading areas.

When isolating areas, generally it is a preference to use crash-resistant barriers (i.e. concrete or water filled plastic barriers or earth berms). Ensure these barriers are sufficient for the size and weight of the plant and are installed as per the manufacturer's specifications.

Where supported by a risk assessment, non-crash resistant barriers can be used. These include fencing, boom gates, pedestrian gates, solid bunting, or flagging. The risk presented by entrapment between moving plant and crash-resistant barriers is to be considered when choosing between crash and non-crash resistant barriers. All crash and non-crash resistant barriers should have the support of administrative controls such as speed limits and directional signage.

Implementing engineering controls

Where risks remain, consider implementing engineering controls. These controls can include:

- moving plant / truck turn tables,
- reversing and other vision-improving cameras and in cabin displays,
- proximity warning sensors (both object sensing and wearables on a person),
- proximity sensors that automatically cease operation of plant (including appropriate run-down times / distances),
- speed limiters,
- slew / luff limiters during operation,
- angle and tilt gyroscopic interlocking systems,
- auditory and visual warnings for plant movements (e.g. vehicle motion alarms, reversing alarms, flashing light

systems, or reversing light systems),

- camera / laser technology with AI integration,
- dynamic systems (such as collision avoidance),
- interlocking systems including operator “dead man” switches and vacant seat sensing devices,
- Load Moment Indicators (LMI),
- use of telematics (plant tracking including speed, location, and geofencing),
- rollaway prevention devices such as park brake / maxi brake alarm,
- truck and trailer side underrun protection to minimise the likelihood of entry between axle groups,
- exclusion zone alert technology,
- onboard preventative maintenance tracking systems,
- location and information systems (e.g. GPS locators),
- use of plant behaviour technology,
- overhead electric lines detection technology.

Administrative controls

If a risk still remains, administrative controls should be implemented in conjunction with higher-level controls. Administrative controls can include:

- establishing Moving plant zones (see chapter 5), Traffic management plans and Vehicle management plans (see chapter 10),
- specific training for staff on:
  - moving plant hazards,
  - blind spots for the plant used on-site,
  - site rules applicable to moving plant, including any exclusion / restricted access zones,
- planning delivery schedules and systems to communicate site requirements and rules to delivery drivers,
- setting up internal / external speed zones with appropriate signage and means to enforce operator compliance,
- escorting other vehicles or persons around or past work areas,
- ensuring only trained and competency-verified spotters aid moving plant,
- systems to verify the competency of mobile plant operators, spotters, doggers / riggers, and traffic controllers,
- prominent visual identification of spotters, (e.g. pink vests, arm bands, coloured hard hat),
- implementing a system to monitor moving plant operators and other workers compliance with safety requirements. This may include supervisors with authority to audit operations or breaches of site rules. Addressing unsafe operations may involve discussions, refresher training or corrective actions in accordance with agreed policy,
- establishing systems to encourage site workers to report unsafe plant and/or operations,
- incorporating communication systems, such as radio or two-way, for calling points and coordinating movement.

All control measures and combinations must be monitored for their effectiveness in managing the risk of moving plant on-site.

Personal protective equipment (PPE)

Where moving plant is used on a construction site, it is likely that risks may remain after higher order controls are implemented. As such appropriate PPE should be used based on the work and site risks.

Sites with moving plant risk should have high visibility clothing and protective footwear as a minimum standard. Additional PPE (e.g. hard hats, glasses) should be determined on a case-by-case basis.

Certain work environments, for example traffic control, works in rail corridors, works in airports, and tunnelling, have sector specific PPE requirements. These should form the minimum standard for PPE on applicable sites.

3.4 Maintenance and review of control measures

Control measures must be maintained so they remain fit for purpose, suitable for the nature and duration of work, and are installed, set-up and used correctly. Control measures must be regularly reviewed so that they remain effective. A review is necessary:

- when the control measure proves ineffective in managing the risk,
- before implementing a workplace change, that may introduce a new or different health and safety risk that the current control measure may not effectively manage,
- upon identifying a new hazard or risk,
- if unsafe operations or work practices are identified,
- in response to consultation with workers indicating the need for a review,
- if a health and safety representative requests a review.

4. Site management and controlling the risks of moving plant

PCBUs must manage risks associated with moving plant on construction sites. This chapter provides details to assist with the site management aspects of controlling the risks presented by moving plant. This includes provisions for accepting plant onto site, requirements for maintenance, operator verification of competency, supervision, and communication.

4.1 Establishing management systems for construction projects

The WHS legislation has specific requirements for Principal contractors, such as the development of a WHS management plan. A WHS management plan must include:

- the names, positions and health and safety responsibilities of all persons at the workplace whose positions or roles involve specific health and safety responsibilities in connection with the project,
- the arrangements in place, between any PCBU at the workplace where the construction project is being undertaken, for consultation, co-operation and the co-ordination of activities in relation to compliance with their duties under the WHS Act and Regulation,
- the arrangements in place for managing any work health and safety incidents that occur,
- any site-specific health and safety rules, and the arrangements for ensuring that all persons at the workplace are informed of these rules,
- the arrangements for the collection and any assessment, monitoring and review of SWMS at the workplace.

The planned approach to managing moving plant risk should be reflected in the WHS management plan.

A PCBU carrying out high risk construction work, including work where there is any movement of powered mobile plant, must prepare a SWMS for the proposed work. The SWMS and WHS management plan provisions should align to effectively control the risk presented by moving plant.

The WHS management plan should have provisions to confirm the suitability of plant, verify the competency of operators, establish systems to address unsafe operation of plant, establish the requirements for communication across the site, and ensure a plan to address emergencies.

4.2 Confirming suitability of plant

PCBUs must have systems of work in place to confirm the suitability of plant. Systems of work should include confirmation that the plant is:

- verified by a competent person that it is fit for purpose and suitable for the task,
- suited to the intended work task, i.e. the plant is capable and able to perform the required functions,
- suitable to be used in combination with other moving plant where required as a part of work,
- used within the rated capacity in relation to the work being undertaken,
- suitable for the operational conditions e.g. the gradient of the ground (including transport access to / from the site),
- only fitted with attachments that are compatible with the plant,
- certified by a competent person should any modifications have been made to the plant.

PCBUs must obtain any relevant information to assist them in confirming the suitability of plant, and have this information readily available. Information must be readily available and provided to relevant persons. Where

manufacturer / supplier recommendations are not well defined, the PCBU(s) must engage the services of a competent person (for example, a plant or geotechnical engineer) to define the operational limitations (e.g. ground conditions, load capacity, suitability to work on various gradients, etc.).

Confirming moving plant is suitably maintained

Before moving plant is accepted onto site, ensure that the plant has been suitably maintained. Confirmation that the maintenance, inspection, repairs and servicing has been completed can be achieved by:

- reviewing physical logbook records confirming maintenance and certification of plant,
- reviewing reports from electronic systems that track, record, and confirm that servicing and maintenance has been completed (note: electronic systems should not restrict information, records should remain suitably accessible to workers, managers, inspectors and others completing site works),
- reviewing records from industry-based third-party certification programs,
- undertaking plant inspections, audits, and/or verifications of moving plant before its acceptance onto site.

Maintenance programs

Moving plant, including any attachments fitted, must be maintained in a condition to ensure safe operation. To achieve this, the maintenance program must follow the manufacturer's specified servicing schedule. Where these are unavailable, a competent person must determine maintenance and servicing requirements. The competent person should consider relevant Australian Standards, industry recommendations and known maintenance issues with the specific type and general class of plant.

Manufacturers provide scheduled time / usage-based checks of plant. Generally, these include pre-operational inspection, routine maintenance, annual inspection, and major inspection. A maintenance program should follow these requirements. Further information is provided in Appendix B.

4.3 Systems to verify operator competence

PCBUs should ensure that there is a system to verify that operators hold the relevant experience, and where required, the appropriate HRWL to operate plant. Systems to ensure competency must consider the type, make and capacity of the plant and its specific operational systems.

Moving plant on construction sites may be required to be operated in high difficulty environments or challenging conditions (rougher terrain, higher gradient slopes and restricted access). Such applications / environments may require further assessment of operator skills and knowledge to ensure competency is adequate. Where training and upskilling is a factor, additional instruction, information provision, task observation, and closer or more frequent supervision may be required.

4.4 Systems to address unsafe operation of moving plant

PCBUs must establish a system to address unsafe operation of moving plant. Supervisors (or similar staff) must be trained in these systems. Systems addressing the unsafe use of plant should include:

- appropriate site supervision,
- monitoring of compliance with SWMS,
- ceasing unsafe or non-compliant operations,
- methods to address identified unsafe use of moving plant, this can include discussions, refresher training, corrective actions, warnings and incident investigation.

4.5 Requirements for communication systems

PCBUs should ensure that their systems of work facilitate positive communication between plant operators and workers on foot. Positive communication means receiving a response or acknowledgment in relation to communication given.

PCBUs must train workers in the communication system. PCBUs should have a system to identify, confirm, and if necessary, take reasonable action to ensure that communications systems are functional.

Where moving plant is used on larger or more complex sites, PCBUs should ensure that a communication system is in place. The system should ensure:

- items of moving plant have means to be identified (call sign, placards, or labels),
- entry points to the site are clearly marked and identified,
- operators and workers have means of effective communication,
- controls implemented under this Code can be coordinated and implemented.

Communication systems can include:

- site wide public address system,
- the use of radios, two-ways, and other similar systems,
- dedicated site and/or area radio bands (trunked radios),
- dedicated call points at set areas,
- telematics and other systems such as GPS,
- signage, placards, and decals used to identify plant, areas and vehicles,
- where appropriate, the use of visual and hand signals.

PCBUs must ensure suitable training and instruction is provided to workers and persons regarding:

- the use of the communication system,
- any associated work and behavioural practices, and
- what to do if systems go down.

Complex and/or large sites may require surveying to ensure communication black spots are identified and managed to maintain continuity of communication. An example of managing a black spot is the use of a UHF repeater station.

4.6 Working alone

Working remotely or in isolation can impede access from rescue, medical or emergency services, due to the location, time or nature of work being done. Working alone may also increase workers risk to threats of violence or harm. The PCBU must manage the risks associated with remote or isolated work and consider:

- the length of time the person may be working alone,
- the time of day when a person may be working alone,
- a communication plan with workers,
- the location of the work and the environment,
- the nature of the work, as well as the skills and capabilities of the worker including any medical considerations.

In managing the risk, the PCBU must provide a safe system of work that ensures effective communication with the worker. To achieve this:

- monitor workers regularly, by effective communication systems (e.g. mobile phone, radios) or periodic visits,
- have a check-in process whereby workers are required to contact 'home base' at a nominated time,
- have an emergency response plan when workers fail to report in at agreed times.

4.7 Emergency plan

Workplaces must have an emergency plan that has been specifically developed for the work and its specific hazards. Workers must receive information, training, and instructions about implementing the emergency plan.

Procedures within the plan must confirm:

- an effective response to an emergency,
- evacuation procedures,
- notifying emergency service organisations at the earliest opportunity,
- medical treatment and help, and
- effective communication between the person authorised by the PCBU to coordinate the emergency response and persons at the workplace.

Emergency Plans must remain relevant and effective. This can be achieved by testing the plan by conducting emergency drills at regular intervals.

5. Moving plant zones

The systems that support moving plant safety should include defining moving plant zones. The following zones generally apply - Plant only zones, Plant operating and restricted personnel zones, and Plant hazardous zones.

Moving plant zones should be defined, categorised and applied on-site. Moving plant zones should be reflected in the overarching WHS management plan and in associated SWMS.

5.1 Plant only zones

This is an area where only moving plant operations occur. Whenever possible, establish a plant only zone. The plant only zone should:

- be easy to identify,
- be communicated to all workers on-site,
- have barriers to prevent entry of workers on foot,
- include a system to cease moving plant operations where workers on foot enter the area (for example where workers are leaving the area for meal or amenity breaks),
- include a system for communication between moving plant operators and other site workers,
- ensure the plant remains contained within the zone,
- be of sufficient size to complete works safely, with no additional or following trades encroaching on the space until the activity / task is complete.

5.2 Plant operating and restricted personnel zones

Plant operating and restricted personnel zones involve both moving plant, and workers on foot that are required to work in conjunction with moving plant.

This may be required, for example, when a worker is guiding high precision excavation work or when a worker is required to dog a mobile crane.

The plant operating and restricted personnel zones should:

- be easy to identify,
- be communicated to relevant workers on-site,
- have barriers to prevent entry of unauthorised workers on foot,
- include a system of communication between moving plant operators and workers on foot operating in the restricted zone,
- be of sufficient size to complete works safely, with no additional or following trades encroaching on the space until the activity / task is complete,
- be restricted to include only workers on foot and moving plant operators that have been trained with respect to the functions, movements, blind spots, and hazardous areas (pinch, crush, slew area etc.) of the moving plant,
- clearly identify any specific plant hazardous zones and have systems to verify that workers do not enter the hazardous zone.

5.3 Plant hazardous zones

In limited circumstances, a worker on foot may be required to work within a hazardous area associated with moving plant. A hazardous area is any area where the operations of the plant create a higher risk of contact and injury. Examples include a dogger using a tag line to assist an articulated crane pick and carry a load, or a driller assisting with piling works immediately adjacent the auger.

So far as is reasonably practicable, no worker should be in the hazardous zone of any moving plant. Where no other reasonable system of work is available, both the operator and the worker in the hazardous zone should be supported by:

- systems of communication between the moving plant operator and worker in the hazardous zone,
- providing a work area of sufficient size to complete works safely, with no additional or following trades encroaching on the space until the activity / task is completed,
- ensuring that only workers on foot and moving plant operators that have been trained with respect to the functions, movements, blind spots, and hazardous areas (pinch, crush, slew areas etc.) are involved in tasks where a worker enters a hazardous zone,
- the operator of the moving plant ceasing operations whilst the worker is in the hazardous zone, or the operator has not received positive communication that the worker isn't in the hazardous zone.

Refer to Figures 3, 4 5 for examples of types of barriers (visual and physical).

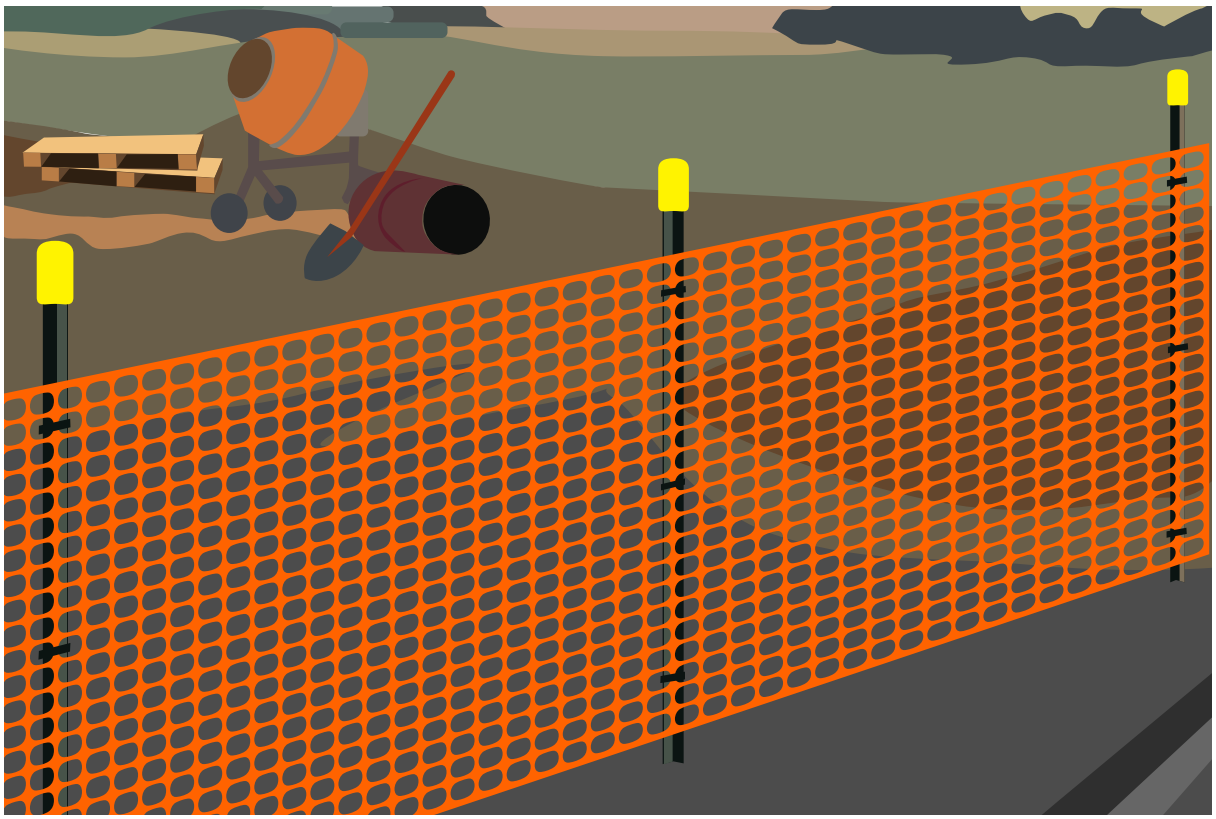

Figure 3: Example of mesh barrier and star pickets.

Figure 4: Example of a jersey kerb barrier.

Figure 5: Example of bollards and bunting barrier.

6. Specific controls for common risks involving moving plant

This chapter sets standards for controlling the risks of moving plant in common applications. Follow the measures below in combination with the broader controls recommended in this Code. Alternative controls of an equivalent or higher standard of safety may also be used.

6.1 Operator protective devices

A combination of controls to prevent an operator from being struck by objects, ejected, or crushed must form part of a system for the safe use of moving plant. This should include a combination of the following:

- appropriate operator protective structures, e.g. Rollover Protective Structure (ROPS), Falling Object Protective Structure (FOPS) and Operator Protective Guards (OPG),
- devices which have been designed to prevent operator ejection, e.g. seatbelts.

To support systems to prevent operators being ejected from moving plant:

- operators must wear the fitted seatbelt correctly where it forms part of the system to prevent ejection, and ensure seatbelts are fit for purpose and maintained in accordance with manufacturer's guidelines,
- plant should be fitted with interlocks and auditory warnings, or other similar devices, to prevent operation when seatbelts and other protective systems are not used,
- PCBUs shall have a system of supervision to identify, confirm, and if necessary, take reasonable action to verify that protective devices are used correctly. This could include discussions, re-induction, re-training, warnings, or similar.

6.2 Operators to remain at the controls of moving plant

Remaining at the controls of live moving plant minimises the likelihood of clothes catching or body movements inadvertently hitting the controls. Unless plant is specifically designed to be used by an operator that has other tasks, and a suitable method protecting the controls is in place, PCBUs should establish systems of work to:

- allow an operator to remain at the controls of the moving plant at all times that the plant is live,
- not require the operator to undertake other tasks concurrently while in control of the moving plant,
- ensure that the plant is isolated to prevent inadvertent movement or unauthorised use when the operator may have to leave the controls.

6.3 Vision assistance devices and movement warning devices

Vision assistance devices (mirrors, cameras or other similar devices fitted to plant by manufacturers) and movement warning devices (beepers, lights or similar fitted to plant by manufacturers) are critical safety requirements. These supplement the operator's direct field of vision and serve as an aid to the operator in seeing people or obstacles around the plant. They also provide a warning to workers on foot that moving plant is operational in the area. When there is damage, incorrect adjustment, or no functionality, the moving plant should not be used and removed from service.

PCBUs should have a system to identify, confirm, and take reasonable action to ensure that no one uses the plant if critical safety provisions are not functional. This system should include checks and Lock Out Tag Out procedures for unsafe plant.

6.4 Suspended loads

Being struck by suspended loads is a common harm associated with moving plant. Lifting and suspending of loads is not restricted to conventional crane work and can involve a range of moving plant. Key aspects to consider when lifting or suspending loads from moving plant are:

- only plant specifically designed to suspend loads should be used for this purpose,
- all associated equipment (slings, cages, spreader bars, hitches, etc.) must be fit for purpose and maintained appropriately and affixed with an inspection tag (or similar indicator),
- lifting points / lifting lugs must be suitably designed, rated and approved and reinspected periodically or after damage,
- any worker that slings loads shall be appropriately trained and where applicable hold a HRWL,
- systems of work must be implemented to ensure that workers do not work under suspended loads, unless the plant is specifically designed for that purpose. These can include:
  - removing workers from the lift and travel path of the suspended load before the load leaves the supporting surface (ground, truck, etc.),
  - engineering controls that remove the need for a dogger to physically control or stabilise loads,
  - tag lines to separate a dogger from the travel path of the load.

Where the complexity of the lift or the loads involved require additional planning, a lift study should be conducted. A lift study examines:

- the requirement to lift – is there another safer way to shift the load?
- size and weight of the load – planning for equipment with safe capacity to lift the load,
- locations of uplift and landing – path of travel is suitable and free from obstruction, safe working radius or limits will not be exceeded,
- capacity of the plant – within the safe limits to lift the load, including slope, cross slopes and weather conditions (e.g. high wind),
- specific lifting equipment – specialist equipment needed,
- supporting structures or ground – suitable to withstand the proposed loadings,
- worker competency – workers are competent and are appropriately licenced for the class of high risk work being undertaken,
- consultation and collaboration with subject matter experts.

6.5 Pick and carry operations

Where it is required for plant to pick up a load and carry it to another location by articulated cranes, telehandlers, excavators, forklifts, or other equipment, the PCBUs system of work should ensure that:

- only plant specifically designed to suspend loads is used for this purpose,
- plant is confirmed to have sufficient capacity and suitability to the operational environment, for example the plant must be rated to the front, back and side slopes encountered in the travel path,
- the load is as low as possible at all times to improve the stability of the pick and carry operations,
- the travel path is assessed and confirmed before the pick and carry operation takes place,
- so far as is reasonably practicable, the moving plant undertaking the pick and carry operation is isolated from other workers,

- if a worker is required to assist, the distance of any worker on foot to the pick and carry operation considers:
  - the speed of the moving plant,
  - any reduced vision caused by the load being carried,
  - the difficulty of the terrain,
  - the reach envelope of the plant should it roll,
  - the ability to communicate with the operator,
  - the likely direction the plant will roll should an incident occur.

Systems of work must be implemented to ensure that workers do not work under suspended loads. These can include:

- removing workers from the lift and travel path of the suspended load before the load leaves the supporting surface (ground, truck, etc.),
- engineering controls that remove the need for dogger to physically control or stabilise loads,
- tag lines to separate dogger from the travel path of the load.

6.6 Loading and unloading areas

Loading and unloading operations should be separate from the working / operational areas of the construction site. Establish loading and unloading areas:

- on solid and levelled surfaces,
- of sufficient size,
- not near overhead electric lines,
- excluded from workers on foot.

If a loading / unloading area is not level, ensure that the moving plant used is rated to the conditions.

The impacts of wind, rain, mud, snow, ice and wheel rutting should be considered and where necessary repairs be made to the loading / unloading area.

Tilt tray / tipping trucks are known to roll when the tray is elevated due to side and rear gradients. The loading / unloading area should be consistent with the capabilities of the moving plant used.

6.7 Moving plant in difficult terrain

Difficult terrain can include rocky terrain, steep drop offs, high vegetation areas, embankments, slopes, gradients and areas subject to severe environmental conditions (for example flooding, snow and ice). Where moving plant is used in difficult terrain, PCBUs must have systems to ensure that:

- the moving plant is rated by the manufacturer for use in the applicable terrain,
- the verification of competency process confirms that the operator has sufficient:
  - experience in operating moving plant in the applicable difficult terrain,
  - awareness of the limitations of plant including rated gradients and the effect of gradients on load shifting.

Restrictions on ground workers being in proximity to plant should be imposed.

6.8 Working in proximity to edges

Plant tip over is associated with working in proximity to trenches, culverts, drains, onsite detention tanks, dams, overhangs, embankments, soft edges and retaining structures.

Where work is required in these conditions:

- where appropriate, areas should be assessed by a competent person, e.g. geotechnical engineer, before loading or after significant change,
- the “zone of influence” associated with any works is identified and delineated,
- where appropriate, assist operators with alignment technology, barriers, wheel stoppers, or a spotter to guide works near edges presenting the risk of roll over.

6.9 Remote control and automated moving plant

Remote operation and/or automated moving plant can be an effective control to prevent harm in hazardous environments. Remote operated and/or automated plant may be suited to works around cliffs, watercourses, unstable ground, demolition, or other identified high-risk environments. Where remote control plant is used:

- it must be fit for purpose,
- it must be designed to fail to safe if connectivity is lost or in the event of a malfunction,
- it should be separated from ground workers,
- operators of remote control plant should have suitable unobstructed vision - this could be achieved from controller positioning, cameras, sensors, spotters or other suitable means.

Where automated plant is used it must have appropriate systems to reliably detect and stop before:

- colliding with workers or other objects,
- encroaching on circumstances likely to cause harm (such as geofencing, proximity to electric lines, explosive environments, water inundation, over capacity movements or other similar harm).

6.10 Moving plant operating near water

Where moving plant work involves a risk of the plant being submerged and the operator drowning, systems of work should include:

- installing electronic guidance systems, barriers, wheel stops, or similar, to prevent the plant entering water,
- clearly identifying drop offs, soft edges, and similar that may increase the risk of plant rolling over into the water,
- where the above is not practical, consider the use of spotters to guide the plant,
- the requirements of any water rescue, including the need for:
  - the number and placement of emergency floatation devices and personal floatation devices (if appropriate),
  - enclosure exit equipment (e.g. equipment to break windscreens),
  - specialised rescue equipment (e.g. rescue skiff) and resuscitation equipment,
  - appropriate personnel including spotters and those trained to affect a water rescue.

6.11 Falls from mobile plant

Working in or around plant may present a risk of falls. Falls may occur during:

- loading and unloading plant from transport vehicles,
- entering and exiting the cabin of the mobile plant,
- accessing areas of the mobile plant that is not designed to accommodate persons working in those areas.

Controls such as adequate work platforms, access steps, stairs and ladders, guard rails / edge protection and anti-slip surfaces can help manage the risk of falls from mobile plant.

Guidance for access to operator stations and routine maintenance points on earth moving machinery is provided in Australian Standard *AS 5327:2022 Earth-moving machinery – Access systems*. For further guidance on working safely at heights refer to the *Code of practice: Managing the risk of falls at workplaces*.

6.12 Loading and unloading mobile plant

Mobile plant is frequently transported to site by road registered heavy vehicles (floats, low loaders or similar). There may be a requirement for specialist transport arrangements and equipment. Systems of work implemented by PCBUs must consider:

- the maintenance status of the delivery vehicle including hydraulic rams for ramps,
- where possible, the delivery area for the mobile plant is level, hard standing and sufficiently compacted to ensure safe unloading,
- loading ramps must be:
  - of sufficient rated capacity,
  - attached by positive means (secured via bolt, pin, or other fixed system) to prevent disengagement (they must not rely on hydraulic pressure to stay engaged),
- isolating the load / unloading area from workers on foot,
- isolating the rear of the delivery vehicle when ramps are being lowered and positioned by mechanical means,
- the use of electronic guidance systems, wheel guides, or other systems that suitably guide the tracks / tyres of the moving plant being unloaded,
- where a spotter is required, the spotter must be separated from both the travel path and likely fall and roll envelope of the moving plant being unloaded or loaded,
- the lighting and environmental conditions relevant to the delivery / pick up time,
- the competence of the operator unloading / loading the plant (including the delivery vehicle operator where they undertake loading / unloading of the moving plant),
- if traffic control is required.

6.13 Changing moving plant attachments

Where the plant uses different attachments to perform a range of functions, PCBUs must have systems to verify that the attachments are compatible with the specifications. PCBUs must establish suitable systems of work for workers changing attachments, such as buckets and rock hammers on excavators. Systems of work must confirm that:

- only competent persons change attachments,
- change attachments are as per the manufacturer's instructions,
- the area for attachment changing is isolated,
- where needed or recommended by manufacturers, appropriate cradles, tools, or other similar supports shall be used to prevent attachments falling, sliding, dropping, or similar during the attach / detaching process,
- competent persons assisting the changing of attachments:
  - the assisting worker shall be in direct visual contact with the operator, or a communication system is used, such as radios,
  - the plant should be isolated where practicable,
  - where isolation is not practicable, ensure the plant is under the control of the operator, with only necessary operational movement,
  - establish positive communication before movement.

6.14 Excavator and backhoe quick hitches (quick couplers)

PCBUs should not use 'semi-automatic' and 'automatic – detach only' type quick hitches. Specifically, PCBUs should:

- prevent these types of quick hitches from being used on-site,
- cease use of these hitches,
- not operate plant with these hitches.

PCBUs should ensure that hitches used on-site meet the requirements of Australian Standard *AS 13031:2023 Earthmoving machinery - Quick couplers - Safety*.

To prevent unintended detachment from mechanical and fully automatic quick hitches:

- ensure attachments are compatible with the hitch, including pin centres, pin diameters and clearances between the attachment and the housing,
- ensure hitches are compatible with the host machine,
- ensure the hydraulic circuit provides adequate pressure to retain the attachment,
- verify correct engagement of the primary retention system,
- verify correct engagement of the safety device (locking device),
- prevent unintended activation of controls used to disengage the hitch,
- perform appropriate inspection and maintenance of the hydraulic system, hitch and attachment, including checking for excessive wear on the corresponding parts,
- for mechanical hitches the safety pin and lynch pin must be fitted and maintained.

Refer to SafeWork NSW Position Paper *Supplying, installing and using quick hitches on excavators or backhoes*.

6.15 Elevated structures

Where works require the use of moving plant on elevated structures, such as suspended floors, bridges and other similar suspended structures, the PCBU must ensure that:

- elevated areas are of sufficient bearing capacity to support the plant and dynamic loads,
- delineation is used (bunting or other similar means) to establish a plant only zone,

- the risk of incorrect alignment or movement is minimised (e.g. operators should be assisted by alignment technology, barriers, wheel stoppers, or a spotter to guide works),
- the requirements of any other factor deemed relevant by a competent person are met.

A competent person, such as an engineer, must be engaged to verify loading, the impact of proposed works and any additional controls that may be required for the activity.

6.16 Dedicated site preparation

Some items of moving plant will require dedicated site preparation before transporting these items of plant to site. This is also required for offloading, moving into working positions, setting up, performing work and safely removing from site. Examples include mobile cranes and piling rigs.

PCBUs must ensure that dedicated site preparation is undertaken when required, this includes:

- planning and consultation with plant providers or contractors,
- engineered design and construction of access roads, ramps, and/or working platforms, and other similar structures,
- access roads, ramps, and/or working platforms, and other similar structures must be of sufficient size, capacity, have sufficient clearance, and provide enough room to safely undertake the required task (competent persons such as geotechnical, civil and structural engineers may be required).

6.17 Requirements for re-fuelling of moving plant on-site

Re-fuelling plant on-site is a known risk. PCBUs in consultation with the refuelling contractor (if applicable) must establish controls to ensure safety, including:

- refuelling workers are trained and competent in safe work procedures, spill containment, and emergency procedures, including isolating the refuelling area and using appropriate fire extinguishing equipment,
- availability and use of an appropriate spill kit,
- scheduling of refuelling, e.g. pre or post plant operational hour,
- compatibility of nozzle and flow settings across multiple equipment on-site to avoid over pressurisation.

Note: Some items of plant require cool down periods before refuelling. Where cool down times are required, such plant should be readily identified, systems of work should include banning of hot fuelling, and provide suitable cool down times considering the type of plant, its running temperature, length of operation before cooling down, and the ambient temperatures effect on cool down times.

6.18 Requirements for repair and maintenance of moving plant on-site

If a fault on moving plant is identified, which affects safe operation, PCBUs should move it to a safe location, isolated, and tagged out of service until the fault has been rectified by a competent person. Where practicable, servicing / repair should occur off site.

For maintenance / repairs on-site, PCBUs must establish controls to ensure the safety of the worker(s) undertaking site repair and maintenance. Measures should confirm that:

- mobile plant operators only undertake maintenance for which they are specifically trained and competent to undertake,
- specific site repair and maintenance workers are competent to perform the work required,
- site repair and maintenance workers must have the equipment to undertake the work safely,

- the site conditions in which the maintenance is undertaken do not add additional hazards to the work being undertaken,
- the site maintenance area should be effectively isolated from other moving plant or other hazardous operations on-site,
- repair and maintenance should be undertaken when the mobile plant is correctly isolated. This includes roll away prevention and petrochemical, electric, hydraulic, pneumatic, heated and/or other systems relevant to the plant. This should include the use of Lock Out Tag Out systems of work,
- there is no unexpected movement of auxiliary attachments or systems, and/or exposure to stored energy within the mobile plant.

Where these conditions are not met, do not perform maintenance on-site and take appropriate action to relocate the plant to a suitable maintenance facility.

6.19 Vehicle roll away

Vehicle roll away is a significant cause of harm associated with moving plant on construction sites. PCBUs must establish systems to prevent roll aways including:

- having vehicle inspected and maintained according to the manufacturer's recommendations,
- confirming operator competency, including knowing the limitations of the braking system and what may cause the brakes to release,
- consider using plant with seat-sensors, interlocked brakes, a fail-safe braking system, or anything that will prevent uncontrolled movements of the vehicle,
- consider using plant equipped with alarm systems that warns operators if braking systems are not correctly engaged,
- develop dedicated parking areas on the site,
- parking vehicles on level gradient surfaces, the utilisation of earth berms, wheel chocks and/or turning wheels into kerbs.

6.20 High noise environments and warning devices

In certain applications, confusion may occur where multiple moving plant are fitted with the same alarms or lights, making these warning devices ineffective. In such circumstances additional control measures should be considered. For example, combination audio-visual systems and white noise alarms may be more effective in environments where noise levels may vary.

6.21 Blind spots

Blind spots are associated with incidents involving moving plant. Blind spots can occur due to plant design and/or the site environment.

Plant design

PCBUs should give consideration to:

- reviewing blind spot diagrams contained in the manufacturer's operating manual,
- additional control measures, such as reversing cameras and proximity sensors,

Refer to Figure 7 for blind spot illustration examples for various items of plant.

Site environment

PCBUs should give consideration to:

- setting up the work site with view to minimising blind spots,
- separation and delineation systems, such as physical barriers, boom gates, etc.,
- establishing systems to have moving plant operators:
  - slow to no more than walking speed when negotiating blind spots,
  - identify the plant before negotiating the blind spot (for example, sound horn, radio calls, or similar),
- blind spots when workers on foot are approaching moving plant during operation. Before approaching moving plant, workers need to confirm verbal communication (i.e. via a two way radio) with the plant operator. Figure 6 demonstrates an example of how to approach plant safely following communication.

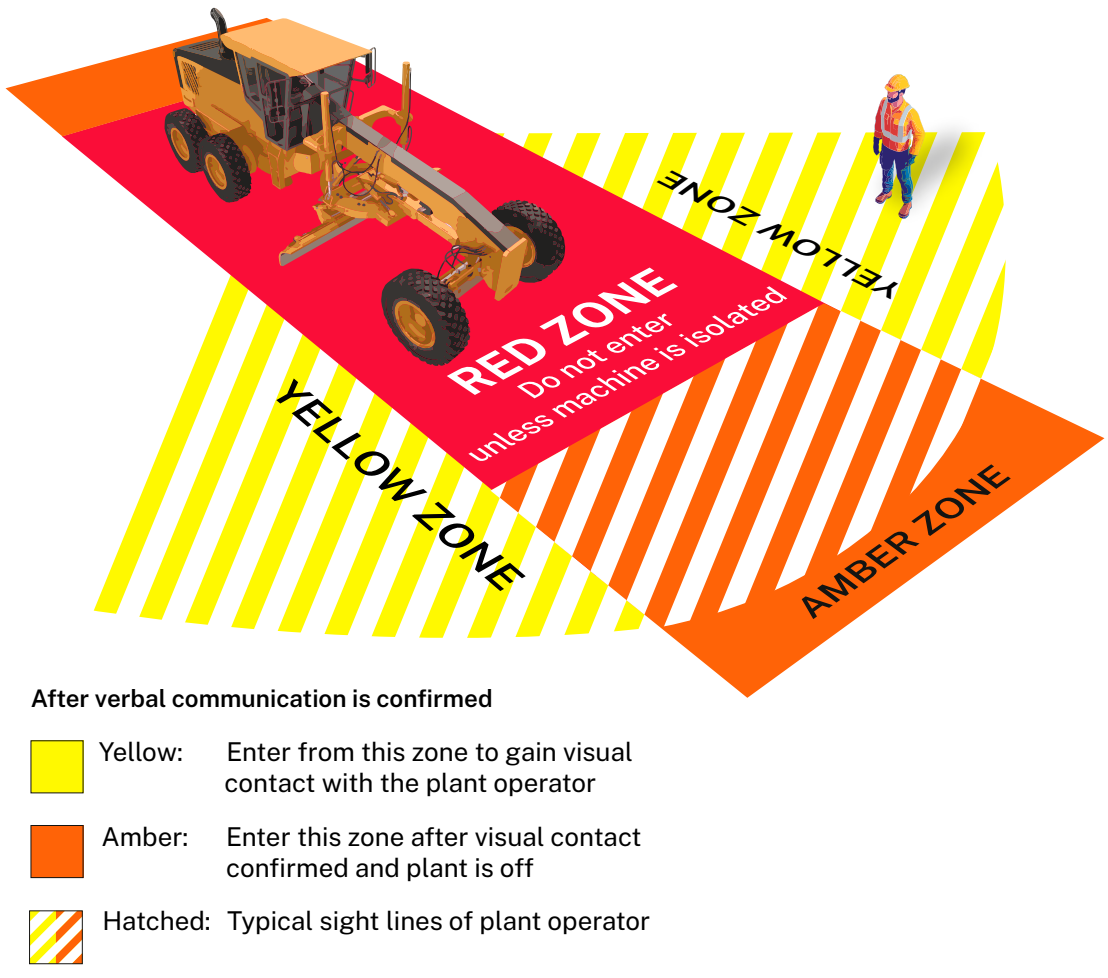

Figure 6: An example of how to approach plant safely following communication.

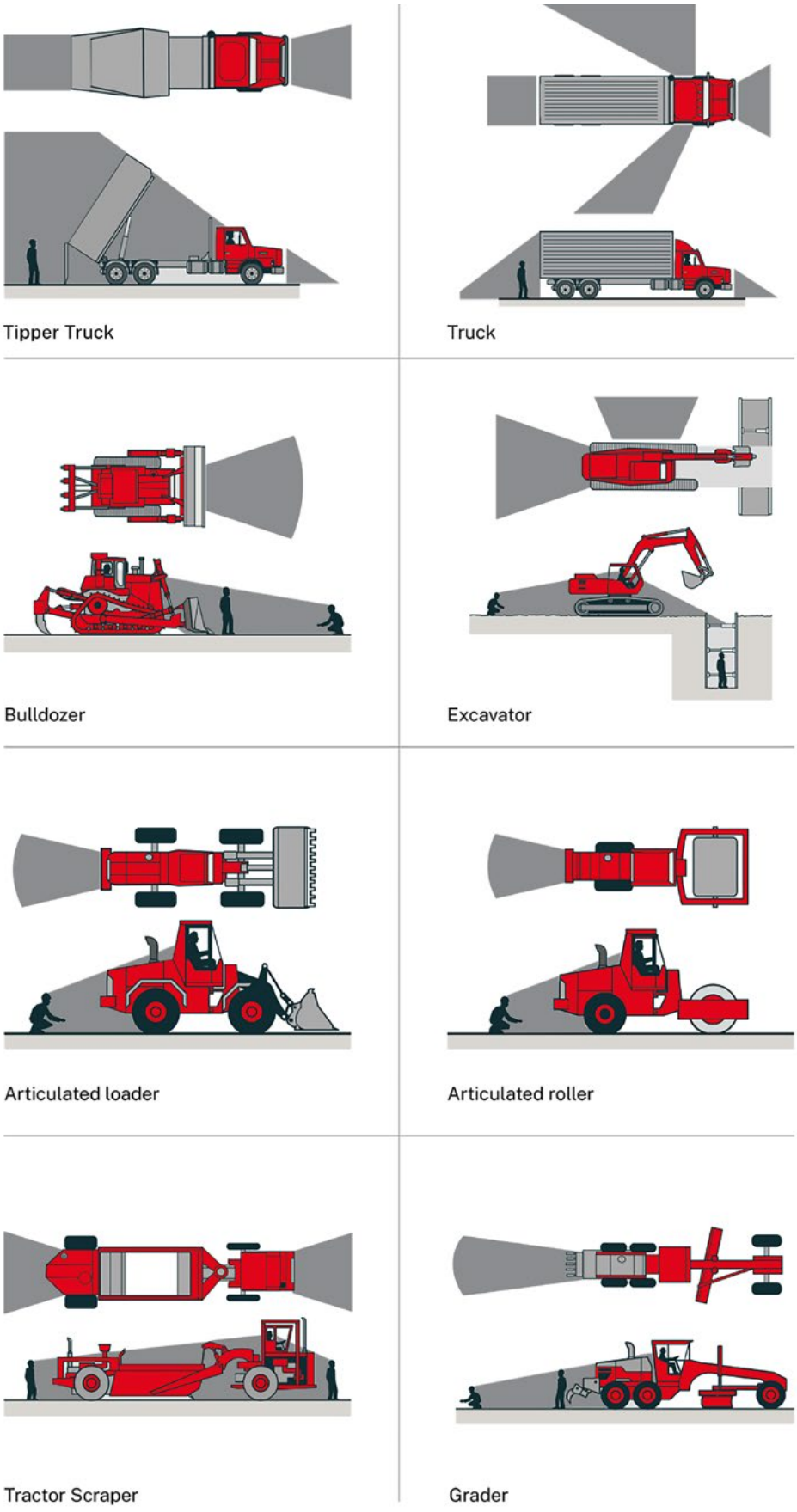

Figure 7: Plant blind spots

6.22 Shifting and sticking loads

Shifting loads and loads sticking in trays, trailers, and buckets are known contributing factors to plant roll over incidents. Shifting and sticking frequently contribute to incidents during unloading or when negotiating turns and slopes. All loose materials may shift under normal operational conditions. Generally, materials are more likely to clump and stick when wet. PCBUs should give consideration to materials that may be wet and more likely to stick and implement control measures as required. Materials such as wet clays are more likely to stick.

6.23 Site entry and exits

Site entry and exit for moving plant and workers on foot should be separated wherever possible.

A separate gate(s) should be provided for workers on foot. The gate should be isolated from moving plant entry areas, adequately signposted, of adequate size to allow persons and tools, and self-closing. The location of gates should provide adequate access to work areas, site offices and amenities.

Sites with a lower volume plant movements (for example a standard class 1 residential construction site) do not require separate access gates, where supported by a risk assessment with the appropriate controls implemented.

As appropriate, a Traffic management plan should be developed by a competent person to control any risks associated with other vehicles and pedestrians while plant is entering and exiting the site.

7. Spotters

So far as is reasonably practicable, PCBUs must eliminate or minimise the requirement for spotters to be in shared zones or the vicinity of moving plant. Spotters are workers that assist plant operators by visually checking that no other person or object is in the intended travel path of the moving plant they are assisting.

Where spotters are a requirement to safely complete moving plant operations or in proximity to overhead electric lines, PCBUs must establish systems of work that ensures:

- spotters are competent in performing spotting duties,
- spotters are consulted and involved in the development, reviews and changes (if required),
- spotters are trained in the function, work tasks, hazardous areas and the complexity of operations involving the moving plant,
- the spotter's location protects them from risks of harm (e.g. impact),
- spotters are in the visual field of the plant operator – where this is not possible, a positive communication method must be in place e.g. two-way radio,
- spotters are not undertaking any other task,
- the spotter maintains a safe distance from the moving plant and is familiar with:
  - the travel speed of the moving plant,
  - operating speed of the moving plant,
  - stopping times (e.g. braking distance) and ground conditions,
  - the tip / roll over distance of the moving plant (for example, the potential side fall distance of a tipper truck with tray raised),
  - the operational environment in which spotting duties will take place,
- where needed, more than one spotter is used for large moving plant or complex operations,
- spotters are authorised to stop work if unsafe conditions arise,
- spotters understand their role and responsibility in responding to an emergency.

Define control measures for spotters in the relevant SWMS. Spotters should be easily identifiable (for example different colour hard hat high-visibility clothing or arm bands etc.).

Figure 8 – The correct place for a spotter to stand. The spotter can see the driver and driver has a clear view of the spotter in the mirror.

Figure 9 – The view the driver should have of the spotter.

Figure 10 – The wrong place for the spotter to stand. The mirror is out of sight of the spotter and driver does not have a clear view of the spotter.

8. Operator and worker competency

Plant operators must have a strong understanding of the operational controls, functions and movements, blind spots created, physical composition, as well as a detailed understanding of how the moving plant interacts with workers on foot and/or other moving plant in delivering the work the plant is to undertake.

PCBUs can determine operator competency in several ways as detailed in this chapter.

8.1 High risk work licences (HRWL)

HRWL apply to prescribed items of plant, as listed in Schedule 3 of the WHS Regulation. HRWL apply regardless of whether the site is residential, commercial or industrial. Furthermore, it applies regardless of the cost or size of the work.

A PCBU must not direct or allow a person to undertake high risk work without a licence (unless training exceptions apply). A worker must not undertake high risk work without a licence (unless training exceptions apply) and must be able to produce the licence for inspection (hard copy or electronic).

With respect to moving plant on construction sites, HRWL commonly apply to cranes, concrete boom pump equipment (and placing equipment), forklifts, and boom type elevated working platforms with capability to reach 11 metres or more. Other licences may apply depending on the nature of the works.

Holding a HRWL provides confirmation that a licence holder has been trained in the functions and risks associated with the item of plant for which the licence applies. However, it does not confirm that the licence holder has specific knowledge of a particular make and model of plant. As such PCBUs should have systems in place to ensure that plant operators are competent regardless of the licence held.

8.2 Verification of competency

Verification of competency is a method of evaluating the skill level of a person against set competency standards. This is to evaluate the person's ability to carry out the relevant activity or works.

Verification of competency can be used as a control measure to ensure the worker is familiar with certain items of plant, the specific controls, operational functions, capabilities, capacities and safe working limits of that plant. It must also confirm that the operator has a working understanding of how the moving plant interacts with workers on foot and/or other plant that is associated with the delivery of the work tasks.

Plant with multiple attachments

Several verifications of competency may be applicable to one item of plant. For example, moving plant with multiple different attachments may require a verification of competency on the specific attachments when fitted to the plant.

Methods of undertaking verification of competency

Verification of competency may be undertaken by the following:

- confirming that a certificate of competency / statement of attainment from a Registered Training Organisation (RTO) or a HRWL is held where applicable,
- confirming that a training certification is held from an industry association or a plant supplier with a specific training program,
- confirming that a worker has undertaken a verification of competency assessment against defined standards,

- PCBU training and assessment undertaken by a competent person (e.g. observing the operator).

PCBUs should give consideration to language, literacy and communication barriers of workers when training and assessing competency.

The currency of the training and any gap in experience, ongoing refresher training is relevant to assessing if the competency is still relevant.

8.3 Re-verification of competency

Re-verification of competency should occur following instances of unsafe operation or a change in plant, process or operating environment.

Unsafe operation

Following any instance of unsafe operation (for example a near miss, a dangerous occurrence, or a significant breach of site rules) involving moving plant, a PCBU should determine the root cause and contributing factors. Where applicable, consideration should be given to the following:

- having the mobile plant inspected by a competent person to determine if any necessary repairs and testing may be required to ensure that the item of plant is safe to put back into service,
- having the mobile plant operator retrained through an RTO or an appropriate verification of competency process,
- revising safe operational procedures, SWMS, etc.

Change in plant or process

Where new plant is introduced or there is a significant change in process, consideration should be given to whether the existing verification of competency applies. Where significant changes have occurred, further verification of competence should be undertaken.

8.4 Competency of workers on foot

In addition to verifying the competency of operators, PCBUs should also have systems to verify the competency of workers on foot that complete work on sites that involve the use of moving plant. Systems to verify the competency of workers on foot include:

- a detailed site induction, complete with information confirming:
  - the types of moving plant, their basic functionality, their blind spots, and run down times,
  - the controls used on the site including any Plant only zones, Plant operating and restricted personnel zones, and Plant hazardous zones,
  - relevant site rules,
  - the requirements for spotting moving plant,
  - systems of supervision and actions taken if site rules are not complied with,
- SWMS detailing work methods applying to both operators and workers on foot that detail the control measures to be implemented,
- specific training for anyone completing spotting duties or working in the hazardous zone of any mobile plant.

9. Additional considerations

Operating moving plant in certain conditions and work environments may present additional hazards to workers and plant operators. The following hazards must be considered to ensure suitable controls are identified to protect workers from harm.

9.1 Respirable crystalline silica (RCS)

RCS presents a significant risk to all construction workers. Natural stone and building products may contain crystalline silica. From the 1st of September 2024, PCBUs processing a crystalline silica substance (substances containing more than 1% crystalline silica) must complete an assessment to determine if the work is a high risk crystalline silica process. If the work is high risk, PCBUs will need to prepare a Silica Risk Control Plan or SWMS. PCBUs must provide training to workers about the health risks and control measures to be used. Common controls include:

- extraction (e.g. vacuum with HEPA filters, scrubbers, etc.),
- wet processes and/or water suppression,
- positive air pressure in plant with cabins,
- PPE and respiratory protective equipment (RPE),
- dust cleaning procedures (avoid dry sweeping and use of compressed air where possible).

Air monitoring is required if you are uncertain on reasonable grounds whether or not the airborne concentration of RCS at the workplace exceeds the workplace exposure standard for RCS, or monitoring is necessary to determine whether there is a risk to health from RCS at the workplace. Health monitoring is required for workers where there is a significant risk to their health from exposure to RCS.

For current requirements and information on how to work safety with products containing crystalline silica, refer to the relevant information on the SafeWork NSW website.

9.2 Asbestos

Asbestos can be found in manufactured building materials and naturally occurring in the ground. Asbestos can be either classified as friable and non-friable and requires removal by a licenced / competent person.

Exposure to asbestos is through inhalation of airborne respirable fibres created when asbestos is disturbed. This can occur from cutting, sanding, drilling, excavating, breaking of the material or other activities that create airborne respirable fibres. PCBUs must manage the risks associated with asbestos. Common controls include:

- remediation of site / work area prior to productive works,
- wet processes and/or water suppression,
- PPE and RPE,
- use of licensed contractors and licensed asbestos assessors,
- airborne fibre monitoring where recommended.

For guidance on working safely with asbestos refer to the *Code of practice: How to manage and control asbestos in the workplace* and *Code of practice: How to safely remove asbestos*.

9.3 Hazardous chemicals

A hazardous chemical is a chemical whether a solid, liquid or gas, that may cause harm to workers health or safety. Hazardous chemicals may cause immediate and/or long-term health effects.

Exposure to hazardous chemicals may occur during the operation or maintenance of mobile plant, such as through the use of fuels, oils, paints and cleaning agents.

PCBUs must make Safety Data Sheets (SDS) available to workers on-site for any hazardous chemicals being used. Refer to the SDS to identify the health and safety risks and appropriate controls in reducing the exposure to workers.

For guidance on working safely with hazardous chemicals, including correct labelling under the Globally Harmonized System (GHS), refer to the *Code of practice: Managing risks of hazardous chemicals in the workplace*.

9.4 Airborne contaminants

Airborne contaminants may be classified as dusts, fibres, fumes, mists, vapours, gases, or biological agents. The PCBU must ensure that workers are not exposed to airborne contaminants above the workplace exposure standard for the contaminant. Where it is uncertain of level of exposure, the PCBU must undertake air monitoring, by engaging a competent person such as an occupational hygienist, to assess the exposure risks.

Operators and other workers can be exposed to airborne contaminants due to mobile plant creating airborne dust (e.g. crushing or cutting sandstone) and diesel exhaust emissions. Where contaminants cannot be eliminated, minimise the risk by applying the Hierarchy of control.

For further guidance refer to the *Code of practice: Managing risks of hazardous chemicals in the workplace*. Chemicals with workplace exposure standards are listed in the *Workplace Exposure Standards for Airborne Contaminants*. Guidance on interpreting exposure standards is available in Safe Work Australia's *Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants*.

9.5 Aboveground and underground services

PCBUs must establish systems to make sure that no person, plant, or thing comes within an unsafe distance of any aboveground or underground service. Where plant or persons are required to work in proximity of these services:

- a risk assessment must be undertaken for the work identifying the potential hazards,
- appropriate control measures must be implemented that are consistent with the risk assessment,
- follow any requirements of the electricity network operator responsible for the electric line.

For information regarding appropriate approach distances from overhead electric lines refer to *Code of practice: Work near overhead and underground electric lines*.

Underground services

Before directing or allowing work to start, a person with management or control of the workplace must take all reasonable steps to obtain current information about underground essential services in the areas at the workplace where the excavation work is to be carried out. They must also obtain information about underground essential services in areas adjacent to the site of excavation and apply appropriate measures.

Underground essential services can be located using underground locators, for example electromagnetic cable locators and ground penetrating radar.

If excavating in a public place the PCBU must take all reasonable steps to identify all electrical cables present. Information should also be obtained by contacting Before You Dig Australia.

In some cases, customers of electricity supply authorities have authority to place electricity cables in public places. If excavating on private property, contact the owner or occupier of the premises about buried cables before starting work.

10. Documented systems supporting safe use of moving plant

Documented systems help to ensure assessments, planning, training, and delivery processes are effective. They also facilitate site checks / audits to verify controls are in place and functioning as intended. There is a requirement under the WHS legislation to provide a WHS management plan and SWMS for any task that sees workers exposed to risk of injury from powered mobile plant.

Whilst not specifically required in WHS legislation, other documented systems such as a Vehicle management plan, moving plant risk assessments, written site rules and documented systems to support supervisors manage moving plant are recommended as the complexity of sites increases.

Where multiple documented systems are operating across the site they should be developed and reviewed holistically to ensure that there is consistency in application.

Note: Traffic Management Plans may be required under other legislation for works on or within proximity to public roadways. Formal rail safety plans may be required for rail projects. Other applications and approvals may be required for the movement of large plant on public roads.

10.1 WHS management plan

The Principal contractor for a construction project must prepare a written WHS management plan for the workplace before work on the project commences.

Refer to section 4.1 for details of what a WHS management plan must include.

10.2 Safe Work Method Statement (SWMS)

A SWMS is required for high risk construction work. Work in an area with movement of mobile plant is high risk construction work. This includes both PCBUs providing the plant and any other PCBU who has a worker in a moving plant area.

The primary purpose of a SWMS is to help PCBUs, supervisors and workers implement and monitor the control measures established at the workplace to ensure high risk construction work is carried out safely. The SWMS must:

- identify the type of high risk construction work being done,
- specify the health and safety hazards relating to the high risk construction work and risks arising from those hazards,
- describe how the risks relating to the high risk construction work will be controlled,
- describe how the control measures will be implemented, monitored, and reviewed,
- be developed in consultation with workers and their representatives who are carrying out the high risk construction work,
- be kept and available for inspection until the high risk construction work to which the SWMS relates is complete,
- be specific to the site where the high risk construction work is being done,
- be kept for at least two years if a notifiable incident occurs from the date of the notifiable incident.

10.3 Vehicle management plan

A Vehicle management plan details how moving plant and vehicles will move on the construction site. For example, it outlines how to manage interactions between light and heavy vehicles, plant and pedestrians. The goal is to eliminate, minimise, or manage the risks of collision or persons being struck.

Vehicle management plans apply within the site. They must be prepared and amended by a competent person as often as necessary to afford safe movement and interactions as the project progresses and changes.

Vehicle management plans should indicate traffic routes, restricted parking, visitor parking, headroom, speed limits, key site areas (office, amenity areas etc.) and route hazards. Vehicle management plans should include the use of standard road signs (speed limits, speed calming devices, stops signs, etc.) where possible.

Vehicle management plans should consider:

- sign posting,
- speed limits,
- barricades, fencing, boom gates, etc.,
- lighting arrangements,
- restricted access areas,
- blind spots,
- vehicle lay-up and parking areas,
- loading and unloading areas,
- one-way roads,
- separation of vehicles and pedestrians,
- wet weather implications,
- vehicle requirements (such as flagging, alarms and lights),
- storage areas for equipment, attachments and materials,
- communication methods (radio etc.).

10.4 Plant risk assessments

Plant risk assessments should be undertaken before the plant is taken to site. The risk assessments should consider hazards, risks and controls relevant to the intended works. The assessment may include:

- delivery / transporting plant,
- set up / commissioning requirements,
- operation,
- the interaction of plant required for a specific work activity,
- the operational environment,
- maintenance and servicing.

A plant risk assessment is usually undertaken by a Principal contractor in collaboration with the subcontractor in control of the item of plant.

Measures must be in place to ensure that the controls identified in the plant risk assessment are addressed and implemented on-site.

10.5 Site rules

Site rules are a set of requirements that must be followed by workers. They should cover major safety issues, where it can reasonably be expected, that failure to follow may place workers at immediate risk of injury. Documented site rules provide clear expectations for site workers / personnel, operators of moving plant, and supervisors in performing their duties. Site rules should be clear, form part of inductions (or other training) and be enforced by supervisors. Site rules should form a part of a PCBUs overall management of the site, and the risks presented by moving plant.

10.6 Systems supporting supervisors

A supervisor is anyone who instructs and directs workers as they carry out their work tasks. A supervisor might be the owner, manager, superintendent, foreperson, department head or trainer. A supervisor may also be someone who unofficially supervises less experienced workers. A supervisor should be experienced in the work task required and deemed competent by a PCBU to provide the functions of a supervisor.

Supervisors as safety advocates

A supervisor is well-placed to be a safety advocate. An effective supervisor is intentional and purposeful in promoting health and safety. They should perform regular safety activities, such as inspections, observations, investigations, and toolbox talks.

Safety actions for supervisors

Some routine safety-related actions supervisors can do include:

- inducting workers to the business and site,
- guiding workers as they do new tasks,
- making sure workers performance meet safety expectations,
- correcting unsafe work activities and conditions,
- identifying new hazards and working to minimise the risk.

Systems supporting supervisors

PCBUs must establish systems to ensure that operators use moving plant safely and workers on foot are safe around moving plant. These systems can include near miss incident investigations, discussions, toolbox talks, formal reinduction, or similar, where actions present high risk.

Any action should include a review to ensure that the systems used by the PCBU are applicable to the circumstance, achievable in the real operational environment, were known to the worker, and did not otherwise encourage or facilitate unsafe actions or behaviours.

11. Incident notification

Part 3 of the WHS Act

WHS Act section 35

What is a "notifiable incident"

WHS Act section 38

Duty to notify of notifiable incidents

A 'notifiable incident' is:

- the death of a person,
- a 'serious injury or illness', or
- a 'dangerous incident' that exposes someone to a serious risk (even if no one is injured)

arising out of the conduct of a business or undertaking at a workplace.

'Notifiable incidents' may relate to any person — whether an employee, contractor or member of the public.

A PCBU must ensure that SafeWork NSW is notified immediately after becoming aware that a notifiable incident has occurred. Notifications can be made by contacting SafeWork NSW on 13 10 50 or via the SafeWork NSW website: *Notify SafeWork*.

When a PCBU is made aware that a notifiable incident has occurred, the PCBU must:

- report it to SafeWork NSW immediately, and
- preserve the incident site so far as is reasonably practicable until an inspector arrives or directs otherwise. This doesn't prevent help being provided to an injured person, removing a deceased person, making the site safe to minimise the risk of a further notifiable incident, or to facilitate a police investigation.

Incidents involving multiple businesses or undertakings

If a 'notifiable incident' arises out of more than one business or undertaking then each must ensure that the incident has been notified to SafeWork NSW.

There is no need for all duty holders to notify — only one needs to. However, all duty holders retain their responsibility to ensure SafeWork NSW is notified, regardless of any agreement between them.

In these circumstances the duty holders must, so far as is reasonably practicable, consult, cooperate and coordinate to put appropriate reporting and notification arrangements in place.

Examples of these incidents are available in Safe Work Australia's *Incident notification fact sheet*.

Enforcement action may be taken and penalties may be applied for not notifying notifiable incidents to SafeWork NSW. For more information see the SafeWork NSW website.

12. Appendices

12.1 Appendix A - Glossary

Terms used throughout this Code that require definitions or descriptions.

Term	Description
Alter (in relation to plant)	To change the design of, add to, or take away from the plant if the change may affect health or safety. Routine maintenance, repair, or replacement is not considered an alteration.
Commissioning of plant	Performing the necessary adjustments, tests, and inspections to ensure the plant is in full working order to specified requirements before the plant is used. This includes recommissioning.
Competent person	A person who has acquired through training, qualification or experience the knowledge and skills to carry out the task.
Construction project	A project that involves construction work where the cost of the construction work is $250,000 or more.
Construction work	Any work carried out in connection with the construction, alteration, conversion, fitting-out, commissioning, renovation, repair, maintenance, refurbishment, demolition, decommissioning, or dismantling of a structure.
Control measure	A measure to eliminate or minimise the risk.
Crane	An appliance intended for raising or lowering a load and moving it horizontally. It includes the supporting structure and foundations but excludes industrial lift trucks, earthmoving machinery, amusement devices, tractors, industrial robots, conveyors, building maintenance equipment, suspended scaffolds, or lifts.

Term	Description
Dangerous incident	An incident in relation to a workplace that exposes a worker or any other person to a serious risk to a person's health or safety emanating from an immediate or imminent exposure to — (a) an uncontrolled escape, spillage or leakage of a substance, or (b) an uncontrolled implosion, explosion or fire, or (c) an uncontrolled escape of gas or steam, or (d) dan uncontrolled escape of a pressurised substance, or (e) electric shock, or (f) the fall or release from a height of any plant, substance or thing, or (g) the collapse, overturning, failure or malfunction of, or damage to, any plant that is required to be authorised for use in accordance with the regulations, or (h) the collapse or partial collapse of a structure, or (i) the collapse or failure of an excavation or of any shoring supporting an excavation, or (j) the inrush of water, mud or gas in workings, in an underground excavation or tunnel, or (k) the interruption of the main system of ventilation in an underground excavation or tunnel, or (l) any other event prescribed by the regulations, but does not include an incident of a prescribed kind.
Duty holder	Any person who owes a work health and safety duty under the WHS Act including a PCBU, a designer, manufacturer, importer, supplier, installer of products or plant used at work (upstream duty holder), officer or a worker.
Earthmoving machinery	Operator-controlled powered mobile plant used for excavating, loading, transporting, compacting, or spreading earth, overburden, rubble, spoil, aggregate, or similar material. Excludes tractors or industrial lift trucks.
Fault	A break or defect that may cause a plant to present an increased risk to health and safety. In the case of a fault in the design of a plant, it refers to an aspect of the design that may cause the plant to be a risk to health and safety if manufactured according to the design specifications.
Hazard	A situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence at the workplace.
Health and safety committee	A consultative body established under the WHS Act. The committee's functions include facilitating cooperation between workers and the PCBU to ensure workers' health and safety at work, and assisting to develop work health and safety standards, rules and procedures for the workplace.

Term	Description
Health and safety representative	A worker who has been elected by their work group under the WHS Act to represent them on health and safety matters.
High risk construction work	Construction work that — (a) involves a risk of a person falling more than 2 metres, or (b) is carried out on a telecommunication tower, or (c) involves demolition of an element of a structure that is load-bearing or otherwise related to the physical integrity of the structure, or (d) involves, or is likely to involve, the disturbance of asbestos, or (e) involves structural alterations or repairs that require temporary support to prevent collapse, or (f) is carried out in or near a confined space, or (g) is carried out in or near — i. a shaft or trench with an excavated depth greater than 1.5 metres, or ii. a tunnel, or (h) involves the use of explosives, or (i) is carried out on or near pressurised gas distribution mains or piping, or (j) is carried out on or near chemical, fuel or refrigerant lines, or (k) is carried out on or near energised electrical installations or services, or (l) is carried out in an area that may have a contaminated or flammable atmosphere, or (m) involves tilt-up or precast concrete, or (n) is carried out on, in or adjacent to a road, railway, shipping lane or other traffic corridor that is in use by traffic other than pedestrians, or (o) is carried out in an area at a workplace in which there is any movement of powered mobile plant, or (p) is carried out in an area in which there are artificial extremes of temperature, or (q) is carried out in or near water or other liquid that involves a risk of drowning, or (r) involves diving work
High risk work licence (HRWL)	Any of the licences listed in Schedule 3 of the WHS Regulation.
May	‘May’ indicates an optional course of action.

Term	Description
Moving plant	Includes plant that: (a) moves either under its own power or is pulled or pushed by another moving plant, (b) moves on or around the construction site enters or leaves the site, or moves past the site, (c) includes road vehicles. *Note:* this definition has been adopted for the purposes of this Code. This includes items such as earthmoving machinery and trucks. It includes all powered mobile plant.
Must	'Must' indicates a legal requirement exists that must be complied with.
Officer	An officer under the WHS Act is: — an officer under section 9 of the *Corporations Act 2001* (Cth) — an officer of the Crown within the meaning of section 247 of the WHS Act, and — an officer of a public authority within the meaning of section 252 of the WHS Act An elected member of a local authority while acting in that capacity, is not an 'officer'. A partner in a partnership is also not an officer, as each partner would be considered to be a PCBU.
Operate	To work from or with plant or to otherwise use the plant.
Operator(s)	The person(s) that is in control of the moving plant. "In control" can includes direct control from the moving plant, control via a pendant, remote control from site, and remote control from a distance.
Pedestrian	A member of the public (non-construction personnel) walking, jogging, etc. In the context of this code, pedestrian safety is usually relevant at interface points with the construction site, for example, at vehicle entry and exit points from the site.

Term	Description
Person conducting a business or undertaking (PCBU))	A PCBU is an umbrella concept which intends to capture all types of working arrangements or relationships. A PCBU includes a: — company — unincorporated body or association — sole trader or self-employed person. Individuals who are in a partnership that is conducting a business will individually and collectively be a PCBU. A volunteer association (defined under the WHS Act) or elected members of a local authority will not be a PCBU. *Note –* A person may be both a PCBU, within the meaning of section 5 of the WHS Act, and a worker within the meaning of section 7 of the WHS Act.
Personal Protective Equipment (PPE)	Anything used or worn by a person to minimise risk to the person's health and safety, including air supplied respiratory equipment.
Plant	Includes — (a) any machinery, equipment, appliance, container, implement and tool, and (b) any component of any of those things, and (c) anything fitted or connected to any of those things.
Powered mobile plant	Plant that is provided with some form of self-propulsion that is ordinarily under the direct control of an operator.
Principal contractor	A PCBU that commissions a construction project is the Principal contractor for the project, unless: (a) the person referred to above engages another PCBU as Principal contractor for the construction project. They also authorise the person to have management or control of the workplace and to discharge the duties of a Principal contractor. The person so engaged is the Principal contractor for the project. (b) they are the owner of a residential premises who directly or indirectly engages a PCBU. This can be for a construction project in relation to the premises. The person so engaged is the Principal contractor for the project if the person has management or control of the workplace. A construction project has only one Principal contractor at any specific time.

Term	Description
Psychosocial hazard	A psychosocial hazard is a hazard that — (a) arises from, or relates to — i. the design or management of work, or ii. a work environment, or iii. plant at a workplace, or iv. workplace interactions or behaviours, and (b) may cause psychological harm, whether or not it may also cause physical harm.
Psychosocial risk	A risk to the health or safety of a worker or other person arising from a psychosocial hazard.
Repair	Restoring the plant to an operating condition, but does not include routine maintenance, replacement, or alteration.
Risk	The possibility harm (death, injury or illness) might occur when exposed to a hazard.
Safe Work Method Statement (SWMS)	A written statement that: • describes how work is to be carried • identifies the work activities assessed as having safety risks • identifies the safety risks • describes the control measures that will be applied to the work activities. It must include: (a) a description of the equipment used in the work, (b) the standards or codes to be complied with, (c) the qualifications of the personnel doing the work, and (d) the training required to do the work.

Term	Description
Serious injury or illness	An injury or illness requiring the person to have – (a) immediate treatment as an in-patient in a hospital, or (b) immediate treatment for — i. the amputation of any part of his or her body, or ii. a serious head injury, or iii. a serious eye injury, or iv. a serious burn, or v. the separation of his or her skin from an underlying tissue (such as degloving or scalping), or vi. a spinal injury, or vii. the loss of a bodily function, or viii. serious lacerations, or (c) medical treatment within 48 hours of exposure to a substance, and includes any other injury or illness prescribed by the regulations but does not include an illness or injury of a prescribed kind.
Should	'Should' indicates a recommended course of action.
Site environment	The conditions, both natural and human-made of the site, including physical, environmental, and logistical factors.
Subcontractor	The person carrying out the work for the Principal contractor.
Volunteer association	A group of volunteers working together for one or more community purposes where none of the volunteers, whether alone or jointly with any other volunteers, employs any person to carry out work for the volunteer association.
Work group	A group of workers established to facilitate the representation of workers by one or more health and safety representatives. A work group may be all workers at a workplace but it may also be appropriate to split a workplace into multiple work groups where workers share similar work conditions or are exposed to similar risks and hazards. For example all workers on night shift.
Worker	Any person who carries out work for a PCBU, including work as an employee, contractor or subcontractor (or their employee), self-employed person, outworker, apprentice or trainee, work experience student, employee of a labour hire company placed with a ‹host employer› or a volunteer. *Note —* A person may be both a worker, within the meaning of section 7 of the WHS Act, and a PCBU within the meaning of section 5 of the WHS Act.

Term	Description
Worker on foot	All workers that are not operating an item of moving plant from within or on the moving plant. This includes all workers that are lying prone, kneeling, sitting, standing, walking, jogging, climbing (and all other similar activities). This includes workers that are actively delivering tasks, traversing the site, on a break, or undertaking any other activity on a construction site. This also includes workers entering and exiting the construction site.
Workplace	Any place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work. This may include offices, factories, shops, construction sites, vehicles, ships, aircraft or other mobile structures on land or water.

12.2 Appendix B - Further information on plant maintenance

Pre-operational inspection

A pre-operational inspection should be done prior to the start of each shift and include inspecting and/or testing:

- all relevant items indicated in the operations and/or manufacturer's manual, or attached to a daily check sheet,
- access (e.g. ladders, steps),
- clear visibility from the operator's position (e.g. no dust, mud, broken windscreens),
- operating and emergency controls,
- brakes,
- safety switches and interlocks, including limiting and indicating devices,
- visual inspection of the structure,
- mirrors, vision increasing devices (e.g. reversing cameras) and movement indicators (lights and beepers),
- safe operation instructions are legible.

The results of the inspection should be entered into a logbook or equivalent digital system. All safety-related faults must be reported and corrected before the plant is used. Where significant issues are identified the plant must be taken out of service, appropriately identified as out of service, and have suitable means to prevent use (e.g. key removed and secured).

Routine maintenance

All plant must be inspected and maintained by a competent person at intervals specified in the maintenance program. The competent person must ensure the maintenance is done to the manufacturer's requirements and the specified items are inspected and/or tested. This includes:

- emergency devices,
- operator controls,
- components associated with lifting (e.g. wire ropes and sheaves),
- interlocks and travel limiting devices,
- access to the machine for operation and maintenance,
- critical components (e.g. brakes, gears, fasteners, pins and shafts),
- track wear,
- areas affected by corrosion, damage, wear or abrasion,
- metal fatigue in critical wear or stress points,
- additional items required for inspection by the manufacturer.

Annual inspection

A competent person must inspect mobile plant, in accordance with the manufacturer's recommendations, if not reasonably practicable, at least annually. The competent person's inspection should review the routine maintenance reports and verify any identified defects and faults have been repaired. To ensure the mobile plant is safe for continued operation, it should be inspected and tested based on the plant's age, usage and known critical

wear areas or components. In the absence of verifiable records of previous maintenance, inspection repairs or modifications, the moving plant must be assessed to its suitability for continued service.

Note: The annual inspection can be done during routine maintenance.

Major inspection

Owners of older moving plant must ensure their equipment is safe for continued service, particularly if critical components of the plant have exceeded their design life. The frequency of assessments for continued service (major inspection) must be based on the manufacturer's recommendations or the requirements of a competent person experienced in the type of plant.

The competent person should inspect high stress areas, critical mechanical and structural components, including visual, selected strip-down and other testing (e.g. non-destructive testing) necessary to make an accurate assessment of the plant condition. The major inspection can be incorporated into the maintenance and inspection program.

The competent person should provide a written report on the details of the inspection for the moving plant owner's records. The report should be signed by the competent person and state the specific mobile plant is safe for continued service and when the next major inspection is required.

Maintenance records

Inspection and maintenance records should match each stage of the maintenance program (pre-operational inspection, routine maintenance, annual inspection, and major inspection) and:

- clearly describe the work undertaken and parts replaced,
- record the date of inspection and maintenance,
- note who did the work and any recommendations for the preventative maintenance program register,
- be signed by the person carrying out the work,
- be kept for the life of the plant,
- be readily available (e.g. hard copy or electronic).

Note: Records should be transferred with ownership of the moving plant.

Additional notes on maintenance programs

Competent person for inspection

A competent person must have the knowledge, skills and the experience necessary to accurately assess the condition of the plant and its components. Different skill sets may be required depending on the inspection criteria or the components being inspected. The competent person could be an independent consultant, the plant manufacturer or a person working for the owner of the moving plant.

Non-destructive testing

Where required, critical components of moving plant should be identified. These critical components should undergo non-destructive testing (NDT). The results of NDT should be kept by the PCBU in the detailed maintenance records.

Repairs

Any repairs made to plant must be done according to the manufacturer's maintenance and repair manuals or detailed instructions from a competent person. All repairs and any replacement of components must, so far as reasonably practicable:

- be carried out by a competent person,
- use original equipment manufacturer (OEM) parts or those that are compatible with OEM and with at least the same specifications,
- be recorded in the service book and detailed in the maintenance records.

Welding

Welding of load bearing components should be done by a suitably qualified welder to Australian / New Zealand Standard *AS/NZS 1554 (Series) Structural steel welding*, and recorded in the service book and detailed in the maintenance records.

Plant modifications

The modifier of the plant may take on legal obligations of a designer, manufacturer and supplier when they alter plant; including doing a risk assessment and providing information to enable other duty holders to fulfil the responsibilities they have in managing the risks associated with the changes.

Modifications to road carrier vehicles need to comply with the requirements of the National Transport Commission. Engineering calculations may need to be done to verify the modifications comply with relevant technical standards and associated strength and operational requirements. Modifications with the potential to affect safe operation of equipment should be approved in writing by the manufacturer or an appropriately qualified engineer. Engineering calculations and approvals should be kept for the life of the equipment.

Disclaimer

This publication may contain information about the regulation and enforcement of work health and safety in NSW. It may include some of your obligations under some of the legislation that SafeWork NSW administers. To ensure you comply with your legal obligations you must refer to the appropriate legislation. Information on the latest laws can be checked by visiting the NSW legislation website www.legislation.nsw.gov.au This publication does not represent a comprehensive statement of the law as it applies to particular problems or to individuals or as a substitute for legal advice. You should seek independent legal advice if you need assistance on the application of the law to your situation.

Catalogue No. SWNSW_39977_b_25

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