SafeWork NSW

Tree works

Code of practice

March 2026

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 Tree works on Friday 27 March 2026. This Code of practice commenced on 27 March 2026. It replaces the 1998 Amenity Tree Industry 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This Code may contain references to relevant withdrawn or superseded Australian Standards or Australian/New Zealand Standards.

Copyright information

Acknowledgment

Safe Work 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.

Contents

Foreword

This Code of practice (this Code) on how to manage work health and safety risks in tree works 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 tree works. Other approved codes of practice should be referenced for guidance on managing the risk of specific hazards.

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

This Code applies to all types of work and all workplaces covered by the WHS Act where tree work is carried out. This includes all people who work with trees, such as arborists, tree climbers, tree removalists, gardeners, horticulturists, landscapers, firewood contractors, builders and developers.

Tree work activities include removal, pruning, maintenance and transplanting of trees using various items of plant and techniques.

This Code does not apply to persons engaged in commercial forestry, refer to the *Code of practice: Safety in forest harvesting operations*.

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 the 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 are tree works?

Tree works include activities related to the care, maintenance, and removal of trees, shrubs, and related vegetation. It includes tasks like lopping, pruning, trimming, repairing, maintaining, transplanting and removing trees.

Other activities involved in tree works may include tree climbing and site clearing, as well as ground operations such as wood-chipping, stump grinding and root pruning. A range of plant and equipment is used to complete the work activities.

Professionals in this industry, often called arborists or tree workers, assess tree health, plant and maintain trees, and may also advise on tree care.

1.2 Who has health and safety duties?

There are a number of duty holders who have a role in managing risks in tree works, 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 tree works, 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.

Duty holder	Application
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.
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	Must ensure, so far as reasonably practicable, that the fixtures, fittings and plant are without risks to the health and safety of any person.
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 tree works. 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.

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. • Duty holders should exchange information about who is doing what to ensure effective coordination of works and management of risks, this includes: — 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.

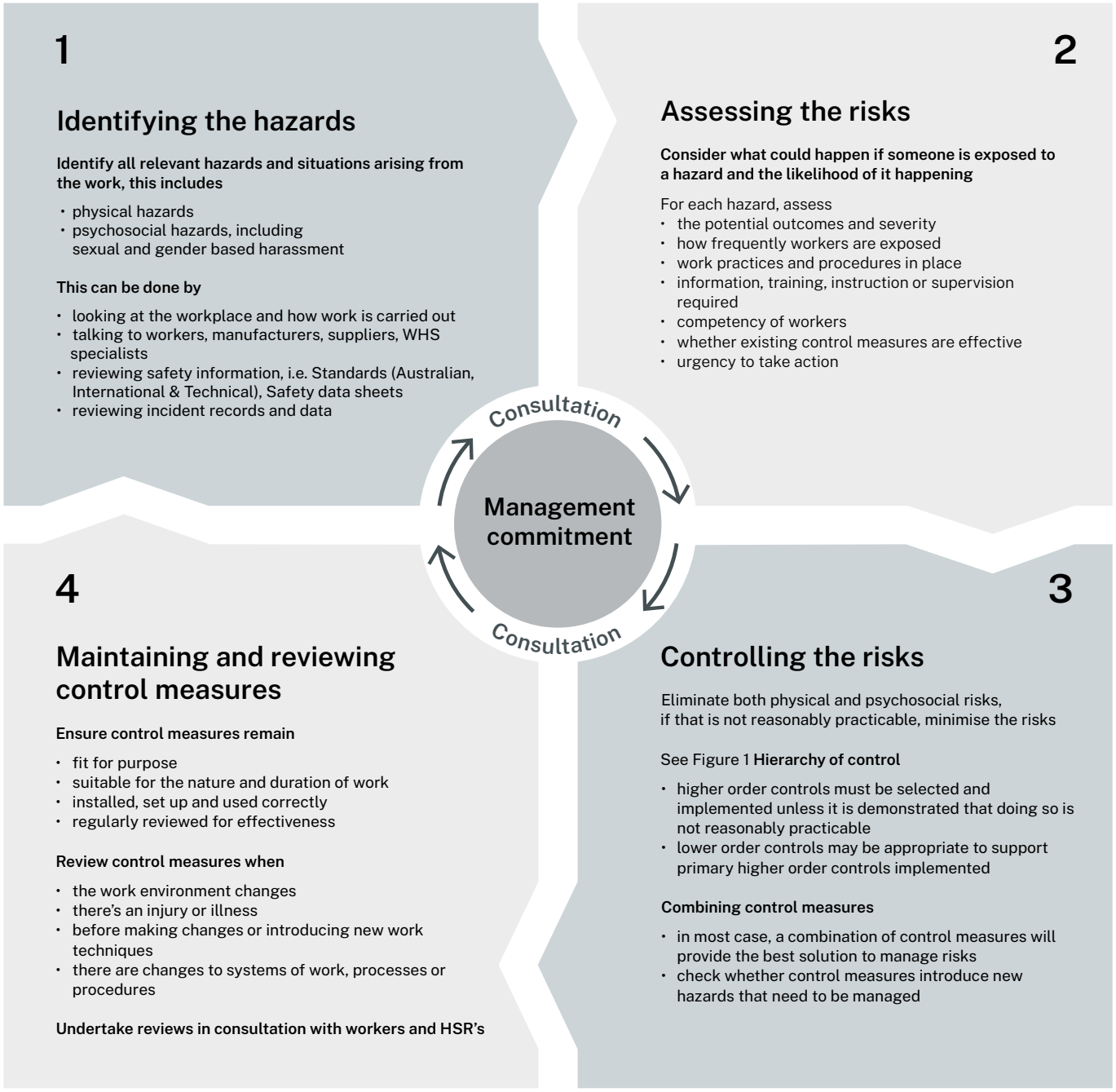
Further guidance on consultation requirements is available in the *Code of practice: Work health and safety consultation, cooperation and coordination*.

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 undertaking tree works. • 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.

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

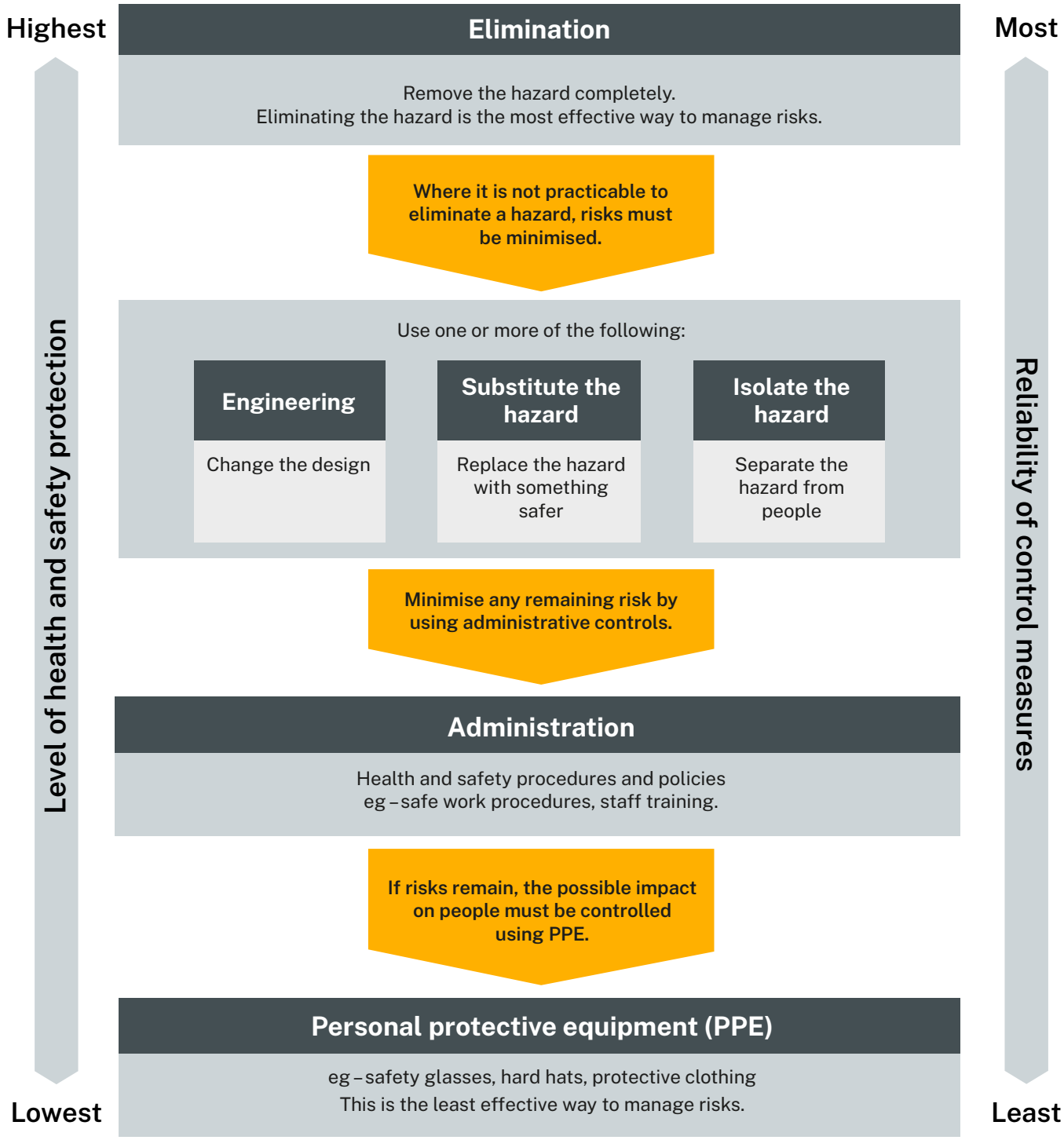


Figure 1: An overview of the hierarchy of control measures

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. Planning and preparation

Planning and preparation for tree work can be affected by various factors, including the condition of the tree/s, weather, terrain, location, the skill and experience of workers and the suitability and condition of equipment.

Planning and preparation is critical to ensure tree work is undertaken safely. Planning includes identifying the hazards, assessing the risks and implementing appropriate control measures to minimise or eliminate the risks.

To assist in planning and preparation, standard operating procedures (SOPs) can provide guidance to ensure safety, efficiency and compliance. They should cover all aspects of tree work operations, including site assessment, hazard identification, equipment inspection, and the use of PPE.

SOPs can also outline protocols for tree pruning, removal, climbing equipment, and the use of plant (e.g. chainsaws and elevating work platforms). Emergency response plans, communication protocols, and traffic management are also integral components. By following SOPs, PCBUs and workers can minimise risks to themselves, the public, and property.

When planning for tree work, PCBUs should consider:

- a visual inspection of the tree/s to determine the scope of work,
- the access methods for the work,
- the weather considerations,
- appropriate exclusion and drop zones for the work location and any public areas,
- selecting the appropriate workers and equipment to complete the work,
- providing a safe system of work, including planning for emergencies and first aid,
- the location of overhead electric lines and underground services (see Chapter 11).

3.1 Inspection and assessment of the tree to scope the works

When planning and preparing for the work and before commencing the work, PCBUs must assess and manage the risks that have a bearing on work activities.

A visual inspection of the tree and an assessment of the tree should be carried out by a competent person. The assessment should give consideration to:

- the tree's overall condition and structural integrity. This is a major risk factor that should be considered by a competent person,
- structural faults like decay, hollows, growth habit and root plate failure,
- wind loading, ground conditions, and the location.

Tree defects such deadwood, decay, bark inclusions, cavities, termite or borer infestation, stump movement, and root damage, affect the tree's stability and structural integrity. Early identification of these defects is an important part of the risk assessment process.

The integrity of a tree is critical to the safety of those working in, under and around it. Workers (climbers) may be required to climb the tree with equipment to undertake the work activity.

The following methods should be used to manage tree defect risks and the safety of workers required to undertake the work activity, following the hierarchy of control measures (from highest to lowest):

- remove or eliminate the defect where possible, e.g. remove hanging branch or deadwood,

- avoid climbing above or beyond the defect or placing climbing or rigging loads on the defective section. Possible solutions include:
    - fell or remove the tree section from below the defect,
    - work from an EWP to avoid loading the tree,
    - independently attach the climber to a separate tree or part of the tree, i.e. descend into the tree from a separate overhanging tree or stable part of the defective tree,
    - the climber should improve the strength of the defect by roping or other engineering solutions, i.e. install restraint straps, bracing or a hand operated wire winch.

Refer to Table 1 for risk factors to consider during the tree assessment and visual inspection.

Table 1: Assessment and visual inspection factors

Assessment and visual inspection factors	Risk factor considerations
Tree species	• Potential for branch splitting, e.g. willows, coral trees and poplars may fail easily. • Trees that may be harmful to a person's health.
Health of the tree	• Dead and decayed trees are unstable. • Unstable roots could cause the tree to fall. • Dead branches unable to support combined weight (e.g. worker and equipment when climbing), could break during climbing. • Dead branches hung in tree.
Condition of the crown and foliage	• Lower foliage may impair visibility and communication between workers. • If the crown is leaning in one direction, consider associated risks such as: — loose or dead branches, vines, creepers, — vines and creepers masking structural defects, — insect colonies, nests, — restricted locations for climber anchor points.
Decay at the base of the tree, trunk or in branch forks	• Tree may split or collapse when climbed or under the combined weight of the worker and equipment.
Objects embedded in the tree	• Wire, nails or spikes may be embedded in the trunk or branches which may create a hazard whilst operating a chain saw during pruning or section felling.
Proximity of other trees	• Branches of adjacent trees may cause trimmed branches to become lodged or "hung up" creating additional removal risks.

Assessment and visual inspection factors	Risk factor considerations
Animal or insect activity, or other conditions that could create a skin contact risk for workers	• Spiders and insects such as bull ants, ticks, wasps and bees. A single wasp or bee sting can be fatal in the event of an allergic reaction. Some workers may be particularly susceptible. A tree climber who disturbs a colony or nest may not be able to take immediate evasive action if attacked. • Venomous animals such as snakes and spiders. • Allergies may also occur through contact with plants (for example, grevillea and plane trees). • Wildlife such as possums, koalas and birds may also be present and need to be removed. • River red gum disease, caused by fungus, can cause human disease.
Recent works nearby that could affect the stability of the tree	• Excavation works.

3.2 Access methods

PCBUs must select the work method that eliminates, or if not practicable to do so, controls the risks associated with the task(s) involved in tree work.

It is critical to safety that PCBUs select the most suitable access method for the task.

Some tasks involved in tree work require people to work at heights. These tasks may involve the use of EWPs, cranes and tree climbing techniques. The risks associated with each work method will vary and each will have a different level of risk depending on the task being performed.

There are a number of different methods that can be used to access upper areas of trees to perform pruning or tree lopping work.

Consideration needs to be given to methods for stabilising or securing the tree or limb to ensure safe access and prevent tree collapse as a result of added loads caused by the weight of the climber or equipment associated with the movement of the climber.

Table 2 lists possible access methods and outlines their advantages and limitations.

Table 2: Tree access methods and their advantages / limitations.

Access method	Advantages	Limitations
An elevating work platform (EWP)	• Worker isolated from potential hazards of tree. • Worker attached to EWP. • Worker protected by guard rail of EWP bucket. • Safe access to outer reaches of tree canopy. • Lower worker fatigue. • Ease of rescue.	• Site unsuitable for mobile plant. • Unable to access parts of the tree close to the trunk. • Terrain unsuitable for EWP, e.g. sloping or unstable surface. • Electricity wires between EWP access and tree. • Vehicular and/or pedestrian traffic management constraints. • May not be appropriate for small, simple jobs. • Falling trunks or branches striking the EWP.
Worker placed in tree using a crane	• May allow access to areas not suitable for an EWP. • Worker isolated from potential hazards of tree. • Worker attached to crane hook. • Safe access to outer reaches of tree canopy. • Lower worker fatigue.	• Requires competent person in use of harness. • Requires worker to be in communication with crane operator. • Site unsuitable for mobile plant. • Unable to access parts of the tree close to the trunk. • Terrain unsuitable for crane, e.g. sloping or unstable surface. • Electricity wires between crane and tree. • Vehicular and/or pedestrian traffic management constraints. • Not appropriate for small, simple jobs.
Work positioning system Options include worker / climber with climbing rope and harness or climbing rope, climbing spikes, pole strap and harness	• Suitable where site access is limited. • Allows mobility within the canopy of the tree. • Relatively small equipment and infrastructure requirements. • Allows inspection of tree structure and potential faults as climber ascends tree. • Used in conjunction with crane where climber ascends the tree and attaches lifting gear from within the tree.	• Requires trained climber. • Requires trained rescue person. • Not suitable where structure and/or condition of tree makes climbing unsafe. • Climber fatigue can impair decision making. • Manual handling constraints.

Access method	Advantages	Limitations
Individual fall arrest system	• Suitable for access to trees from surrounding structures where there is a risk of a fall (e.g. roof or cliff edge).	• Not suitable for use within trees. • Locating suitable anchor points.
Portable ladders Both ladder and worker / climber should be connected to the tree in these circumstances	• Allows transit over vines (e.g. ivy) that limit climbing rope access. • Allows access to branches that are otherwise inaccessible to climber.	• Risk associated with initial installation prior to ladders connection to the tree. • User often unstable on ladder. • Movement of branch when cut creates instability for ladder and may cause it to dislodge. • Falling branches may dislodge user or ladder.

3.3 Weather considerations

Tree work is generally performed outdoors where workers are exposed to a range of environmental hazards. PCBUs should consider these hazards as part of the risk assessment for the work activity.

Weather conditions can create hazards when performing tree work.

Common hazards include:

- Wind – strong winds can damage or weaken trees, affect communication, destabilize plant or workers near the tree, and cause branches to sway or fall unexpectedly.
- Wet conditions - the performance of plant and equipment can be altered due to wet conditions increasing the risk of equipment damage, electrical hazards and the stability of the tree.
- Cold – exposure to low temperatures can lead to hypothermia and frostbite to workers in these conditions.
- Heat - Heat-related illnesses such as heat rash, fainting, heat exhaustion, burns, and heat stroke can occur when working in high temperatures.
- Solar UV radiation – Prolonged exposure to solar UV radiation can lead to skin cancer, sunburn, and eye damage. It can also deteriorate equipment over time.
- Lightning - Lightning poses a risk of injury or death, especially during thunderstorms or when working near conductive materials.

During hazardous weather conditions, such as strong winds, lightning activity, extreme heat or torrential rain, work should stop and be rescheduled.

It is important to access a local weather forecast and site information to obtain regular updates to ensure conditions remain safe to continue working.

3.4 Communication methods

Effective and positive worksite communication methods should form part of the risk assessment and be agreed before workers start work. The method of positive communication will depend on the tasks being carried out, the equipment being used, noise implications and the location of workers at the worksite.

Methods for communicating at a worksite include:

- two-way closed loop devices, especially if a worker is elevated in a tree or on a temporary work platform,
- hand signals,
- whistles,
- mobile telephones.

Effective communication systems should make allowances for high noise levels often found on site (e.g. chipper operation and distances between workers). They should ensure that:

- tree climbers are able to communicate with others in the tree and ground workers,
- ground workers are able to alert persons working at heights of any problems that arise.

Mobile phones should not be used as a method of primary communication at locations of work without prior confirmation of network coverage and service at that location.

3.5 Exclusion and drop zones

WHS Regulation section 54

Management of risk of falling objects

WHS Regulation section 55

Minimising risk associated with falling objects

PCBUs must manage risks to health and safety associated with an object (e.g. a tree branch) falling on a person if it is reasonably likely to injure the person, in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation.

If it is not practicable for the risk to be eliminated (by preventing an object from falling freely), the PBCU must minimise the risk by providing adequate protection against the risk and maintaining a safe system of work. This may include providing an exclusion zone that persons are prohibited from entering.

The purpose of exclusion and drop zones is to protect workers, other persons, and property from potential hazards associated with tree work activities.

These zones are designated areas around a worksite where access is restricted due to the risk of falling objects (e.g. branches), equipment operation (e.g. chainsaws) or machinery movement.

Exclusion zones ensure that only trained and competent workers are within proximity to hazardous operations, to minimise the risk of injury or accidents. These zones should be clearly marked and communicated as part of a site-specific risk assessment and are a critical component of safe work practices.

There may be multiple exclusion zones considering:

- pedestrian access and footpaths,
- vehicle access and public roads,
- hazardous operations of plant and equipment.

If tree work activity is to be completed in and on public road reserves, there should be consideration of the development of traffic management plans and local council approvals.

The following diagram shows the exclusion and drop zones.

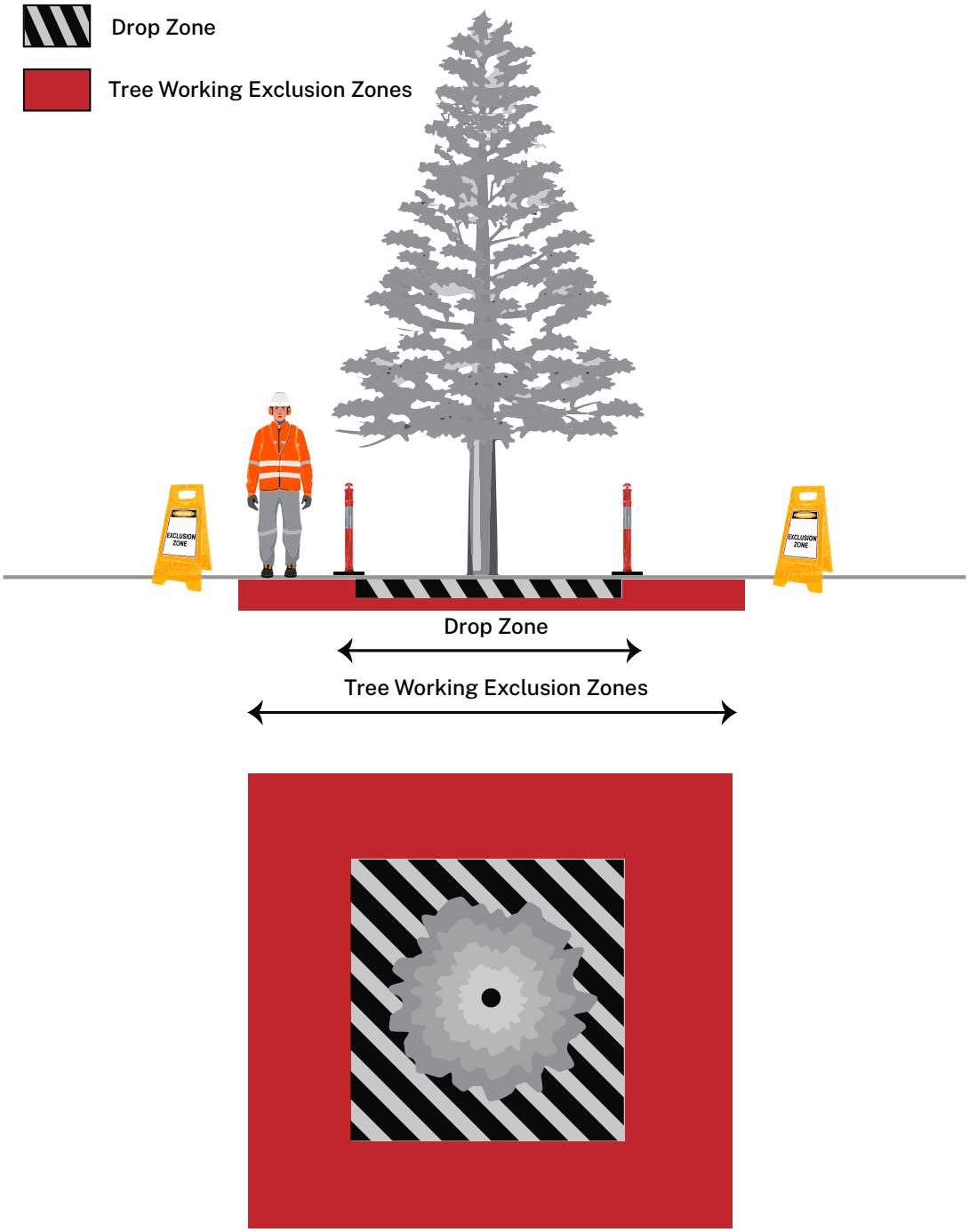


Figure 2: Exclusion and drop zones

Exclusion zone

A large area where other persons who are not workers are excluded from to ensure their safety.

Note: Where houses or other structures that may contain people are located within exclusion zones, steps must be taken to control the associated risks.

Drop zone

A drop zone is an area designated for the entire tree to land when felling, or for tree material, e.g. branches, limbs, or trunk sections, to be deposited after cutting or lopping.

Workers must not enter the drop zone while the tree or tree material is being felled or dropped. If tree material or equipment is being lowered, workers must not enter the drop zone until it is safe to do so.

When establishing a drop zone, to ensure workers are not at risk of being struck, the size and boundaries should be determined through a risk assessment. Factors to consider include:

- the overall size of the work area,
- the length, size and shape of the material being dropped or lowered,
- whether the ground is sloped or uneven, which may cause the tree material to roll, slide or travel beyond the intended zone,
- the potential for tree material to deflect off other branches, the roots of the tree, structures, hard surfaces or equipment,
- providing adequate exclusion distances to account for unexpected movement of falling, flying or rolling material.

3.6 Tree works in public areas

WHS Regulation section 214

Powered mobile plant — general control of risk

WHS Regulation Part 4.9

Traffic control work

When tree work is being undertaken in public areas, PCBUs must manage risks to vehicles and pedestrian traffic. Exclusion zones should be established to keep the public at a safe distance from the work and risks.

Any tree work being undertaken near facilities where people congregate, such as a school or childcare centre, may need to be scheduled at times when the facilities are not attended, or completed between arrival and departure times.

When work is being undertaken on or directly adjacent to a public road, a PCBU must ensure that appropriate traffic control is in place and undertaken by appropriately licenced and competent workers.

The following control measures should be considered to manage traffic around the exclusion zone:

- if a change of traffic direction or speed is required on a public road, then a traffic control plan should be developed and implemented by a competent person,
- plans should be submitted to the controller of the road (e.g. the Transport for NSW or local council),

- two-way radios may be necessary if controllers cannot see each other,
- traffic and pedestrians should be given sufficient warning to alert of the hazards and any change of direction,
- signs and barriers should be used and conform to Australian Standard *AS 1742.3:2019 Manual of uniform traffic control devices*,
- barriers should be used to direct traffic around or past the work site - the position and effectiveness of barriers should be monitored by workers throughout the day to ensure they remain effective and to allow for changes in the location or nature of the work,
- ground workers should ensure they remain alert to ensure pedestrians, children and animals do not enter the exclusion zone.

Figure 3: Tree works in public areas

3.7 Emergency planning and first aid

WHS Regulation section 42

Duty to provide first aid

WHS Regulation section 43

Duty to prepare, maintain and implement emergency plan

A PCBU must ensure an emergency plan is prepared for the work site, this includes:

- providing workers with the information, training and instruction they need to implement the procedures,
- establishing and testing emergency procedures,
- maintaining the emergency plan so that it remains effective.

Emergency plans should also:

- ensure help is provided promptly to any worker who needs it,
- ensure tree workers do not work alone,
- include rescue techniques and the risks of suspension intolerance.

Where workers are working at heights, for example conducting tree climbing or EWP work, a PCBU must ensure a rescue plan is in place in the event of an accident or injury occurring. The rescue plan should include:

- a plan to access where the climber is working in the tree and rescue them to the ground,
- contact details for local emergency services and, if electric lines are present at the site, the direct emergency contact number for the electricity operator,
- having at least one other member of the crew on site trained and competent in the task being completed and holding the applicable national qualification in aerial rescue,
- having dedicated harness-based fall protection rescue equipment:
    - available on the work site and ready for immediate use,
    - kept in a serviceable condition and reserved only for rescue situations,
    - sufficient to carry out a rescue from any situation on the site, so far as is reasonably practicable,
    - providing a method for the rescuer to gain access to the injured climber and descend from the tree in a controlled manner,
    - providing a method for the injured climber to be lifted over a short distance and lowered to the ground in a controlled and safe manner.

Some rescues may be too complex or too hazardous for the rescuer to attempt, for example if suspended loads remain in the tree, or if there are electric lines involved in the incident. A rescuer must not attempt a rescue that is beyond their skill level and must take reasonable care for their own health and safety during the rescue.

PCBUs must ensure:

- workers have access to first aid equipment and facilities, and
- an adequate number of workers are trained to administer first aid or the workers have access to people trained in first aid.

Further information can be found in the *Code of practice: Managing the risk of falls at workplaces* and *Code of practice: First aid in the workplace.*

4. Tree climbing

WHS Regulation section 78

Management of risk of fall

WHS Regulation section 79

Specific requirements to minimise risk of fall

Tree climbing is a hazardous and complex activity that should only be carried out when a visual risk assessment has determined that it is not reasonably practicable to complete the task by other safer means, such as felling the tree from the ground or working from an EWP.

Due to the hazards associated with tree climbing, it should only be carried out by competent workers with the relevant national qualification or workers undergoing training and being directly supervised by a competent person.

PCBUs must manage risks to health and safety associated with tree climbing that is reasonably likely to cause injury to a person, in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation.

PCBUs must minimise the risk of a fall by implementing appropriate controls relevant to each task or situation. Control measures may include:

- a work positioning system, e.g. a rope access system,
- a second attachment point, i.e. the use of a climbing lanyard or a second rope system, when:
    - undertaking cutting work in a tree,
    - there is a risk of an uncontrolled swing, or
    - there is a risk of failure of the main climbing line or primary anchor point,
    - the anchor point is not above the work area.
- setting ropes from the ground prior to tree climbing, as opposed to climbing to the anchor point.

4.1 Equipment considerations

A PCBU with management or control of plant (e.g. climbing equipment) at a workplace, must ensure, so far as is reasonably practicable, that any equipment is without risks to the health and safety of any person (e.g. a worker undertaking tree climbing).

The PCBU and worker who will be climbing (the climber) should ensure that the appropriate equipment is selected before commencing the work and leaving the ground.

Consideration should be given to:

- inspecting, adjusting, and properly fitting all tree climbing equipment and PPE,
- identifying and selecting appropriate anchor points,
- preparing tree climber rescue equipment and a rescue plan,
- ensuring the climbing system includes two methods of attachment if reasonably practicable,
- verifying all connection hardware is properly connected, locked, and oriented correctly,
- ensuring all knots are properly tied, dressed, and pre-loaded before leaving the ground,
- confirming the climbing rope is at least twice the length of the highest intended anchor point.

The climber should thoroughly inspect climbing equipment before and after each use to ensure it is safe, functional, and in good condition. Ensure damaged equipment is removed from service until assessed by a competent person.

When selecting climbing equipment, refer to the relevant Australian/New Zealand Standards for guidance:

- *AS/NZS 1891.1:2020 Personal equipment for work at height – Manufacturing requirements for full body combination and lower body harnesses*
- *AS/NZS 1891.4:2025 Personal equipment for work at height – Selection, use and maintenance*
- *AS/NZS ISO 22846.1:2020 Personal equipment for protection against falls - Rope access systems – Fundamental principles for a system of work*

PCBUs and workers should follow the manufacturer's instruction manual for the correct use, maintenance, and storage of climbing equipment. Modifications should only be made by the manufacturer or according to a specification provided by the manufacturer or a competent person.

4.2 Climbing ropes

When selecting climbing ropes, the following should be considered:

- ropes should be fit for purpose and compatible with equipment,
- ropes should be selected by a competent person,
- ropes are manufactured for industrial use.

Static ropes are only to be used for access, and dynamic ropes are selected for traversing and working within the tree.
Rope made unsafe by damage, defect, wear and tear, or for any other reason should not be used and should be removed from service. Appropriate care should be taken, including storing ropes safely when they are not in use.

4.3 Selecting climbing anchor points

When selecting climbing anchor points, all anchor points must be carefully assessed to ensure they are safe and suitable for the intended work.
General considerations for all anchor points:

- Are there any identified defects or faults in the tree?
- Undertake proof loading and testing prior to climbing, where practicable.
- Ensure anchor points are above the work area or as close as possible to it.
- Do they provide the safest possible working angle and position?
- Are they structurally sound and capable of supporting the force of a fall, two people and possible rescue loads?
- Will they prevent the worker swinging towards or over electrical conductors or any other hazards if they were to slip or fall?
- Are they separated from the roping system, where possible? The roping system should not adversely affect the climbing anchor point in relation to climber and rescuer safety.
- Does the location prevent the crossing or overlapping of climbing and roping ropes? These ropes should never make contact as the resulting friction generated could result in rapid failure of the climbing rope due to heat generated.
- Assess the suitability for life support.

Additional considerations for natural anchor points:

- Has a weight test been completed and do they allow the climbing rope to move freely without constricting the

rope or causing it to jam?

- Junctions should be of sufficient angle or captive as to prevent the climbing rope from walking towards the tip of the branch. A friction saver or anchor sling should be used to reduce friction or the likelihood of the rope walking.
- The integral strength, condition, and species of the tree (e.g. coral, willow and poplar).
- When limited to smaller diameter branch junctions or reduced strength anchor points, climbers should pass the climbing rope or lanyard around the vertical stem or the larger of the two stems.
- Some stems are too small to use as climbing anchor points and climbers should adopt a conservative approach when selecting climbing anchor points.
- If the tree does not have suitable natural anchor points in the desired location, then alternative methods of access or artificial anchor points should be used. This situation may occur in palms and other trees with similar growth habits and structure.

4.4 Harnesses

A work positioning harness comprises an adjustable waist belt connected to a pair of leg loops or a sit strap, designed to support the tree climber in a sitting position while suspended. The harness features side attachment hardware for hands-free work and front attachment hardware for suspended work.

The work positioning harness should be used in conjunction with adjustable lanyards or pole straps and is limited to situations that may result in a restrained fall or a limited free fall. It should not be used if there is a risk of a free fall greater than 600mm. The harness should prevent the wearer from slipping out if inverted; if this cannot be ensured, a full-body harness should be worn instead.

PCBUs and workers should ensure that harnesses are used and maintained according to the manufacturer's recommendations. If the manufacturer's recommendations are not available, harnesses should be maintained as per the guidance of a competent person. Inspections must be carried out at least annually to ensure the harness remains safe and serviceable.

For further guidance refer to Australian/New Zealand Standards:

- *AS/NZS 1891.1:2020: Personal equipment for work at height – Manufacturing requirements for full body combination and lower body harnesses*
- *AS/NZS 1891.4:2025: Personal equipment for work at height – Selection, use and maintenance.*

4.5 Adjustable lanyards

The following points should be considered when selecting, using and maintaining adjustable lanyards:

- wire or wire core lanyards should not be used in an electrical environment,
- the orientation of the connection hardware should not encourage a twisting or roll out situation,
- webbing should be retired if there are any visible cuts,
- lanyards should incorporate a maximum length stop as an integral part of the lanyard,
- ensure faulty, defective or visibly worn / cut rope lanyards are not used and are permanently removed from service.

4.6 Mechanical ascenders, descenders and rope grabs

The following points should be considered when selecting, using and maintaining ascenders, descenders and rope grabs:

- they should be compatible with the rope specifications being used in the system. Special attention should be given to the recommended rope diameters for a given device,
- they should be self-locking or used with another device that is self-locking,
- descent devices should have an automatic braking function. The brake should activate when the operator removes their control hand from the device,
- ensure faulty or defective equipment is not used and is removed from service until repaired and assessed as fit for use,
- when using mechanical ascenders consideration should be given to having a backup (secondary attachment) on the main climbing line in case of mechanical failure of the ascender.

4.7 Prusik loops

Prusik loops and other friction knots should be:

- compatible with the climbing rope,
- formed using fit for purpose rope,
- an appropriate length for the climber and the climbing system being used,
- tested at ground level prior to first use in a tree,
- inspected before and after each use for heat and abrasion damage.

4.8 Climbing spikes

Climbing spikes are sharpened steel spikes attached to a climber's leg, and they are commonly used to ascend trees. Climbing spikes should:

- be used in association with a fall prevention system. This system involves the use of a work positioning harness and adjustable lanyards,
- be designed for tree climbing and adjusted to suit the leg-length of the climber,
- not be worn while moving around on the ground, as they can easily puncture legs and feet,
- only be used if the tree is being removed and not used when undertaking pruning works,
- be fitted, sharpened, stored and maintained as per the manufacturer's specifications,
- be kept clear of loose ropes. Webbing should be kept on the outside of the climber's legs and should remain clear of the climbing spikes,
- be stored to prevent damage to other tree climbing equipment. Cover with guards or store the climbing spikes separately.

4.9 Fall prevention equipment

The following controls should be considered when selecting equipment that will assist in the prevention of falls.

- Climbers should ensure that they always remain attached to the tree, including when changing positions or attachment points.
- Climbers should carry at least two methods of attachment, including a climbing rope at least twice the length of the highest safe anchor point. When operating cutting equipment or where additional stability is required, two points of attachment should be used, preferably from independent anchor points.

- Ensure all attachment points are stable before relying on them.
- When a climbing rope is part of the fall prevention system, keep the rope taut to limit fall distance to 600mm or less.
- Do not use knots that:
    - are insecure if tied incorrectly,
    - require a second knot for security,
    - creep or loosen under load. For example: stopper knot, barrel knot.
- When passing branch junctions or changing attachment points, do not disconnect the existing system until the new system is:
    - checked,
    - preloaded,
    - supporting body weight.
- Avoid rapid descents when using friction systems. Excess heat from descents can damage or cause failure of the climbing system.

4.10 Connection hardware

PCBUs should ensure:

- connection hardware (such as karabiners, snap hooks, tube nut connectors) is fit for purpose and inspected for safe operation before, during and after use,
- any faulty or defective hardware is permanently removed from service,
- the manufacturer's instruction manual is followed when using, maintaining and storing connection hardware.

The following controls for connection hardware should be considered:

- be self-locking (manual or automatic locking gate mechanism) and contain two deliberate actions to prevent inadvertent opening,
- be compatible with the point of attachment to reduce the risks associated with side loading and possible rollout situations,
- be prevented from rotating on the point of attachment where possible (to reduce the risk of side loading or accidental gate opening),
- use karabiners with captive eyes or pins, screw gate connectors are not recommended,
- steel connection hardware should be selected for harsh working conditions or situations where greater abrasion resistance is required.

Semi-permanent connection hardware should be used where disconnection is infrequent. Connectors should be selected and installed to prevent accidental rollout and provide security beyond spring-loaded mechanisms. Connectors should be selected and installed to prevent accidental rollout and provide security beyond spring-loaded mechanisms. Where necessary, connections should be further secured to prevent loosening during use.

5. Elevating work platforms (EWP)

An EWP must only be used to trim or remove a tree if it is not reasonably practicable to carry out the work from the ground or from a solid construction.

The following considerations should be assessed to determine whether the use of an EWP is safe and suitable:

- Can the EWP be made stable with adequate control, stabilisers, or dunnage to maintain stability in operation?
- Can the EWP safely reach the height necessary to trim or remove the tree?
- Does the worker need to lean outside the structure of the EWP?
- Does the tree's structure or the drop zone prohibit the safe use of an EWP?
- Will the EWP impede the cutting or lowering of the limb, branch, or section of tree?
- Can the EWP be set up or positioned to minimise the risk of falling trunks or branches striking the EWP?
- Are there obstacles, structures like buildings and other trees present at the site making EWP access impossible?
- Are there underground services present, for example water, gas, telephone, electricity that may restrict access or locations to set up temporary platforms?
- Do overhead electric lines create a risk for a worker because of the EWP's position?
- Is the ground level, uneven, sloping, firm or loose which could lead to the EWP overturning?

5.1 Selecting the right EWP

PCBUs should ensure the correct type of EWP is selected for the type of work being carried out. When selecting the type of EWP to be used the following should be considered:

- the ground bearing capacity,
- weather conditions,
- access limitations,
- the type of tree work to be done,
- the height and reach required,
- the number of workers required on the EWP,
- the lifting capacity required.

PCBUs should also consider the needs of the workers when selecting an EWP. Where possible, select EWPs with similar operational controls to promote ease of use and reduce confusion. Ensure workers are trained or appropriately licenced where required for the EWP they are operating. This is particularly important in workplaces where multiple EWPs are used as variations in controls can increase the risks to safety.

Types of EWPs commonly used to access trees for work include:

- trailer mounted EWP (see Figure 4),
- self-propelled EWP with telescoping boom including knuckle boom (see Figure 5),
- vehicle mounted EWP (see Figure 6).

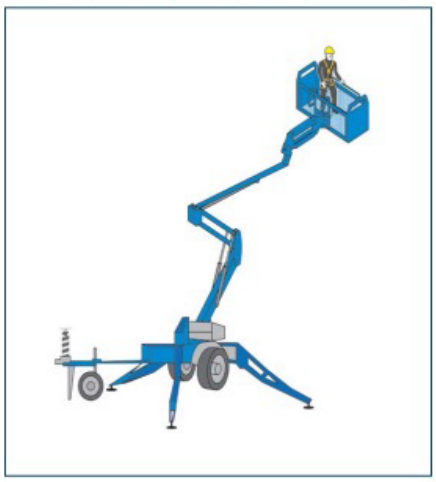


Figure 4: Trailer mounted EWP

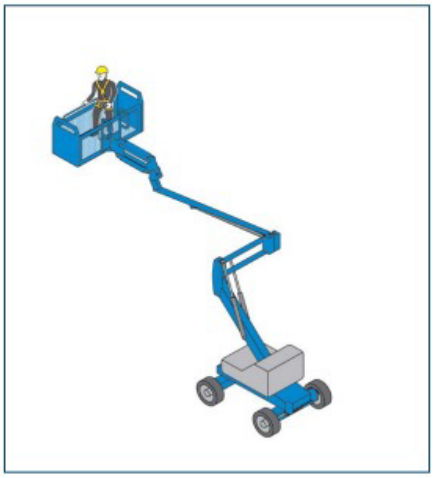


Figure 5: Self-propelled EWP

Figure 6: Vehicle mounted EWP

5.2 Safe use of EWPs

The safe use of EWPs is covered by Australian Standard *AS 2550.10:2025 Cranes, hoists and Winches – Safe use – Mobile elevating work platforms*.

Some of the hazards associated with EWPs can include:

- overhead electric lines,
- underground services,
- roadways,
- traffic,
- sloping and soft or unstable ground.

The following should be considered when using an EWP.

- Where the boom length of the EWP is under 11 metres the operator must receive information, training and instruction to operate the EWP.
- Where the boom length of the EWP is 11 metres or more, operators must hold a high risk work licence (refer to Chapter 10.3 for further information).
- A copy of the instruction manual should be kept in every EWP. Operators should have read the manual and be familiar with it before operating the EWP.
- The EWP should have a logbook that details the daily, monthly and annual maintenance of the unit. Operators should check the logbook and complete it on a daily basis.
- Correct tyre pressure is critical for stability of EWPs when outriggers are not being used. If outriggers are required for stability, they should be engaged before operating the boom.
- The rated capacity of the bucket or platform must not be exceeded. The rated capacity includes the weight of the operator, tools and any branches or other debris.
- Fuel should not be carried on the platform or in the bucket of an EWP.
- When working on or above roads, appropriate traffic management steps should be implemented.
- Persons are not to be suspended from an EWP.

For boom-type EWPs the following additional precautions should be observed.

- A competent operator should be in the bucket when it is being operated. The EWP should be operated from the bucket, and the lower vehicle mounted controls only used in an emergency.
- A nominated ground worker should be trained in the operation of the lower vehicle mounted controls to lower the bucket in an emergency.
- Every person in the bucket should wear an appropriate fall-arrest harness that complies with Australian/New Zealand Standard *AS/NZS 1891.4:2025: Personal equipment for work at height – Selection, use and maintenance* and be attached to an anchor point in the bucket.

Scissor lifts

Scissor lifts are another common type of EWP. However, their use in tree work is limited because they have a greater risk than a boom-type EWP of being struck or knocked over by falling branches or trunks, due to their supporting structure being directly underneath the working platform. Their use is restricted to flat and firm unsealed surfaces. Scissor lift-type EWPs should not be used unless the risk of falling branches or trunks striking the unit can be eliminated.

A scissor lift does not require a high-risk work licence to operate. However, the operator should be trained and competent to operate it. A risk assessment will determine if the use of a safety harness when using a scissor lift is required.

6. Crane access method

WHS Regulation section 221

Plant used in connection with tree lopping

The crane access method involves a competent person in the use of a harness, attaching themselves to a crane and the crane then lifting the worker into a working position in the tree. The method is only used to access the tree (i.e. the worker connects to the tree then disconnects from the crane hook and conducts tree work in the usual manner). Once work is complete at the location the worker may, if required, reattach to the crane to be moved to another section of the tree or removed from the tree.

This access method can increase the risk of falls from height, being struck by falling objects, contact with energised electric lines and biting or stinging hazards, including ants, bees, wasps, and snakes. Due to the increased risk, all other access methods of safely accessing a tree should be considered before using the crane access method.

Before a decision is made to use the crane access method, a risk assessment must be conducted. A decision to use the crane access method must not be made unless the risk assessment shows that using this method would not create a greater risk to the health or safety to a worker than climbing the tree, or using plant specifically designed to access the tree.

Methods of access (described in Chapter 4 and 5) include:

- temporary work platforms (e.g. EWPs),
- industrial rope access systems,
- climbing.

The crane access method may be suitable where:

- a worker could become fatigued from climbing, especially in hot or humid climates,
- the physical environment around the tree makes accessing the tree using other methods a higher risk to health and safety (e.g. obstructions like buildings, other trees, adjacent infrastructure, or steep ground).

If the crane access method is assessed as a suitable option, the method should be conducted using slewing telescopic boom-type crane, to minimise the risk of inadvertent crane motions and collision between the boom and tree branches.

6.1 Training and high-risk work licensing

Workers should be competent in tree climbing, trimming and removal work and they must be competent in the use of a harness that must be worn when accessing trees using the crane access method.

The person being lifted by the crane must also hold a high risk work dogging licence if they are directing the crane operator whilst out of view of the operator. Any observer monitoring the person being lifted by the crane that directs the crane operator in the movement of the load must also hold a high risk work dogging licence.

The person operating a crane that requires a high risk work licence must hold a valid high risk work licence.

6.2 Harness

The harness must be a work positioning harness, often called a saddle, for the purpose of lifting and suspending a person. It should be maintained in accordance with the manufacturer's specifications.

Harnesses used for the rope access methods for tree climbing are not suitable for the crane access method. For further information refer to Australian/New Zealand Standard *AS/NZS 1891.1:2020: Personal equipment for work at height – Manufacturing requirements for full body combination and lower body harnesses*,

6.3 Crane safety mechanisms

The crane that is used to lift a worker into a tree must have safety mechanisms to prevent the worker from inadvertently falling. It should also:

- have a minimum safe working limit of 1000 kg at the maximum radius for the task,
- be fitted with:
    - an upper hoist limit that stops the hoist, luff and telescope operating to prevent two-blocking, or be designed so that two-blocking cannot damage part of the crane or lifting gear,
    - controls (e.g. levers and foot pedals with a constant pressure system that stops the crane's motions when the operator removes pressure from the controls),
    - a safety hook that is fixed so that the safety latch cannot inadvertently open,
    - 'drive up' and 'drive-down' controls on both the hoisting and luffing motions.

6.4 Communication

The person being lifted by the crane must be in visual, audio or radio contact with the crane operator. An effective method of communication should also be in place between the crane operator, person being lifted and the observer who is monitoring the person being lifted from the ground. If there is a separate dogman monitoring the load, the dogman must also be included in the communication system.

A secured two-way radio and a backup system like a whistle are examples of effective audio and radio communication.

6.5 Attaching the harness to the crane

Harness attachment to a crane must ensure the safety of the worker being suspended and not interfere with or compromise the safe operation of the crane. This includes avoiding interference with any damage-prevention or warning devices and ensuring that the rope access system remains effective.

When attaching a harness to a crane, PCBUs should ensure that:

- only rated equipment designed for fall-arrest or rope access purposes is used (e.g. connectors, lines, and harnesses meeting the strength requirements of AS/NZS 1891 series),
- the attachment method creates a secure connection without loading the lifting chains or allowing the system to be pinched by chain rings or other fittings,
- a suitable anchor arrangement is established (e.g. false crotch or equivalent), ensuring the climbing line can run freely and without risk of snagging or friction damage,
- excess rope is managed appropriately (for example, stored in a rope bag attached to the harness) to avoid entanglement during lifting or movement,
- friction or rope-control devices used in the system are suitable for the task, and any risks of snagging or interference are considered and controlled,

- workers use secondary means of attachment, such as a lanyard, where required for stability or positioning.

The method of attachment should always prioritise the prevention of falls, safe load transfer, and the ability to perform an effective rescue if required.

6.6 Attaching the worker to the tree

Where a crane is used to assist workers accessing, positioning, or removing parts of a tree, the system of work must be designed to ensure the safety of the worker and not interfere with the safe operation of the crane.

PCBUs should ensure that:

- the crane remains in position until the worker has safely transferred to the tree using two independent attachment points, and the crane operator has received clear confirmation from the worker that the crane connection is disengaged,
- workers only commence trimming or cutting work when secured to the tree by two attachment points. One point should be capable of serving as an alternative means of descent,
- two attachment points are maintained when using cutting equipment, repositioning within the tree, or moving past junctions. The next system should be checked and preloaded before releasing the existing attachment,
- climbing ropes or lanyards used for positioning are managed to minimise potential fall distance, and knots, hitches or devices selected are secure, reliable, and suitable for life support,
- systems are established to prevent the use of knots or hitches that are known to slip, loosen, or roll under load,
- lifting chains, slings, or other gear do not compromise the worker's attachment system,
- the crane is not used to support any other load while a worker is attached,
- the risk of branches breaking due to crane movement while workers are positioned in the tree is minimised, so far as is reasonably practicable,
- workers do not carry out cutting or trimming while attached directly to the crane.

7. Tree work from ladders, cliffs and roofs

7.1 Portable ladders

Portable ladders present a significant risk when used for tree work. Ladders should only be considered when no other reasonably practicable options are available for tasks such as tree hedging or pruning. Where ladders are used, platform ladders are preferred over single or extension ladders as they provide a more stable working surface. Appropriate safety measures, including a fall prevention system, must be implemented to minimise the risk of falls. Safer alternatives, such as EWPs or rope access systems, should be used wherever possible.

Further information can be found in the *Code of practice: Managing the risk of falls at workplaces*.

7.2 Cliffs and other difficult sites

When a tree worker is required to access trees on difficult sites (e.g. trees located on natural cliff faces, retaining walls or steep sloping ground), then safety measures such as industrial rope access systems should be adopted. In these situations, standard tree climbing systems and techniques should not be used.

Industrial rope access is a harness-based fibre rope suspension system. It incorporates the use of a working rope and a safety rope within the system. Techniques for industrial rope access differ from standard harness-based tree climbing techniques and are better suited for non-tree structures or terrains.

7.3 Working on roofs

Situations may occur where trees need to be accessed from roof structures, such as carports or garages, which are under or adjacent to the trees being worked on. When workers are accessing trees or conducting tree work from a roof, there are risks that need to be controlled. The following controls should be considered when working on roofs.

- Ensure a risk assessment is conducted and considers the method of access to the roof, the integrity and strength of the roofing material and potential risk of falls from height off the roof.
- If working at height cannot be avoided, the PCBU must provide a fall prevention device such as guard railing or scaffolding. If fall prevention devices are not reasonably practicable use a work position system such as a travel restraint to prevent workers from reaching an edge where they could fall. If work positioning systems are not reasonably practicable, use fall-arrest systems (e.g. catch platforms, individual fall-arrest systems with harnesses and anchor points or safety nets).
- Ensure risks to others (e.g. occupants) entering the area directly below the access and work areas are controlled.
- Ensure that anyone working on the roof is wearing suitable non-slip footwear.
- Ensure that work is not carried out in inclement weather or in conditions of excessive glare or high winds.

- Where portable ladders are used for access to the roof, the ladders should have non-slip feet and be secured against displacement at the top.
- The stiles of the ladder should extend at least one metre above the stepping off point.
- Ensure that metal or wire bound ladders are not used near electric lines.
- Ensure that the roof material is structurally sound and strong enough to take the weight of the persons and materials which will be on the roof.
- Ensure there is a safe access method for workers to get themselves and materials such as chainsaws onto the roof and back to the ground.
- Establish a drop zone for cut material to be dropped, taking into account location of structures such as windows, that may be struck by material bouncing back against the structure when dropped to ground level.
- Brittle or fragile roofs should not be used to access or conduct tree work.
- Brittle asbestos roofs should not be accessed due to the risk of falling through the roof and the risk of friable asbestos particulates being released.
- Establish a communication system for ground workers and workers on the roof.
- Ensure that any risks associated with material dropping / falling into neighbouring properties are controlled.

Further information can be found in the *Code of practice: Managing the risk of falls at workplaces*.

8. Lowering branches and tree sections

8.1 General precautions

The following safe work practices should be considered during lowering and dismantling tree sections operations.

- The tree climber should give clear warning to the ground workers before any timber is cut, dropped or lowered. The ground workers should acknowledge the warning and clear the drop zone before the operation proceeds.
- Knots and hitches should be selected for their suitability for the given task. The tree climber and ground workers should ensure that the knots and hitches are dressed and set before loading.
- Partly cut or hanging trees or branches should not be left unsecured or unsupported.
- Climbing ropes and equipment should not be used for lowering or dismantling trees.
- Ensure that the climbing system rope is separate from the lowering system rope so that they never come into contact.
- Establish designated drop zones to ensure ropes are kept clear of equipment such as woodchippers, stump grinders to minimise the risk of entanglement.
- Lowering of heavy loads should not be controlled without the assistance of a friction drum. Load control should be maintained at all times during the lowering operation.
- At no time should a person be permitted to walk or be positioned under a suspended load.
- Use of appropriate PPE as identified in the risk assessment.

Following the removal of tree sections and pruning, consider the safety of the tree, in relation to the strength of the remaining tree limbs and trunk, tree pruning and the position of cuts should conform to Australian Standard *AS 4373:2007 Pruning of amenity trees*.

Equipment such as ropes, pulleys, slings and shackles are commonly used during the process of pruning and/or removing trees. This equipment can be assembled and used to aid in the directional control of trees or sections of trees to be pruned, dismantled or felled. The use of ropes and associated equipment for aboveground tree work may be accessed using an EWP or by a tree climber, using tree climbing techniques as determined by the risk assessment.

Workers should use a separate rope (tag line) during the lowering process to deliver more control or direction to the landing position of the load.

Ground workers assisting in the raising or lowering of loads should observe the following:

- before winching, lifting or lowering a load, the working load limit should be determined and observed,
- ensure they never stand in the direct line of a tensioned winch cable or tow-rope or walk under a load,
- ropes should not be wrapped around any part of the body to avoid entanglement or being caught in ground materials,
- ensure that the lowering ropes are long enough,
- after each lowering operation, ensure that any damaged or suspended branches are identified,
- use lowering devices and systems when handling loads,
- when transferring equipment to the climber in the work position, ensure that the equipment does not inadvertently cause damage to ropes.

8.2 Worker competency

Use of lowering ropes requires co-ordination between at least two competent workers. This could consist of:

- the tree climber who is responsible for securing the branch and cutting the sections of tree, and
- the ground worker who is responsible for controlling the load.

Persons operating lowering devices should be trained and assessed as competent according to the manufacturer's instruction manual.

Specific training in the use of lowering equipment should include the following:

- selecting a range of appropriate lowering equipment for a given task,
- demonstrating the inspection of lowering equipment prior to use,
- calculating the weight of loads,
- determining the working load limits of equipment,
- designing slinging configurations for a range of loads,
- calculating safe working loads for a given slinging configuration,
- assessing loads for weight distribution and centre of gravity,
- directing and controlling the movement of loads using hand and whistle signals,
- demonstrating the ability to maintain and store lowering equipment.

8.3 Equipment selection and specifications

An important part of lowering operations is the correct selection and assembly of lowering equipment. The lowering equipment should be proprietary manufactured and load rated. The rated strength should be determined before use. Only rated equipment that is designed for lifting, lowering, or pulling loads should be used for tree work.

Equipment specifications

PCBUs should ensure that the rated strength of lowering equipment is known. Equipment specifications need to be provided on site and by the following methods:

- temporary labelling on the equipment or packaging,
- permanent labelling as an integral part of the equipment (i.e. stitched, stamped or plated),
- manufacturer's instruction manual and documentation supplied with the equipment,
- recorded in a lifting equipment register.

It is important that this information be communicated to the workers performing the work. The manufacturer's instruction manual should be adhered to. Lowering devices should only be modified or repaired by the manufacturer.

Safe working load

The safe working load of lowering equipment is designed to provide a safety factor, and the safe working load should not be exceeded under any circumstances. Care should be taken to calculate the forces generated during possible shock loading operations. The size of the load may be limited by the working load limit of the tree lowering equipment and how it is positioned in the tree.

The load lowering point should not be located over the operational area of the lowering device. If this is not possible then the lowering device should be established on an adjacent tree. The operator must not be located under the suspended load (in the drop zone).

Function of the lowering equipment

Tree lowering equipment is generally assembled to form a system that provides a pulling, lifting or lowering function. Lowering devices are used to assist in the control of loads. Friction can be added or removed depending on the weight of the load. The operator should determine the amount of required friction for a given load. The operator, in consultation with the tree climber, should assess the weight of the load and apply the appropriate friction to the device before cutting begins.

The worker assembling the equipment should determine the safe working load of the components and the lowering system. An example of this may be where a sling is reduced in strength by reeving or increased angles. These factors can reduce the strength of a tree lowering system.

Components of the equipment

The components within these systems should be compatible with each other. Compatibility may involve ensuring that the components have a similar working load limit or that they are designed for a specific rope size or construction.

It is important to remember that a lowering system is only as strong as the weakest component within the system. Every effort should be made to ensure that all the components within the installed lowering system have a compatible safe working load.

Tree lowering equipment should be inspected before, during and after each use. Faulty or defective equipment must be removed from service.

Lowering rope

When the risk assessment deems appropriate, the lowering rope should be run through a diversion pulley to eliminate the risk of the operator being pulled towards the lowering device and the descending load.

The lowering rope should be installed through pulley blocks when the load is required to be pre-tensioned. Natural anchor points should not be used in this situation. The lowering rope should be free of intermediate knots, twists and tangles.

Great care should be taken when adding and removing wraps from a lowering device that is under load. Suspended loads may need to be supported during this process.

8.4 Lowering connection hardware – selection, use and care

Appropriate rated connection hardware, such as shackles in conjunction with pulleys should be used when assembling lowering systems. Connection hardware should have a safe working load appropriate to the loads being lowered. A karabiner or shackle should not be used in place of a pulley.

Lowering connection hardware should be labelled identifying age and working load limit. Labels should be maintained in a readable condition during the serviceable life of the hardware. Hardware should be inspected before and after each use. If damaged removed from service and ensure that it is inspected by a competent person.

8.5 Lowering anchor points – selection, use and care

There are three different types of lowering anchor points:

- primary anchor (the primary anchor that supports the load),
- secondary anchor (the secondary, load sharing or backup anchor),
- redirection / diversion anchor (a third anchor that may be used to change the direction of a load).

When assessing the lowering anchor points consider the following:

- identifying and assessing structural tree defects before selecting and installing lowering anchors,
- where necessary two anchor points should be incorporated into the lowering system,
- multiple load sharing anchors should be selected when installed on smaller diameter stems,
- anchor points should be capable of supporting more than the intended applied load,
- anchor points should be established to minimise the effect on the structural strength of the tree.

8.6 Supporting and roping of tree sections

PCBUs should ensure that the equipment selected and used to assist in the stabilisation, felling or lowering of trees or branches is capable of withstanding both dynamic and static loadings that will be applied to all the components.

Examples of work practices in tree works requiring the application of roping tree sections principles are:

- establishment of guy ropes / cables to assist in the stabilisation of trees,
- use of ropes / cables to assist in the directional felling of trees,
- raising and lowering of tree sections,
- establishment of suitable anchor points for ropes / cables,
- selection of suitable components to be incorporated in rope / cable systems,
- selection of and use of sheaves and winch systems,
- selection and use of slings used at anchor points and in lowering operations,
- selection of suitable ropes and cables for use in roping applications.

The selection of suitable equipment and methods to undertake the work is important to minimise the risk to health and safety and to reduce the risk of injury to persons or damage to property. A competent person is required to undertake the assessment and design the lifting, lowering or directional support system to be used to complete this work activity.

9. Tree felling

As detailed in Chapter 3 of this Code, before attempting to fell a tree by any method, a visual tree assessment should be carried out by a competent person. This assessment should consider:

- the condition of the tree (health, defects, decay),
- wind loading and current weather conditions,
- structural integrity, including branches and trunk,
- location relative to workers, structures, and other hazards.

The visual assessment should form the basis of a site-specific risk assessment to determine the safest method to fell the tree.

Workers on the ground should not be positioned downhill of a tree or branches being felled to avoid the risk of being struck by falling or rolling material. Slopes should be treated as a significant hazard, as material may roll or cartwheel further than on level ground. Exclusion zones should be extended downhill in proportion to the steepness of the slope to ensure all persons remain clear of potential impact areas.

Suitable equipment (such as wedges) should be considered to prevent a tree falling in a direction other than that intended. A scarf and back-cut should be used in felling trees. The operator should move away from the tree, along the planned escape route as the tree begins to fall.

Trees should not be felled by means of powered mobile plant unless a risk assessment has been undertaken which determines that risks have been controlled. Any mobile plant should be appropriately guarded with a falling object protective structure (FOPS) and operated by a competent person.

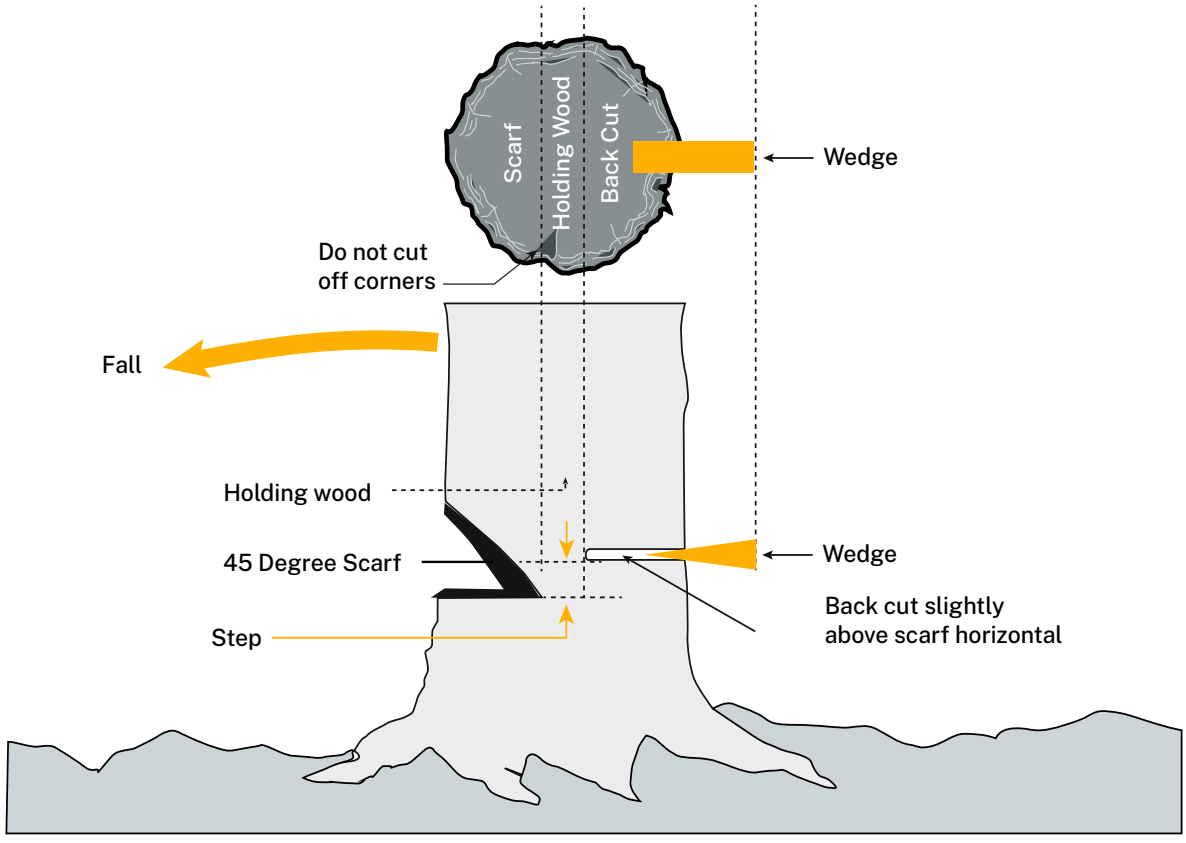


Figure 7: Manual tree felling cuts

There are three types of felling processes normally associated with tree trimming and removal work.

These are:

- clear felling
- controlled directional felling, and
- sectional felling.

Tree felling is a hazardous activity and should only be performed by an appropriately skilled and experienced person or under the supervision of a competent person.

9.1 Clear and controlled directional felling

Clear and controlled directional felling are processes used to safely bring down whole trees or standing trunks from the ground. The technique chosen depends on the available clear space and surrounding hazards.

Clear felling is generally used where there is a minimum of two tree lengths of open space in all directions from the base of the tree.

Controlled directional felling is used where space is limited (less than two tree lengths) or where the natural fall direction would create hazards, such as contact with overhead lines, structures, or hung trees. This method uses ropes, cables, or mobile plant to guide the tree safely to the ground.

Common controls

- Assess trees for hazards, including overhead lines, structural defects, or unstable ground.
- Maintain separation from people, property, and work areas.
- Establish and maintain exclusion and drop zones.
- On steep ground, ensure no person is positioned below the felling area.
- Establish a minimum 45-degree escape route extending at least 6 metres from the stump. Where this cannot be established, implement alternative escape routes or other suitable control measures.
- Minimise risks from elevated hazards, including surrounding vegetation.
- Use equipment safely as per manufacturer's instruction manual.
- Wear suitable PPE as determined by the risk assessment.

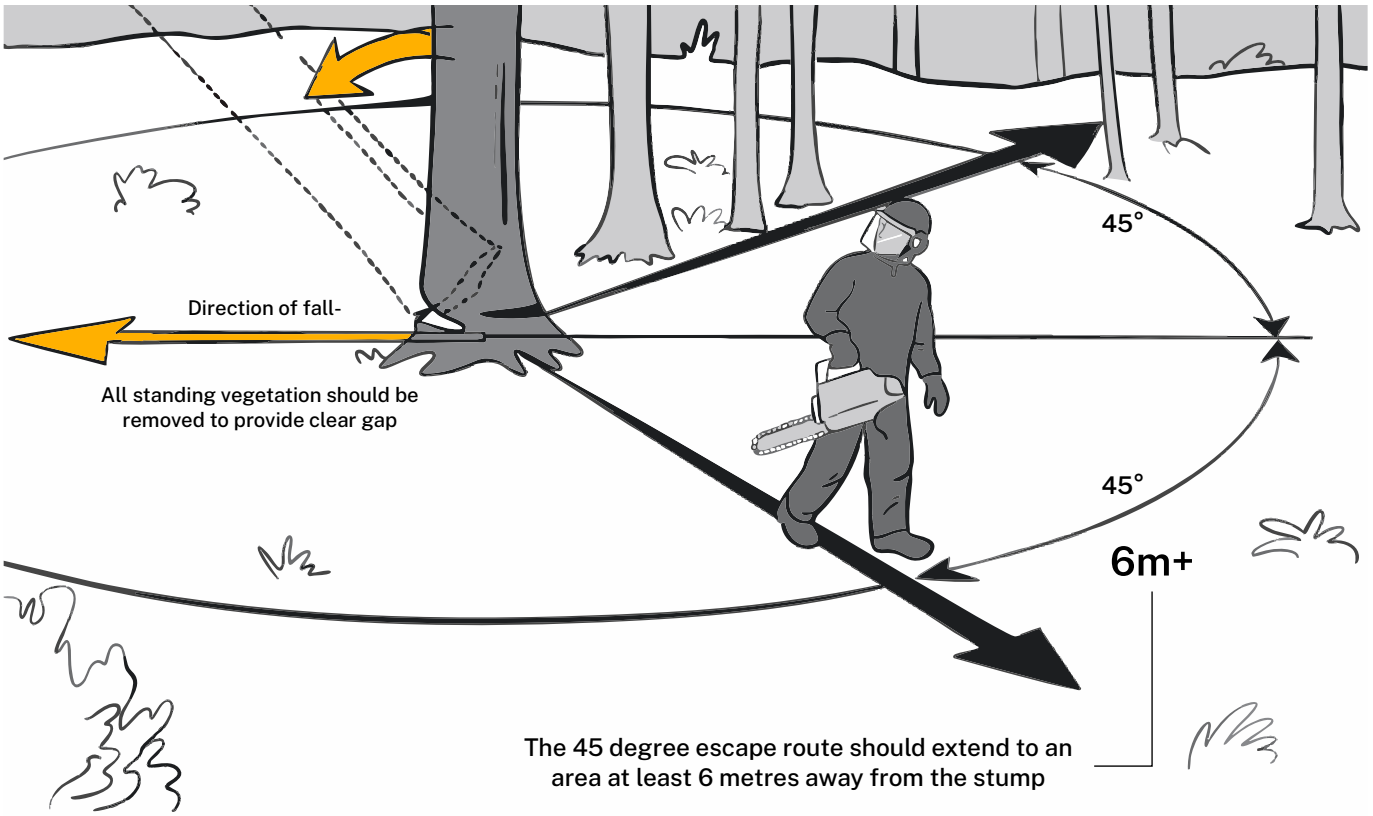


Figure 8: Escape routes and direction of fall

Clear felling – specific controls

- Utilise the tree's natural lean and hinge placement to control the fall.
- Use wedges as needed to assist the fall direction.

Controlled directional felling – specific controls

- Establish the intended fall area and implement measures to control the fall using pulling or pushing methods.
- When using ropes or cables:
  - ensure anchor points are capable of safely holding the total load,
  - if using vehicles or mobile plant as anchors, maintain them outside the drop zone,
  - ensure ropes, cables, and winches are rated appropriately for the expected loads,
  - the number of ropes should correspond to the arc of the drop zone, e.g. 180–90° arcs require at least two ropes,
  - set ropes high in the tree to achieve sufficient leverage for controlling fall direction,
  - consider tree defects or structural issues when selecting anchor points (e.g. multiple trunks).
- Pushing operations must use suitable mobile plant only.
- Wedges may be used to assist in controlled directional felling.

9.2 Sectional felling

Sectional felling is a process of felling sections of the tree by cutting at height and allowing the section to fall.

The following guidelines should be considered:

- the drop zone should be a minimum of 1.5 times the length of the section being felled / dropped,
- the drop zone area may be increased to accommodate the cartwheel or bounce of dropped sections,
- if the drop zone, felling zone or exclusion zone changes it must be communicated and acknowledged by the ground workers,
- potential of damage to underground services and ground surfaces (e.g. roads, footpaths),
- when a tree climber is in the tree or a worker is in an EWP, ensure cut sections are short enough so that, if stood upright, the section cannot reach or strike the climber or the EWP,
- felling uphill should be avoided wherever reasonably practicable due to the increased risk of sections rebounding or sliding back toward the tree. Where it cannot be avoided, additional control measures must be implemented. These should include shorter sectioning, mechanical assistance, and establishing greater exclusion zones.

9.3 Use of powered plant for felling / pushing trees

Powered mobile plant (e.g. excavators, bulldozers) fitted with rollover protective structures (ROPS) and falling-object protective structures (FOPS) may be used to assist with tree felling where appropriate.

Before felling:

- inspect the tree for major structural defects,
- establish and maintain exclusion and drop zones,
- confirm the plant has sufficient height, weight, and stability to control the tree.

During felling:

- position the plant to provide effective leverage, ideally in line with the intended fall,
- keep the plant in place before the tree feller approaches the tree,
- apply only enough pressure to prevent the tree sitting back while cuts are made,
- maintain clear communication between the tree feller and plant operator and agree on a safe escape zone,
- the plant operator must remain in the cab until the tree is safely committed to fall.

Restricted spaces (less than two tree lengths) may require additional measures, such as near-side root removal, adjusted scarf / back cut techniques, or use of ropes to assist in controlling the fall direction.

All ground workers must remain outside the drop zone once cutting begins.

Figure 9: Mobile plant used for directional felling

10. Machinery and equipment

10.1 General safety practices with plant

WHS Act section 19 (3)(b)

Ensure the provision and maintenance of safe plant and structures

WHS Regulation section 203

Manage risks to health and safety

WHS Regulation section 206

Proper use of plant and controls

Plant includes machinery, equipment, appliances, containers, implements and tools and any components or anything fitted or connected to those things. Examples include chainsaws, stump grinders, woodchippers as well as larger types of plant such as mobile cranes and EWPs.

The hazards that may be caused by the plant and equipment in use must be identified, the risks assessed, and eliminated, or if elimination is not reasonably practicable, the risks must be controlled following the hierarchy of control.

A PCBU with management or control of plant at a workplace must manage risks to health and safety associated with plant in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation.

Consideration is to be given to the following:

- plant must be used only for the purpose it was designed for and within its rated capacity,
- plant must be maintained in safe condition,
- inspection, maintenance, repairs, and testing must be carried out by a competent person,
- systems of work are to be provided and maintained, so as to minimise risks to health and safety of persons maintaining, inspecting, altering, repairing, or cleaning the plant,
- safety features, guarding and warning devices must be maintained and used as intended, tested regularly, and not made inoperative,
- ensure relevant available health and safety and emergency information about the plant and equipment (such as the manufacturer's instruction manual) is provided to plant operators, installers, testers, and other persons who may be exposed to a risk from the plant or equipment. This may need to be obtained from the supplier or developed by a competent person,
- safety decals should be correctly located and legible,
- plant should be inspected and serviced regularly and checked daily before and after use. Logbooks and inspection check sheets should be kept. Records should be kept of the machine's usage, including all inspections, maintenance, and any alterations.

Some items of plant require design registration or item registration (or both) before they can be used – refer to Chapter 10.4 Plant Registration.

Further information can be found in the *Code of practice: Managing the risks of plant in the workplace.*

10.2 Powered mobile plant

WHS Regulation section 214

Powered mobile plant – general control of risk

WHS Regulation section 215

Powered mobile plant – specific control measures

A PCBU with management or control of plant at a workplace must manage, in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation, risks to health and safety associated with:

- the plant overturning,
- objects falling on the operator of the plant,
- the operator being ejected from the plant,
- the plant colliding with any person or thing,
- mechanical failure of pressurised elements of plant that may release fluids that pose a risk to health and safety.

A PCBU with management or control of powered mobile plant at a workplace must ensure, so far as is reasonably practicable, that a suitable combination of operator protective devices for the plant is provided, maintained and used.

Operator protection devices

Powered mobile plant should be operated in a manner that minimises the risk of overturning or objects falling on the operator of the plant. Operator protective devices are mandatory on certain types of powered mobile, such as tractors and earth-moving equipment.

Where there is a risk of the operator being ejected from the seat, the plant overturning or an object falling on the operator, the plant must be fitted with an appropriate operator protective device or a combination of them. These could include a seat belt, a ROPS or FOPS. For example, any plant used to push over a tree must have a FOPS.

When purchasing or hiring plant, check that ROPS and/or FOPS comply with Australian Standard *AS 2294.1:1997 Earth-moving machinery – Protective structures*.

Communication devices

Powered mobile plant should be fitted with communication devices for communication between the plant operator and other workers on site. Suitable devices include two-way radios and mobile telephones.

In the event an operator is required to respond to a handheld communication device when communicating, they should cease operation of the plant.

Warning devices

A PCBU with management or control of powered mobile plant at a workplace must ensure that the plant does not collide with pedestrians or other powered mobile plant. If there is a possibility of the plant colliding with pedestrians or other powered mobile plant, the person must ensure that the plant has a warning device or devices that will warn persons who may be at risk from the movement of the plant.

Warning devices must be fitted to powered mobile plant to minimise the risk of people being hit by moving plant. Reversing or moving the plant in a direction where the driver cannot see where they are driving is hazardous. Warning devices should give a clear visual and/or audible warning to workers and people nearby that the plant is moving or is ready to move. Warning devices may include automatic audible alarms, motion sensors, flashing lights, travel alarms, radio sensing devices and horns.

10.3 High risk work licence requirements

Operators of the following items of plant must have the appropriate high risk work licence:

- boom-type EWPs where the length of the boom is capable of extending 11 metres or more,
- non-slewing mobile cranes with a capacity of greater than three tonnes,
- slewing mobile cranes (in categories up to and less than 20 tonnes, 60 tonnes, 100 tonnes and over 100 tonnes capacity).

A dogging high risk work licence is required by a person who is either:

- slinging a load using "slinging techniques," or
- directing a plant operator in the movement of a load when the load is out of the operator's view.

Dogging may be carried out by a person holding a rigging high risk work licence.

Slinging techniques require knowledge and understanding of the suitability and condition of lifting gear, the method of slinging, the nature of the load, its mass, and its centre of gravity.

10.4 Plant registration

In NSW certain types of plant must be registered with SafeWork NSW. There are two types of plant registration – for the design of each type and for each item.

Design registration is a one-off process and covers all units manufactured to that design (except for those units that are subsequently altered). Plant commonly used in tree works that requires design registration include:

- boom-type EWPs,
- hoists with a platform movement in excess of 2.4 metres,
- mobile cranes with a rated capacity greater than 10 tonnes.

Mobile cranes with a rated capacity greater than 10 tonnes also require item registration, which must be renewed annually.

10.5 Cranes

Cranes are used for tree work in varying ways. Cranes can be used:

- to assist in the lowering of tree trunk sections and branches being removed from the tree. For example, where large limbs are located directly over a structure or the area adjacent to tree is inadequate to provide a safe drop zone. During tree removal or pruning, the tree is connected to the crane hook prior to cutting and the crane is used to lower the tree parts in a controlled manner to a designated area,
- to provide a method of access to a tree to perform tree pruning or lopping activities (refer to Chapter 6 for Crane access method).

Completing tree work activities with cranes is considered high risk due to the likelihood of the crane overturning or structural failure of the boom. The risk is due to:

- the unknown mass of the tree limb or material being cut,
- the unknown direction that the timber will fall,
- the shock loading applied to the crane.

These issues will either cause the load radius to increase or apply a side loading to the boom. Safe crane operation requires that only vertical loads be applied to the hoist rope and the loads be applied gradually. Operation of the cranes should be conducted as per the crane manufacturer's instruction manual.

Mobile cranes should not be used for tree removal or pruning unless the following can be ensured:

- a safe location from which the crane can safely operate within design parameters,
- the crane operator, or other workers hold appropriate high risk work licences if required for the class of work task being undertaken,
- the site workers, crane operator and dogman consult with each other,
- the site workers, crane operators and dogman have a means of communication,
- side loading will not be applied to the crane boom,
- any loading to the crane is well within the crane's safe working load,
- the crane will not be shock loaded,
- wind will not adversely affect the safe use of the crane,
- appropriate traffic and pedestrian controls are in place,
- sufficient area is established as a drop zone for placing cut material at ground level,
- loads should be lifted vertically with no sideways load applied to the hoist rope and associated lifting components,
- at completion of the saw cut, the radius of the load will not increase e.g. incomplete removal of branches creating imbalance in the load.

The general principles of crane operation should be employed and the following taken into consideration when setting up the crane:

- location of overhead electric lines,
- ground conditions such as compaction, when positioning outriggers / stabilising legs,
- existence of underground tanks and services,
- establishing an exclusion zone around the crane to prevent persons from entering the working radius,
- to minimise the risk of injury to the operator from passing traffic, measures must be taken to separate mobile plant from vehicular and pedestrian traffic,
- if necessary appoint an observer to ensure that people do not enter the area, this may be particularly necessary in public areas,
- a designated drop zone of sufficient size is established and maintained at ground level for the safe placement of cut or lifted material,
- only vertical loads will be applied to the hoist rope and crane hook,
- at the completion of the saw cut, the radius of the load will not increase.

For further information refer to Australian Standard *AS 2550.1:2011 Cranes, hoists and winches – Safe use - General requirements.*

10.6 Woodchippers

Woodchippers are used in tree trimming and removal work to reduce tree waste by converting tree limbs and branches into woodchip or mulch. While the individual model of plant may vary in design, they all operate on the same principle - a rotating disc or drum fitted with hardened steel blades breaks down the tree material into wood chips or mulch.

Pre-operational checks

Before using a woodchipper, the operator should perform preoperational checks to ensure the machine is safe for use by considering the following:

- maintenance has been conducted in accordance with the manufacturer's specifications or recommendations,
- guards for all dangerous parts such as cutting discs, drive shafts, belts and pulleys are in place, secure and undamaged,
- all safety devices are functioning correctly, including emergency stops, bump bars, covers and decals,
- blades, cutting or grinding parts are sharp and secure,
- all decals and safety notices are in place, undamaged and legible,
- the feed chute or feed table of a woodchipper has sufficient height on its side walls to prevent the operator coming into contact with the blades or knives during operation and extend to the leading edge of the in-feed chute to prevent the operator or person feeding the machine being entangled.

Using woodchippers

The machine should always be used in accordance with the manufacturer's instruction manual which will outline safe operation instructions, recommendations and specifications. If not available the manual should be sourced from the supplier or manufacturer in the first instance.

If the manufacturer's instruction manual cannot be obtained, consider having instructions for the safe operation of the woodchipper developed by a suitably qualified person.

When using the machine, the following precautions should be observed:

- ensure the operator wears appropriate PPE such as safety helmet, safety boots, respiratory, eye and hearing protection as identified in the safe work procedures,
- ensure workers involved in the woodchipping operation wear close fitting clothing to prevent entanglement, being pulled into the in-feed chute or the machines cutting blades. Loose-fitting clothing, trims or drawstrings poorly fitted gloves or, jewellery can increase the risk,
- detach and clear any winch lines prior to feeding logs or branches into the chipper,
- establish an exclusion zone to prevent unauthorised persons entering the working area and being exposed to the plant operation.

Further information can be found in SafeWork NSW's *Woodchipper guide* and Australian Standard *AS 4024.3701:2020 Safety of machinery - Forestry machinery – Wood-chippers*.

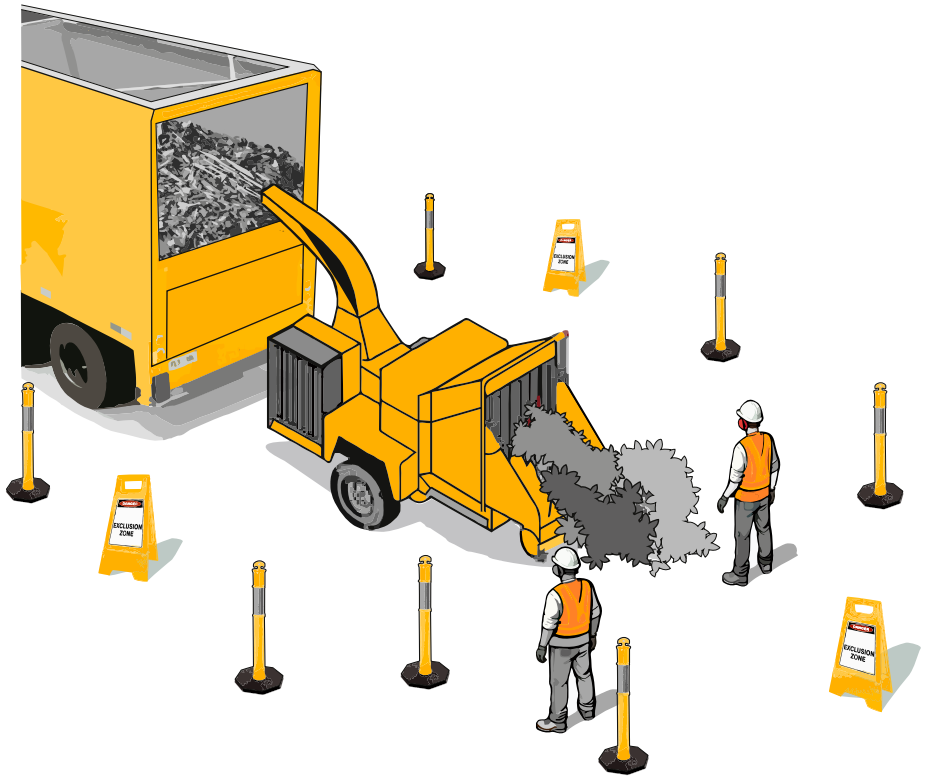


Figure 10: Woodchipper

Feeding woodchippers

The woodchipper operator should stand to the side of the in-feed chute and feed tree waste into the woodchipper butt end first. Once the tree waste is caught by the in-feed rollers the worker should stand clear to avoid contact with the branches or log. A push-stick or another branch should be used for shorter branches to avoid reaching into the in-feed chute. The act of reaching into the in-feed chute creates a hazard for workers with the potential for serious injury or death if the woodchipper operator or a worker becomes entangled or material is ejected from the woodchipper during the feeding process.

When using the machine, the precautions outlined in Table 3 should be observed to protect the operator.

Table 3: Safe woodchipper use

Control	Details
Parking the machine	Park the machine off the road whenever possible. If not, ensure appropriate traffic management, such as using a shadow vehicle as a barrier. Feed from the verge side of the chipper, not the roadside.
Stopping and isolating the power	Stop the machine, isolate the power, and wait for moving parts to stop spinning before attempting to remove blockages.
Plant isolation process	Follow the manufacturer's instruction manual for plant isolation.
Clearance from working area	Ensure the woodchipper is set up with sufficient clearance from the immediate working area or drop zone to avoid entanglement from ropes.

Control	Details
Emergency stop functionality	Ensure that emergency stops and the control bar are functioning properly. Should be tested daily as per preoperational checklist.
Operating team competence	Ensure operating teams consist of at least two people who are competent in the use of woodchipping machines and have received specific training.
Material contamination	Ensure the material to be chipped is free from metal, stones, plastic, rope, and other contaminants that could damage the machine or be ejected in the direction of workers or others.
Feeding branches into the machine	Feed branches into the machine butt first, releasing the material once gripped by the in-feed rollers.
Feeding position	Feed branches off the centre line. If possible, feed from the kerb side.
Use of push-stick	Use a push-stick at least 1.5 m long or another branch to feed shorter material into the machine.
In-feed chute safety	Never reach into the in-feed chute without stopping the in-feed rollers.
Stop bar on drop down table	Ensure a stop bar is fitted to the drop-down table at the rear before use.
Machine supervision	Never leave the woodchipper unattended while it is in operation.

10.7 Stump grinders and root pruners

Stump grinders use a rotating cutting disc or wheel to grind away stump wood and surface roots to below ground level.

Before stump grinding is carried out, precautions should be observed including:

- checking for underground services around the stump (contact Before You Dig Australia) if the penetration exceeds 200mm below surface or where there are concerns regarding underground services,
- establishing an exclusion zone to ensure pedestrians are kept at a safe distance from stump grinder operations,
- looking for loose stones, pipes, metal, concrete or other debris that could affect the safe operation of the machine or become dangerous projectiles,
- manually excavating and exposing buttress roots,
- ensuring machine guards and debris curtains are suitable to the task and securely in place,
- making sure teeth and teeth mounting pockets on the cutting wheel are sharp and secure,
- checking the safety cut-off or emergency stop is in working order during the pre-start check each time the grinder is used.

Contact with the stump should be with the lower-outer quadrant of the grinding wheel to prevent a kickback reaction.

Stump grinders should be used in accordance with the manufacturer's instruction manual. Appropriate and suitable PPE should be used for dust and when chemicals have been used to poison stumps.

A protective screen or barrier should be set up to separate people from the stump grinding operation if there is public access to the site. The barriers should also stop flying debris and warn people stump grinding is in progress.

When stump grinding operations are carried out close to road verges or footpaths the cutting head should be positioned to direct woodchips away from passing traffic and pedestrians.

When using the stump grinder or root pruner, the following precautions should be observed to protect the safety of the machine operator:

- wear appropriate and suitable PPE such as respiratory, eye and hearing protection,
- do not wear loose clothing that could be drawn into the machine,
- do not leave the controls while the cutting wheel is moving,
- avoid working downhill from the machine wherever possible,
- ensure that the cutting wheel is not moving before cleaning excess grindings away from the grinding area,
- stop the machine, isolate the power and wait for moving parts to stop spinning before attempting to clear blockages.

Control measures may also be needed to ensure excavations do not create a trip hazard for pedestrians or other workers once the stump grinding operations are completed.

10.8 Chainsaws

Chainsaws are potentially dangerous types of plant that can cause fatal or serious injuries especially if used by untrained workers. Chainsaws should not be operated above shoulder height due to the risk of musculoskeletal disorders, vibration and reaction forces from the chainsaw. Chainsaws (including top-handled chainsaws) should not be operated one handed. A pole saw may be used for small branches above shoulder height. For larger branches, an EWP or other alternatives should be considered.

Site assessment and preparation

- Before commencing chainsaw operations, a site assessment should be undertaken to identify hazards. Consideration should be given to factors such as uneven ground, overhead services, loose debris, wildlife, weather conditions, and potential for falling or rolling timber.
- Exclusion zones should be established and maintained around the work area to prevent unauthorised entry.
- Workers should ensure they have clear escape routes, adequate footing, and good visibility before starting cutting.

Working alone

- Chainsaw use should be avoided when working alone, wherever reasonably practicable.
- If working alone is unavoidable, a communication system should always be in place (e.g. regular check-in calls, radios, or alarms), and the worker must have access to first aid.

Safe use of chainsaws

- Chainsaws should only be operated by trained and competent persons.
- Operators must wear any suitable PPE provided by the PCBU including helmet, hearing protection, eye/face protection, cut-resistant leg protection, gloves, and safety footwear.
- Chainsaws should be maintained in accordance with the manufacturer's instruction manual, with safety features (e.g. chain brake, throttle lock, chain catcher) kept in effective working order.
- Starting, refuelling, and cutting techniques should follow safe work procedures to minimise risks of kickback, slips, or contact injuries.

Chainsaw selection

Chainsaws should be selected for their suitability for the intended work and conform to the appropriate Australian Standard as listed below:

- *AS 2726.1:2004 Chainsaws – Safety requirements – Chainsaws for general use*
- *AS 2726.2:2004 Chainsaws – Safety requirements – Chainsaws for tree service*

In general, a chainsaw with the shortest practicable guide bar length for the task should be selected. For tree work, this may mean a range of chainsaws with different guide bar lengths will be required.

PCBUs should ensure the saw chain is tensioned correctly and sharpened to the manufacturer's specifications paying particular attention to the depth gauges.

Starting chainsaws

When starting a chainsaw, operators should maintain a safe working distance from other people and ensure the saw chain is clear of obstructions. After refuelling the chainsaw, move away from the fuel source before starting the engine.

When starting a chainsaw with a cold engine, operators should:

- place the saw on level ground and apply the chain brake,
- set the controls as stated in the manufacturer's instruction manual,
- secure the saw by placing a foot on the rear handle base plate and a hand on the front handle, and
- pull the starter cord firmly.

Chainsaws being used on the ground should preferably be started by holding them on the ground. In circumstances where ground conditions do not permit this, chainsaws may be started while being held between the knees wearing appropriate PPE. Chainsaws should not be drop-started.

Where a chainsaw is being used in a tree, the practice of drop-starting may sometimes be necessary and may be allowed under specific conditions. Strict safety protocols should be followed, such as:

- ensuring the chainsaw is securely held and controlled during the drop-starting process,
- having adequate training on safe handling and starting techniques.

When drop starting chainsaws in a tree the chain brake should be applied and the chainsaw held by the front top handle. However, the chainsaw should be first warmed up on the ground, then stopped, before being sent up to the tree climber.

Chainsaw reaction forces

Kickback

The reaction known as kickback may occur when the saw chain on the upper quadrant of the guide bar tip touches an object. In most cases, tip contact may cause a rapid reverse reaction, kicking the guide bar up and back towards the operator.

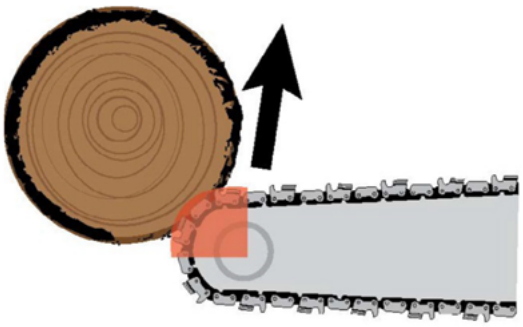


Figure 11: Chainsaw kickback

Pushback

The direction of movement of the chain causes pushback when the top of the bar is used for cutting. Using the top of the bar is advantageous in some instances however the operator should brace for the saw response.

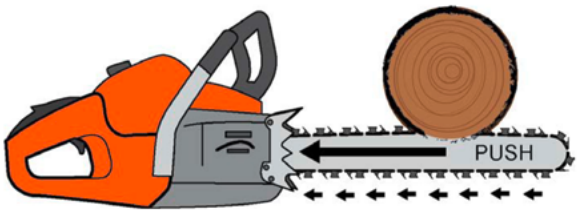


Figure 12: Chainsaw pullback

Pull-in

The direction of the chain movement causes either the saw to be pulled towards the tree part being cut, or the tree part towards the saw depending on the mass of the tree part. Light branches may be pulled towards the operator or the saw may pull towards heavier tree parts.

The operator should place the bumper spike of the saw against the wood to negate this reactive force. Where the saw contacts an unexpected obstacle, for example a nail in the wood, the severity of these sudden reactions may cause the operator to lose control of the chainsaw which could result in serious injury.

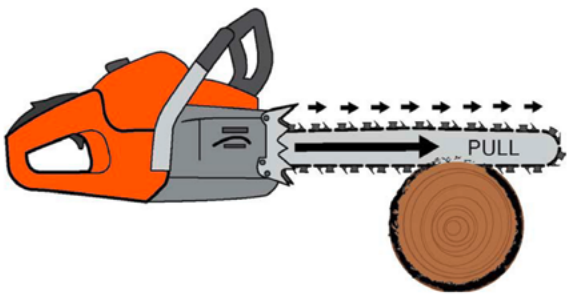


Figure 13: Chainsaw pull-in

Controlling chainsaw reaction forces

Table 4: Controlling chainsaw reaction forces

Control	Details
Operator competency	The operator should be trained and competent to use a chainsaw. Understand reaction forces such as kickback, push-back, and pull-in.
Footing and balance	Establish secure footing and maintain correct balance. Stand with the one leg forward to stabilize the body.
Proper handling	Keep a firm grip on the chainsaw with both hands, one hand on the rear handle and the other hand on the front handle.
Two-handed operation	Never operate the chainsaw with one hand. Always use both hands for control.
Clear work area	Ensure the cutting area is clear of unnecessary people, plant, and obstructions. Avoid contact with the nose of the guide bar.
Cutting technique	Start cuts at full or high engine speeds, then slow down towards the end of the cut to avoid hitting the ground.
Cutting stability	Only cut one piece at a time and ensure it is stable before starting the cut.
Awareness of kickback zone	Be aware of potential contact with the kickback zone when re-entering a previous cut. Avoid twisting the chainsaw when withdrawing the guide bar.
Obstacle detection	Check for nails, stones, or other obstacles in the wood before cutting. Remove them if found.
Starting the cut	Start the cut with the spiked bumper or body of the chainsaw in contact with the wood.
Saw maintenance	Follow manufacturer's instruction manual for sharpening, tensioning, and maintaining the saw chain.
PPE	Wear appropriate PPE including chainsaw-protective clothing, safety footwear, helmet, eye protection, ear protection and gloves.

Limbing and cross cutting

When cutting up branches on the ground, there is a significant danger of the operator being injured by branches swinging back or dropping down or the tree shifting during the limbing process.

Workers should observe the following safety precautions:

- stand in a safe working position and watch out for obstacles,
- identify and clear a suitable escape route (path of retreat) that allows quick and unobstructed movement to a safe zone in the event of an unexpected tree or limb movement,
- be aware of other people in the work area,
- when cutting be aware of where the tip of the bar is at all times to avoid kick back,
- any log that might roll should be chocked into position,
- be aware of tension and compression factors.

Working with chainsaws in trees

Only trained and competent workers should use chainsaws in trees. The size of the chainsaw used should be appropriate for the work being performed. When a tree climber carries equipment including chainsaws, ensure the total weight of the climber and the equipment is within the working load limit of the climbing system.

The following controls should be implemented when working with chainsaws in trees:

- tree climbers should not start or operate chainsaws unless they are in a safe and stable working position,
- when operating cutting equipment, workers should maintain two independent means of attachment to suitable anchor points, wherever practicable from independent anchor points,
- the chainsaw should be started close to the working position and ensure that the chain is clear of the operator, obstacles and equipment before starting,
- use two hands to operate a chainsaw and do not operate the chainsaw above shoulder height,
- apply the chain brake between cuts,
- ensure the chainsaw is attached, e.g. via a tool lanyard, when working above ground.

Working with chainsaws in trees – selection tool lanyards

The tool lanyard should be long enough to allow full reach and for the chainsaw to hang below the tree climber's feet when not in use. If connection hardware forms part of the lanyard then that hardware should be marked with a load rating. The connection hardware should also be auto locking with three consecutive actions to open it. The tool lanyard should incorporate a weak link that will allow it to be separated from the harness in the event of extreme loading.

Chainsaw use in EWPs

When starting a chainsaw in an EWP, the chainsaw should be started outside the bucket or platform. The chainsaw should be attached to the operator, bucket or platform by a tool lanyard.

10.9 Pole saws

Pole saws are designed for light to medium trimming of elevated tree limbs and branches. They can be petrol, electric (battery or mains), hydraulically or manually powered.

Only persons with appropriate training, skills and knowledge should operate pole saws. They should be capable of carrying out pre-start and post-start checks of pole saws and use basic pole saw cutting techniques. The size and length of the pole saw used should be appropriate for the work being performed.

When performing trimming work above ground from an EWP the pole saw should be attached at all times, e.g. via a tool lanyard or tool strop. The attachment may vary and depend on the task being performed and the type and size of the pole saw. During refuelling or changing saws a rope is used to transfer the pole saw to the ground.

The following controls should be implemented when working with pole saws:

- type and quantity of trees to be trimmed are identified and assessed for safe working conditions,
- equipment is selected appropriate to work requirements and checked for operational effectiveness in accordance with manufacturer's recommendations,
- pre start-up checks are carried out on equipment in accordance with site requirements,
- trimming activities are planned in accordance with site procedures,

- communication with others is established and maintained,
- operators should not start or operate pole saws unless they are in a safe and stable working position,
- the pole saw should be started close to the working position and ensure that the chain is clear of the operator and other persons, electric lines, obstacles and equipment before starting,
- approach distances around electric lines must be observed, refer to Chapter 11,
- use two hands to operate a pole saw and do not operate the pole saw at heights without a lanyard in place to prevent the saw falling to the ground,
- switch the pole saw off when moving between work positions and allow the chain rotation to stop prior to commencing a new cut,
- pole saws should not be sharpened or refuelled in an EWP or in elevated positions,
- UV protection eyewear should be worn by operators to protect from sun glare,
- environmental conditions are assessed and used to plan the trimming of each tree,
- movement and whereabouts of other workers are monitored,
- tree, location and stability are assessed for conditions likely to affect safety of trimming activities,
- all petrol engine saw exhaust guards are in place when using the saw in close proximity to the body to prevent burns.

11. Electrical safety

WHS Regulation section 166

Duty of person conducting a business or undertaking

This chapter provides specific guidelines for working on trees, including cutting, trimming, and other processes near electric lines. This applies when:

- a person, or something they are holding or in contact with, could come closer than the specified approach distance in Table 5 or Table 6), and/or,
- the work poses a risk of damaging electric lines or electrical apparatus.

Tree work (including pruning or tree removal) near live electrical lines (also known as power lines) can be hazardous due to the high-risk of death or serious injury from direct contact, arcing or induction.

The risk arises when workers or equipment comes too close or makes direct contact with the live conductors.

A PCBU must ensure, so far as is reasonably practicable that no person, plant or things at the workplace comes within an unsafe distance of an overhead or underground electric line. To manage the risk, a PCBU must ensure that a risk assessment is conducted in relation to the proposed work.

11.1 Hazard identification and risk assessment

Tree and vegetation management activities involve electrical hazards, which may arise in various circumstances, such as:

- branches or other vegetation falling onto electric lines during trimming operations,
- tools like electric saws or trimmers coming into direct contact with electric lines or other associated electrical apparatus,
- mobile plant, such as an EWP, coming into contact with overhead electric lines or other associated electrical apparatus,
- electric lines breaking and falling on the ground, footpath, or road,
- wind blowing branches or limbs against overhead electric lines,
- high winds causing a loss of control while lowering materials,
- unexpected movement of the worker, mobile plant, or vegetation relative to the worker.

If a hazard related to tree management work near overhead electric lines is identified, the PCBU must conduct a risk assessment. This assessment helps determine the risk to individuals getting too close to the relevant approach distances. This step allows the PCBU to evaluate the level of risk associated with identified hazards and establish a priority list based on the level of risk.

11.2 Eliminating or controlling risks – general risk factors

The risks linked to electrical hazards stem from proximity to live conductors. The most effective way to eliminate these risks is to prevent people, their equipment, and materials from getting close to live conductors, avoiding direct contact or flashovers.

When planning the work, it is crucial to identify potential exposure to electrical hazards and determine the most effective methods to ensure that people and equipment maintain safe distances from live overhead electric lines.

In addition to ensuring that work near overhead electric lines is avoided, other factors listed below should be considered.

- Always assume that overhead electric lines are live unless an access authority or written documentation has been received from the electricity supply authority.
- Do not assume that a telecommunication cable is harmless; treat it with caution.
- Trees and tree branches can conduct electricity, even in dry conditions. Never assume it is safe for them to touch or rest on overhead electric lines. If there is a risk during felling or cutting that they might come closer than the approach distances in Table 5, the electric lines should be de-energised.
- Do not cut trees in contact with live overhead electric lines unless using a safe system of work approved (in writing) by the electricity supply authority.
- Plant near overhead electric lines can become energised, posing a serious danger. Maintain the relevant approach distances when operating any machinery, tools, or equipment near overhead electric lines and cease operations if safety distances are compromised.
- Manage traffic and pedestrians to ensure safe distances from electric lines. If the work requires changes in traffic or speed limits, follow full traffic control measures as per Transport for NSW's *Traffic control at work sites Technical Manual* and/or local council requirements.
- Plan ahead and consider potential sudden weather changes including but not limited to electrical storms, heavy rain, or strong winds that could impact the proposed work.
- Consider the use of non-conductive tools and equipment.

11.3 Requirements for ordinary persons carrying out tree and vegetation management

An ordinary person should not:

- climb a tree within 3 metres of electric lines or cut branches that might come within 3 metres of these electric lines during the work,
- allow any part of their body, anything they are holding, or anything attached to their body to approach closer than the distances specified in Table 5 of this Code when working near electric lines,
- ensure work is not performed above electric lines or where any part of the tree or vegetation might fall within the specified approach distances in Table 5,

If there is a reasonable possibility of work being done above electric lines or closer than the approach distances in Table 5, trained persons with proper training and current competency in 'tree and vegetation management' near live electric lines should conduct the work.

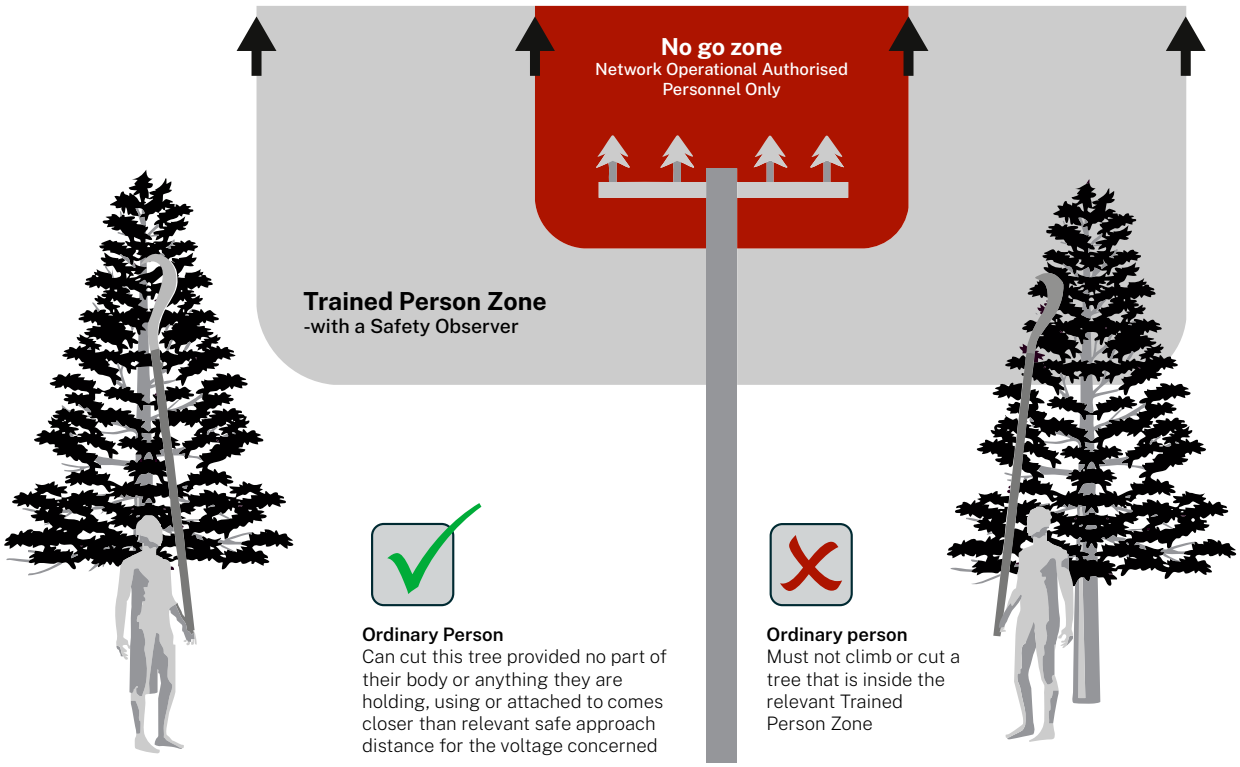


Figure 14: Ordinary person vegetation management guide

11.4 Electrical approach distances

Ordinary person zone

Table 5 provides approach distances for:

- ordinary persons performing work near electric lines, (including plant, hand tools, equipment or any other material held by a person), or
- cranes (and their loads) and items of mobile plant operated by an ordinary person near overhead electric lines.

Table 5: Approach distances (in metres) for work performed by ordinary persons

Nominal phase to phase A.C. voltage (volts)	**Approach distance (m)**
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
Nominal pole to earth D.C. voltage (volts)	**Approach distance (m)**
Up to and including +/-1500 Volts	3.0

Note: Where a risk assessment determines it necessary, the use of a safety observer should also be considered for work performed by ordinary persons working outside but up to the approach distances specified in Table 6.

Trained person zone

Table 6 provides approach distances for:

- trained persons with a safety observer who are performing work near overhead electric lines (including plant, hand tools, equipment or any other material held by a person), or
- cranes (and their loads) and items of mobile plant operated by a trained person with a safety observer near overhead electric lines.

The approach distances in Table 6 are based on:

- completion of a risk assessment prior to the commencement of work,
- application of a safe system of work, which includes the use of a safety observer,
- if determined by the risk assessment, consultation with the electricity supply authority regarding the proposed work and compliance with any conditions imposed by the electricity supply authority for the work.

Table 6: Approach distances (in metres) for work performed by trained persons, with a safety observer

Nominal phase to phase A.C. voltage (volts)	**Approach distance (m)**
Insulated low voltage cables up to 1000, including LV ABC	0.5
Un-insulated low voltage conductors up to 1000	1.0
Above 1000 up to and including 33,000	1.2
Above 33,000 up to and including 66,000	1.4
Above 66,000 up to and including 132,000	1.8
Above 132,000 up to and including 220,000	2.4
330,000	3.7
500,000	4.6
Nominal pole to earth D.C. voltage (volts)	**Approach distance (m)**
Up to+/-1,500	1.0

11.5 Requirements for trained persons carrying out tree and vegetation management

Trained persons, including a person holding *UET20321 Certificate II ESI – Powerlines Vegetation Control* or an equivalent qualification, with current competency in 'tree and vegetation management' near live electric lines may conduct the work following the approach distances specified in Table 6 of this code, provided the following requirements are met:

- complete a risk assessment for the work and implement a safe system of work, including the presence of a safety observer,
- if determined by the risk assessment, consult with the electricity supply authority about the proposed work and adhere to any conditions set by the electricity supply authority for the work.

11.6 Tree management inside the no-go zone – approval of the electricity supply authority

The “no-go zone” is the area around electric lines into which no part of a person, material, crane, vehicle, or item of plant may encroach without obtaining written approval from the electricity supply authority. It is crucial to maintain a safe distance from electric lines, extending vertically to the sky above.

Note:

- Person - includes hand tools, equipment or any other material held by a person.
- Plant - includes the load, controlling ropes and any other accessories associated with the plant.

Work required on trees and vegetation within the no-go zone (closer to live electric lines than the approach distances specified in Table 6 of this code) must only be performed by authorised persons approved by the electricity supply authority.

11.7 Trees or branches contacting electric lines

When working near trees that might fall on electric lines, it is crucial to know what to do if a branch or tree contacts electric lines, whether due to pruning, wind, storm, or other damage.

1. **Do Not Touch:** If any part of a branch is touching electric lines, the entire branch may be ‘live,’ including the leaves. Touching any part resulting in an electric shock, or an arc flash explosion that may result in a serious injury or death.
2. **Contact the electricity supply authority:** Immediately inform the electricity supply authority about the situation. Keep all individuals clear of the area while waiting for assistance.

Further information can be found in the *Code of practice: Work near overhead and underground electric lines*.

11.8 Working near low voltage overhead service lines

For the purposes of this Code ‘low voltage overhead service lines’ are:

- Covered low voltage service mains and associated electrical apparatus connecting from the supply point (overhead electric lines) to the point of attachment on the consumer’s building, pole, or structure.
- Covered low voltage consumer sub mains and related electrical apparatus within the consumer’s electrical installation.

To enhance safety protocols, consider integrating the “Look up and Live” tool into overhead planning tools. “Look up and Live” provides the location of electric lines in different regions across Australia. PCBUs can access critical data about the location, height, and voltage of electric lines in their vicinity, enabling them to plan work activities safely and avoid potential hazards.

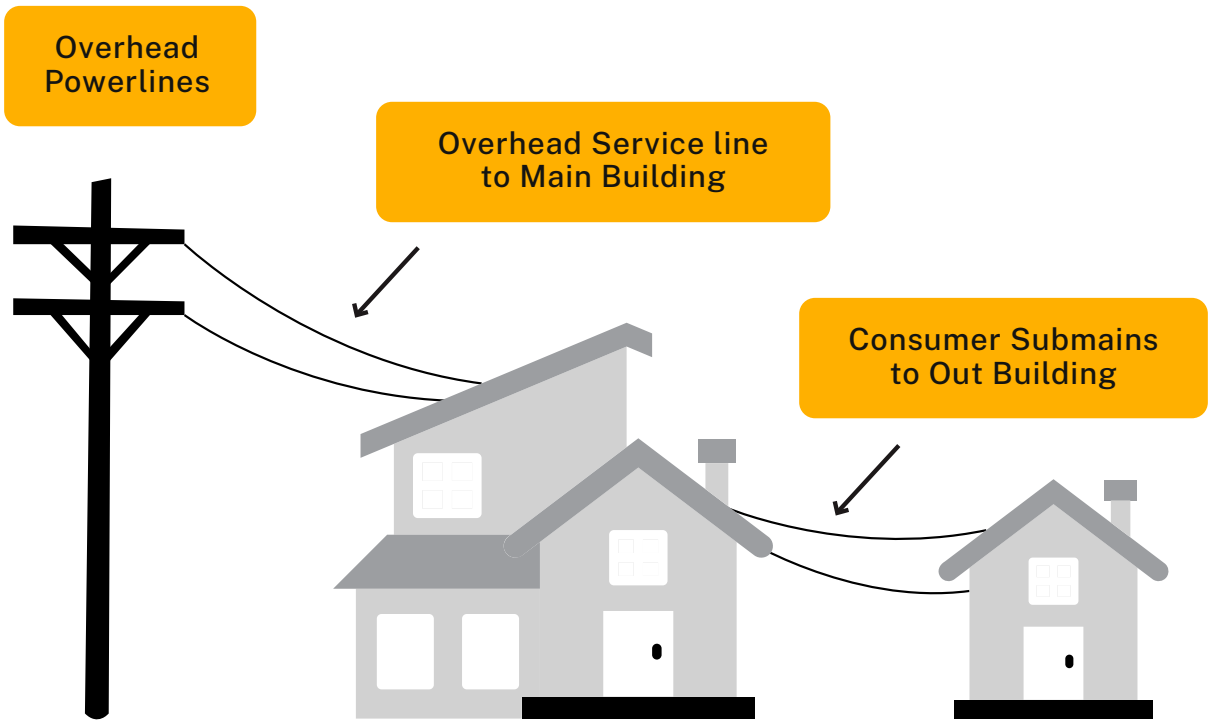


Figure 15: Low voltage overhead service lines

11.9 Other underground assets

WHS Regulation section 304

Excavation work — underground essential services information

Underground assets, including electrical cables, gas pipes, water and sewer lines, and other buried services, can present serious hazards. Before commencing work, a site assessment must be carried out to identify the location of all underground services. A person with management or control must take all reasonable steps to avoid striking, contacting, or cutting underground assets when using plant, equipment, or hand tools. The type of plant or equipment (e.g., outriggers, stump grinders, digging or excavation equipment) must be considered to ensure ground penetration or contact with underground services is eliminated or minimised.

PCBUs must manage risks to health and safety associated with excavation work in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation. Safe work procedures and exclusion zones should be established wherever excavation, ground penetration, or other potentially hazardous activities are required. Consideration should be given to the presence and location of:

- live electrical cables,
- gas pipelines,
- water pipes,
- sewerage mains,
- telecommunication cables,
- other services that could be encountered (e.g. drains, underground tanks, decommissioned septic tanks).

When excavating in a public place, the PCBU must take all reasonable steps to identify electrical cables. Information may be obtained using tools such as Before You Dig Australia (BYDA), a free enquiry service providing details of underground assets anywhere in Australia. Definite cable locations can be confirmed through arrangements with relevant authorities, which may include:

- electricity supply authorities,
- communication companies,
- local government authorities,
- water authorities.

For further guidance refer to the *Code of practice: Excavation work*.

12. Personal protective equipment (PPE)

A PCBU who directs the carrying out of work must provide PPE to workers at the workplace, unless the PPE has been provided by another PCBU. Chapter 2.1 provides details of circumstances when it is mandatory to work through the hierarchy of control measures to manage certain risks.

A risk assessment should be undertaken to determine suitable and appropriate PPE.

Where PPE is determined to minimise and control risks in certain tasks or situations, the PCBU must provide the required PPE to each person at risk and ensure that:

- the PPE is appropriate, fitted correctly, maintained in good condition, correctly stored, used correctly and controls the risk for that person,
- workers are trained to know how and when to use PPE properly, its limitations, and how to look after and store the equipment,
- PPE is regularly inspected and maintained in a clean and fully effective condition. Defective equipment must not be used,
- PPE is used or worn by workers (or other persons in the workplace to whom it is provided). Supervisors should regularly check the usage of PPE,
- PPE is repaired or replaced as necessary.

Depending on the work being done and the equipment used, use of the following items should be considered:

Table 7: PPE items

PPE	Description	Relevant Australian or Australian/New Zealand Standard
Safety helmets	Helmets with ear and eye protection components and a chinstrap for protection against falling objects and impacts	*AS/NZS 1801:2024 Occupational protective helmets*
Safety harness	Protects against risk of falls from height	*AS/NZS 1891.1:2020 Personal equipment for work at height – Manufacturing requirements for full body combination and lower body harnesses* *AS/NZS 1891.4:2025 Personal equipment for work at height – Selection, use and maintenance*
Safety eye wear	Protects against flying debris such as wood dust	*AS/NZS 1337.1:2010 Personal eye protection – Eye and face protectors for occupational applications*
Sun protection	Protection from UV radiation, including tinted eye wear, sunscreen, hats, and UV protective clothing	N/A
Safety gloves	Provides protection, comfort, and durability when handling branches and debris	*AS/NZS 2161.3:2020 Occupational protective gloves – Protection against mechanical risks*

PPE	Description	Relevant Australian or Australian/New Zealand Standard
Protective footwear	Protects against falling objects and heavy equipment, such as chainsaws	*AS/NZS 2210.1:2025 Safety and occupational footwear – Guide to selection, care and use*
Respiratory protection	Reduces risk of inhaling dust and harmful particles	*AS/NZS 1716:2012 Respiratory protection devices*
Hearing protection	Prevents hazardous noise exposure from machinery and plant	*AS/NZS 1269 (Series): Occupational noise management* *AS/NZS 1270:2002 Acoustics - Hearing protectors*
High visibility clothing	Increases visibility in areas with moving traffic or plant hazards	*AS 4602.1:2024 High visibility safety garments – Garments for high risk applications*
Cut-resistant leg protection, i.e. chaps	Protects legs against chainsaw cuts	*AS/NZS 4453.3:1997 Protective clothing for users of hand-held chainsaws – Protective legwear*
Wet weather gear	Provides protection from rain and wet conditions	N/A

13. Work environment hazards

13.1 Noise

WHS Regulation section 57

Managing risk of hearing loss from noise

WHS Regulation section 58

Audiometric testing

Tree work uses noisy machinery such as chainsaws, woodchippers, stump grinders and other plant / machinery.

Workers who are exposed to high noise levels may experience fatigue, stress, headaches and tinnitus (ringing in the ears) that can lead to permanent hearing loss that cannot be cured or improved. High noise levels can make it more difficult for workers to hear sounds, including those that are necessary to work safely, such as verbal instructions and warning signals. Workers who are exposed to noise and vibration together may be more likely to suffer from hearing loss.

PCBUs must manage risks to health and safety relating to hearing loss associated with noise in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation.

PCBUs must ensure workers are not exposed to:

- noise levels of more than 85 dB(A) over eight hours, or
- peak (sudden loud) noises of more than 140 dB(C) which can cause instant damage to hearing.

The risk of causing permanent hearing damage is related to both how loud the noise is and the length of time a person is exposed to it. For example, one minute working in high noise levels such as 112 decibels dB(A) may cause the same amount of damage as eight hours working at 85 dB(A).

Where exposure to high levels of noise cannot be avoided or eliminated, appropriate hearing protection equipment must be provided to all persons who may be exposed to the noise.

A PCBU must provide audiometric testing for a worker who is carrying out work for the business or undertaking if the worker is required to frequently use personal hearing protectors as a control measure for noise that exceeds the exposure standard.

Audiometric testing must be provided within three months of the worker commencing work and regular follow-up tests must be carried out at least every two years.

Further information can be found in the *Code of practice: Managing noise and preventing hearing loss at work.*

13.2 Hazardous manual tasks

WHS Regulation section 60

Managing risks to health and safety

PCBUs must manage risks to health and safety relating to a musculoskeletal disorder associated with a hazardous manual task in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation.

Manual tasks, also known as manual handling, involve using the body to lift, lower, push, pull, carry, or otherwise move, hold, or restrain any person, animal, or thing. Not all manual tasks are hazardous.

A manual task becomes hazardous when one or more of the following risk factors are present:

- repetitive or sustained force,
- high or sudden force,
- repetitive movement,
- sustained or awkward posture,
- vibration.

Tree work may involve some forms of hazardous manual tasks. Injuries can develop gradually over time, with damage becoming apparent suddenly through a particular action that results in back, neck, or shoulder pain. Exposure to hand and arm vibration can occur when using equipment such as chainsaws.

When managing risks associated with manual handling, PCBUs should consider the work environment and implement the following measures:

- plan the job to minimise manual handling by using machinery or equipment (e.g., cranes, bobcats, log rollers, trolleys) and consider reducing vegetation to manageable pieces before handling,
- ensure plant and equipment are ergonomically designed to suit the size, strength, and reach of most users and use mechanical aids and team lifting where practicable to reduce strain,
- rotate workers through different tasks to minimise repetitive movements, awkward postures, or vibration exposure,
- provide adequate breaks appropriate to the tasks and duration of work,
- offer instruction and supervision in safe handling techniques, hazard recognition, and the correct use of equipment and aids.

Further information can be found in the *Code of practice: Hazardous manual masks*.

13.3 Worksite communication and isolated work

WHS Regulation section 48

Remote or isolated work

PCBUs must manage risks to health and safety associated with remote or isolated work in accordance with the hierarchy of control measures set out in Part 3.1 of the WHS Regulation.

Remote work includes tasks performed at a distance from immediate assistance, such as in large trees, along roadside verges, or at the far edge of a worksite.

Isolated work includes situations where a worker is physically separated from other team members and may have limited access to assistance, rescue, or emergency support.

Communication requirements

PCBUs must provide a system of work that includes effective communication with the worker. This should ensure that:

- communication methods are established and agreed upon before work commences,
- the system chosen reflects site-specific conditions, including workplace size, noise levels, weather, and the type of equipment in use,
- workers performing remote or isolated tasks do not work alone wherever reasonably practicable,
- if risks cannot be eliminated, they must be minimised through a safe system of work, including:
    - continuous and effective communication with isolated workers,
    - provision of appropriate communication equipment (e.g., radios, phones),
    - clear protocols for routine check-ins and emergency contact.

For further guidance *Code of practice: Managing the work environment and facilities*.

13.4 Psychosocial hazards

WHS Regulation sections 55A – 55D

Psychosocial risks

Workers can be exposed to a combination of work-related psychosocial hazards and risks factors. A PCBU has a duty to manage the risk of psychosocial hazards in the workplace. A PCBU must eliminate psychosocial risks, or if that is not reasonably practicable, minimise them so far as is reasonably practicable in accordance with the hierarchy of controls.

In determining the control measures to implement to manage the psychosocial hazard, PCBUs must also have regard to all relevant matters including:

- duration, frequency and severity of exposure and how hazards may combine or interact,
- design of work and systems of work,
- design, layout and environmental conditions of the workplace,
- plant, substances and structures at the workplace,
- workplace interactions or behaviours,

- information, training, instruction and supervision given to workers.

Some examples of psychosocial hazards may include:

- role overload (high workloads or job demands), e.g. high levels of physical, mental or emotional effort are needed to do the job,
- hazardous physical working environments, e.g. performing hazardous work, conditions that affect concentration or cause discomfort,
- remote or isolated work, e.g. working alone or in other peoples' homes,
- bullying (repeated and unreasonable behaviour directed towards a worker or a group of workers that creates a risk to health and safety),
- harassment including sexual harassment (which can be single or repeated incidents of forms of harassment by co-workers, clients, visitors or others),

Further information on how to manage psychosocial hazards in the workplace can be found in the *Code of practice: Managing psychosocial hazards at work*. The code provides guidance for identifying and managing psychosocial hazards that can or may pose risks to workers' psychological and, at times, physical health and safety.

13.5 Fatigue

Physical or mental fatigue can reduce a worker's ability to perform tasks safely, increasing the risk of injury or incident. Many tasks in tree work are physically demanding, and heavier tasks, such as lifting and clearing branches, are often left until the end of the day. The term "last cut syndrome" refers to continuing to complete a task despite fatigue, which may be safer to postpone until the worker is rested.

Fatigue may be influenced by:

- lack of sufficient sleep over consecutive days,
- delays, such as bad weather, leading to increased work rate and reduced breaks,
- poor scheduling, including underestimating time required for tasks, resulting in extended work hours,
- inadequate staffing levels,
- emergency work, such as storm response, requiring long or unusual hours,
- extended travel times to remote or isolated sites,
- working in high-heat environments or adverse weather conditions,
- workers attending work unfit due to illness, injury, fatigue, or other personal factors.

PCBUs should consider implementing the following control measures to reduce or manage fatigue:

- work practices that reduce physical effort and strain,
- using plant and machinery to assist with tasks,
- ensuring sufficient workers are available to perform tasks safely,
- using ergonomically designed or better-suited equipment,
- planning work schedules to allow adequate breaks and recovery time,
- providing access to water for hydration and nutritious food,

- monitoring and managing travel times to prevent excessive fatigue before or after work,
- ensuring workers are fit for work and aware of fatigue risks, particularly when operating equipment or performing physically demanding tasks,
- adjusting work practices or schedules in high-heat or extreme environmental conditions.

Further guidance is available in the *Code of practice: Managing the risk of fatigue at work*.

13.6 Hazardous chemicals

WHS Regulation sections 328-388

The use, handling and storage of hazardous chemicals

PCBUs must identify any hazardous substances and dangerous goods used at work and assess the risks. This should be done using information in the Safety Data Sheet (SDS) and on the label.

Some hazardous substances have exposure standards that must be observed. This may be particularly relevant for dust or pesticides that are applied as a spray. Details of any exposure standards are set out in the manufacturer's SDS and the Safe Work Australia Guide: *Workplace exposure standards for airborne contaminants*.

PCBUs have duties regarding dust, pesticides, chemicals and fuels that are classified as hazardous substances or dangerous goods. These include:

- providing and maintaining a register of hazardous chemicals used in the workplace,
- provide SDS to employees who could be exposed to the hazardous chemical – these are obtainable from suppliers and manufacturers,
- train workers on the safe use of each chemical and correct disposal of containers and waste,
- using the chemical in accordance with practices recommended on the label and SDS, including any recommended PPE,
- ensuring that all containers are labelled, including when a chemical is decanted into another container,
- development of effective measures to manage storage, safe use and possible exposure, e.g. site control, training, storage, spill management and ensuring PPE is available,
- keep records of induction and training for workers likely to be exposed to hazardous substances or dangerous goods,
- protection of the health and safety of all people including visitors and the public not directly working with chemicals or fuels.

Further information can be found in the *Code of practice: Managing risks of hazardous chemicals in the workplace* and *Code of practice: Safe use and storage of agricultural and veterinary chemicals*.

13.7 Fire prevention

PCBUs must identify reasonably foreseeable hazards that could give rise to risks to health and safety and manage any such risks. In the context of tree work, the following matters should be considered in relation to fire prevention.

Bushfire and environmental risk

- PCBUs should ensure climatic and environmental conditions that may affect safety are considered, including:
    - fire danger ratings and total fire bans,
    - dry vegetation, high winds, and other local factors that may increase fire risk.
- PCBUs should ensure work is planned and, if necessary, modified or postponed during periods of elevated bushfire risk.
- PCBUs must ensure an emergency management plan is prepared that provides information, training and instruction to relevant workers in relation to implementing emergency procedures. This should include awareness of emergency procedures, escape routes, and communication methods in case of fire.

Petrol-powered equipment and flammable liquids

- Petrol and other flammable liquids should be stored in safety cans or containers designed for flammable liquids.
- Petrol-driven equipment can start fires, particularly in dry vegetation or bushland. Controls include:
    - stopping equipment before refuelling,
    - cleaning up any fuel spillage before restarting equipment,
    - keeping equipment at least three metres away from refuelling areas,
    - prohibiting smoking or open flames near fuel,
    - having fire extinguishers or suppression equipment readily available.
- Workers should be trained in safe handling of flammable liquids and fire prevention procedures.

Further guidance can be found in the *Code of practice: Managing the work environment and facilities* and relevant bushfire safety regulations.

13.8 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
- 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 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.

14. Appendices

14.1 Appendix A - Glossary

Terms used to throughout the Code that require definitions or descriptions.

Term	Description
Anchor point	Any fork formed by the junction of two branches or a branch and the trunk, which can be used safely by a climber as a point for the climbing or lowering rope (natural), or a device installed in a tree to serve as an anchor point; this could include a pulley and sling assembly (artificial).
Aerial rescue	Method used for the removal of an injured worker from an elevated location is the tree or piece of plant, such as an EWP.
Ascender	A knot or mechanical device used for ascending a rope and positioning the climber in the tree.
Back cut	The final release cut made on the opposite side of the trunk to the scarf in a felling operation.
Blocking	The dismantling of the trunk of a tree by the gradual removal of manageable sections, following the removal of the canopy.
Bucking	Sawing a felled tree or limbs into smaller sections; also known as cross cutting.
Chaps	A form of leg protection worn when operating a chainsaw.
Climbing device	Attachment between a climber's harness and the ropes, which allows the climber to ascend or descend.
Climbing rope	Rope used by a climber exclusively for ascending, descending and work positioning.
Climbing spikes	A pair of climbing aids which attach to the climber's lower legs and which are comprised of gaffs or spikes, calf and foot supports, straps and pads.
Competent person	A person who has acquired, through training, qualification or experience, the knowledge and skills to carry out the task.
Cross cutting	Sawing a felled tree or limbs into smaller sections; also known as bucking.

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) an 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.
Descender	A knot or mechanical friction device used in conjunction with a rope to enable descent from a tree in a safe and controlled manner.
Drop zone	Any area in which parts of the tree may be felled or dropped.
Dunnage	Is packing placed under and between a load, to protect and support a load during transportation.
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.
Felling	The bringing down of an entire or section of a tree at ground level.
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.
Industrial rope access	Industrial rope access is a harness-based kernmantle rope system. It incorporates the use of a working rope and a safety rope within the system. The techniques used for Industrial rope access are different to harness based tree climbing techniques.
Kickback	Sudden backward or upward thrust of a chainsaw.
Kickback zone	The upper quadrant of the guide bar nose.
Limbing	Removal of limbs from a fallen tree.
Lowering device	Instrument attached to the base of a tree in rigging, used to take wraps with the lowering rope.
Lowering rope	A rope used by the climber for lowering heavy branches or other parts of the tree. May also be used as a tool line.
May	'May' indicates an optional course of action.
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.
Ordinary person	A person without sufficient training or experience to enable them to avoid the dangers which overhead electric lines and associated electrical apparatus may create.
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.

Term	Description
Pole saw	A chainsaw bar at the end of a telescopic pole which can be hydraulically powered or engine powered. A pole saw can also be hand operated with a toothed saw blade attached to a pole. Can be used from the ground or from an EWP for pruning branches and maybe insulated.
Prusik loop	A climbing device which consists of a loop of rope smaller in diameter than the climbing rope, which is attached to the climbing rope with a prusik knot, and which is used to attach the climber to the climbing rope.
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.
Risk	The possibility harm (death, injury or illness) might occur when exposed to a hazard.
Scarf	Two cuts made to form a notch, which determines the direction of fall when felling or topping, or direction of break when removing a branch.

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.
Shock load	The dynamic load placed on a rope or rigging apparatus when a moving object or falling person is stopped.
Should	'Should' indicates a recommended course of action.
Suspension intolerance	A potentially fatal condition that can occur when a person is suspended upright in a harness without movement for an extended period. Also known as suspension trauma or harness hang syndrome.
Tool lanyard or tool strop	Rope or webbing which attaches the climber's tools to the harness. This should incorporate a tear-away.
Topping	The removal of the upper canopy of a tree performed in one operation by means of felling whilst aloft in the tree.
Trained person	Refers to an individual who has completed an approved training course on working near overhead electric lines conducted by a registered training organisation.
Working load limit	The maximum load that should be applied under general conditions of use to a rope, chain, sling or item of lifting gear. Note: see also the definition of rated capacity.
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.

Term	Description
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.
Work positioning harness	An assembly of a body belt and buttock strap for use as a work-positioning device, and for use where there is likelihood of restrained fall only.
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.
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.

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_40735_26

SafeWork NSW, 92-100 Donnison Street, Gosford NSW 2250
Locked Bag 2906, Lisarow NSW 2252
Website **www.safework.nsw.gov.au**