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1.0 Work Site Planning

Aerial tree work operations must be effectively planned, organised and carried out to minimise adverse effects on anyone doing the work, anyone potentially affected by the work, the trees, and the site and its surroundings. Take the following measures in order to ensure the work is carried out efficiently and with minimum impact on people and the environment.

- a. Allocate sufficient personnel, time and equipment to ensure the work can be carried out safely and efficiently in accordance with agreed work specifications.
- b. Carry out a suitable and sufficient risk assessment. It should include a comprehensive emergency action and aerial rescue plan. The competent person on site must ensure that all other operators understand and have digested the site-specific risk assessment.
- c. Plan and agree access, egress and parking arrangements for the site, including how they will be monitored and enforced.
- d. Site and operate equipment, in particular machinery, in a way that avoids damage to trees or other property, e.g. temporary ground protection could be used.
- e. Designate areas for the storage and maintenance of equipment and materials, particularly chemicals and fuel.
- f. Operators should zone the work site to ensure the extent and boundaries of drop zones, work zones and buffer zones are clear.
- g. Take care to avoid contamination or disruption of the ground or water courses, e.g. by oil or chemicals.
- h. Minimise dust, noise and other nuisance caused by tree work operations.
- i. Install warning and prohibition signs on all foreseeable approaches to the site to indicate a hazardous work site and to prohibit unauthorised access. In areas of high public access, a risk assessment may indicate that additional controls, e.g. barrier tape, barriers or extra personnel, are required.
- j. Operators must agree on the method of communication they will use on site. The selected method must be effective over the ambient noise levels.

Insert image of a worksite laid out correctly, highlighted all the points for consideration e.g. Access, fuel storage etc. overlaid with the demarcation of site zones.

2.0 General Information

- 2.1 All operators carrying out pruning must understand that any work they do will have both positive and negative effects, and often those effects will only become clear over a number of years in the lifecycle of the tree.
- 2.2 The standards expected in a pruning operation must include that it:
 - a. follows a specification that can be achieved safely by working from rope and harness and/or other access means;
 - b. includes no tears or overcuts and leaves no scars; and
 - c. includes the use of natural target pruning unless otherwise specified.

3.0 Standard of Finished Work

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Any tree work and the resulting finished “product” must at the very least meet the minimum standard set by a relevant authority. Everyone involved must understand that any pruning work will have a direct and lasting effect on the health and lifecycle of the tree. Therefore, all work must be appropriately specified and carried out to avoid unnecessary damage to the health of the tree.

4.0 Work Operations

- 4.1 A competent person should prepare a work specification based on the results of a survey or inspection, and/or on the client’s objectives (the brief). It should include the details of the tree work and the purpose of each aspect of the work in relation to the objectives. Make the reason for each specified task clear to the operators involved.
- 4.2 The work specification should also include:
- an unambiguous identification of the tree(s), e.g. on a site plan and/or by reference to marking, photos or tagging on site;
 - clear details of how arisings will be disposed of or used; and
 - any limitations on the execution of the work, with provision for specific contingencies. For example, it should set out that if bats or nesting birds are found during the course of scheduled work, the work should be stopped and the discovery should be reported to the client and, if necessary, to the relevant statutory body.
- 4.3 The specification should be designed to minimise adverse effects on the tree, in particular any avoidable development of biomechanical weakness.
- 4.4 There must be recognition that on occasions the client or tree owner’s brief (‘management objectives’) may contravene what arborists and arboriculturists know as ‘ideal pruning techniques’, despite advice to the contrary. Operators must therefore ensure they are clear on the scope of work to be carried out, referring back to the competent person if in any doubt.

5.0 Wildlife Considerations

Wildlife must be considered before work starts. Carrying out tree work can have significant adverse effects on wildlife and habitat. In some cases, it may be a requirement to record that a wildlife assessment has taken place before work begins. Even if this is not a stipulation, it is still good practice to identify all the potential effects of the planned work on wildlife.

6.0 Timing

- 6.1 The timing and extent of pruning (especially the number and size of wounds) should be determined by both the management objectives and an assessment of the likely effects on the tree and its surroundings. The assessment should take account of the species' tolerances, the tree's age and condition and any implications for the safety of other trees.
- 6.2 Wherever feasible, avoid pruning at times when the disease- and decay-resistance of the tree is likely to be impaired by physiological stress induced by previous tree work, construction damage, or seasonal or weather-related factors, e.g. during or soon after a drought or when starch reserves have been depleted by spring flushing and flowering.

7.0 Transmission of Pests and Pathogens

- 7.1 Exercise extreme caution to prevent the introduction or spread of pests and pathogens. Take measures to avoid the transmission of pests and pathogens from tree to tree and from site to site.
- 7.2 Chainsaws are a common cause of transmission. Use hand tools (where practicable) when working on trees infected with pathogens so that disinfection to be carried out effectively.
- 7.3 In the case of particularly high-risk pathogens, disinfect anything that might come into contact with another tree (e.g. tools, hands, clothing, personal protective equipment [PPE]). When disinfecting PPE and climbing/rigging equipment, take the manufacturer's guidance into account to avoid degradation of the equipment.

Insert image to show operator carrying out disinfectant/cleaning of tools and equipment

8.0 Tree Condition Assessment

- 8.1 The operator must carry out a tree condition assessment for aerial tree work in accordance with published industry guidance.
- 8.2 Avoid any pruning that would adversely affect the structural integrity and sustained growth of the subject tree or neighbouring trees.
- 8.3 In order to ensure that the tree has sufficient energy and is not so impaired that it cannot resist disease and decay, keep the removal of leaf-bearing twig structure and the size and frequency of pruning cuts to the minimum required to achieve the desired results.
- 8.4 Keep the surface area of the pruning cuts – both individually and collectively – to a minimum.
- 8.5 The tree condition assessment may have a direct impact on what work can be completed, and it may mean the work specification has to change or work has to stop. Any changes to the work specification should be agreed by all parties before proceeding.

9.0 Work Equipment

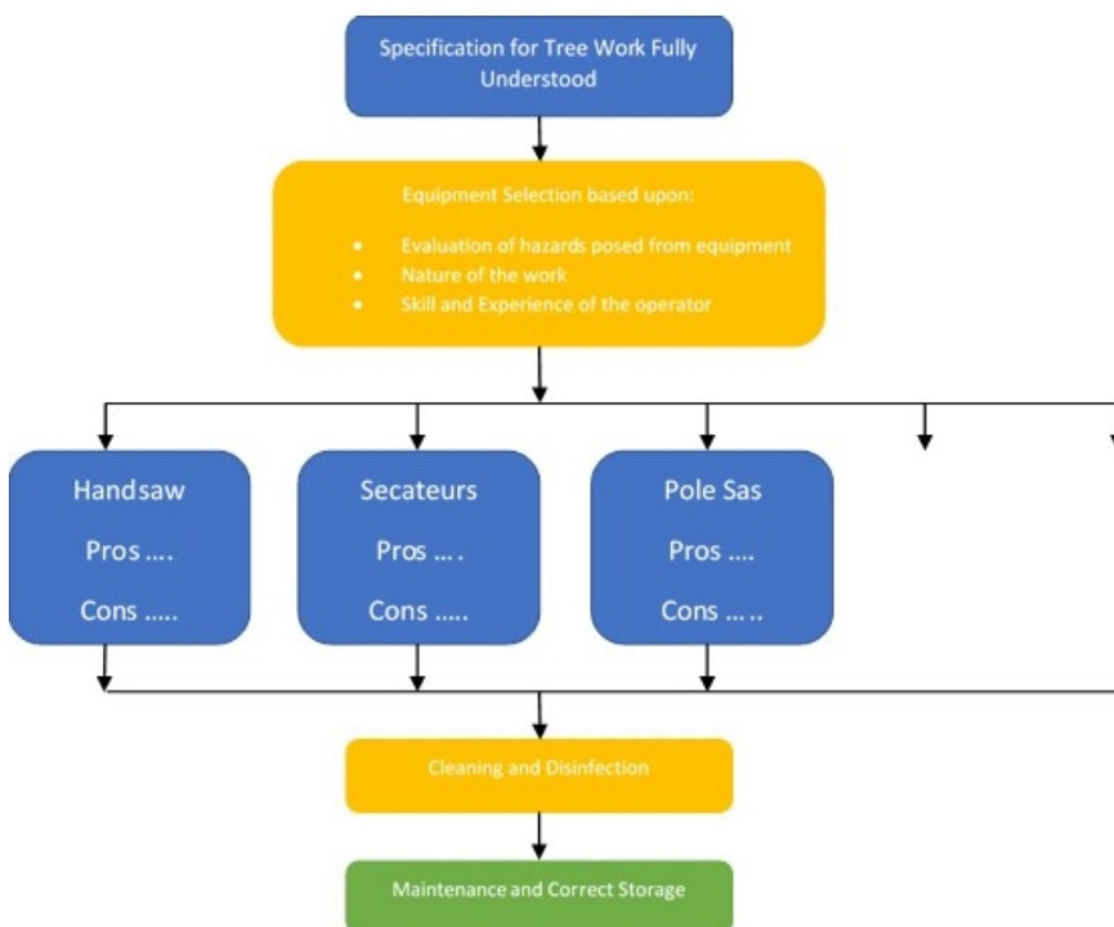
9.1 General Advice

Select and operate work equipment only after due consideration of where and how it will be used. All operators must have the knowledge, ability, training and experience necessary to use the equipment safely.

9.2 Equipment Selection

Select equipment using a staged approach which gives preference to hand tools over powered tools. Hand tools frequently provide a lower risk alternative to powered tools and have ergonomic benefits associated with lighter equipment and possibly lighter and more ergonomic PPE.

An operator should always be able to justify their equipment selection.



9.3 Hand Tools

Hand tools can provide an operator with a cutting option where a powered tool either presents too great a risk or other site- and task-specific considerations prevent its use.

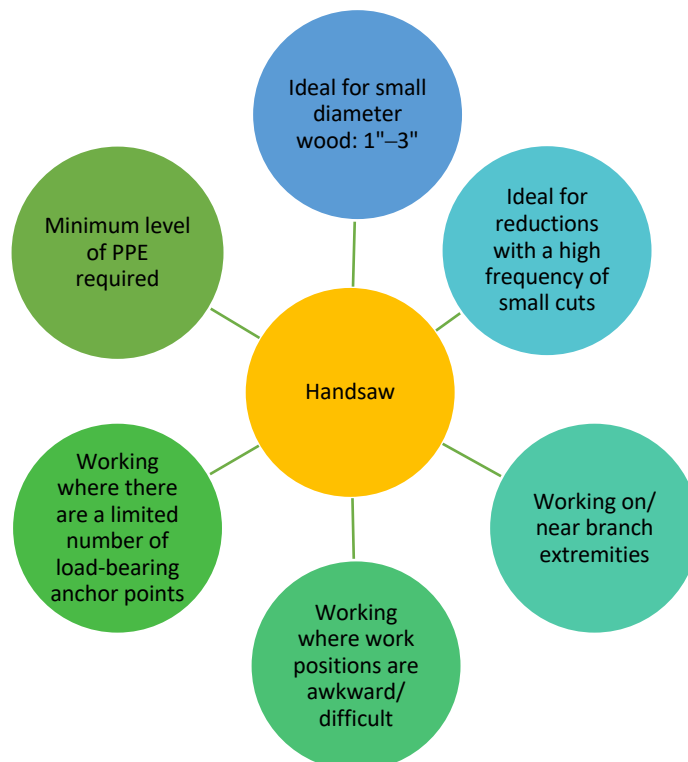
Operators should know the limitations of the hand tools available and therefore be able to select the most appropriate tool for the task.

The following pictograms illustrate some of the issues to take into account when selecting a tool. However, there will always be exceptions to the suggestions listed, e.g. where the user instructions accompanying the tool specify cutting diameters greater or smaller than those set out below.

Handsaws

Handsaws come in a wide variety of lengths, blade profiles and tooth configurations, making them a versatile tool capable of dealing with numerous cutting tasks. Some operators may choose to use (larger) handsaws for cutting tasks which would also be suited to a chainsaw.

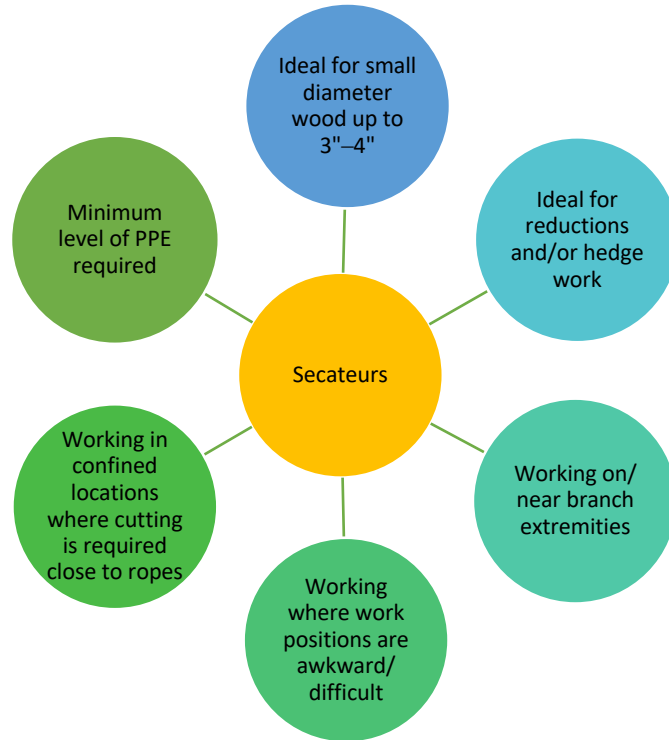
Insert image of different styles of handsaw e.g. straight blade, curved blade, folding, tight tooth sequence



Secateurs

Secateurs can provide a one-handed pruning solution where very small diameter material is to be cut and the finish needs to be accurate and clean. They are available in a variety of configurations offering bypass/anvil blades, ratchet mechanisms (for larger diameter material) and rotating heads to allow for ergonomic cutting positions.

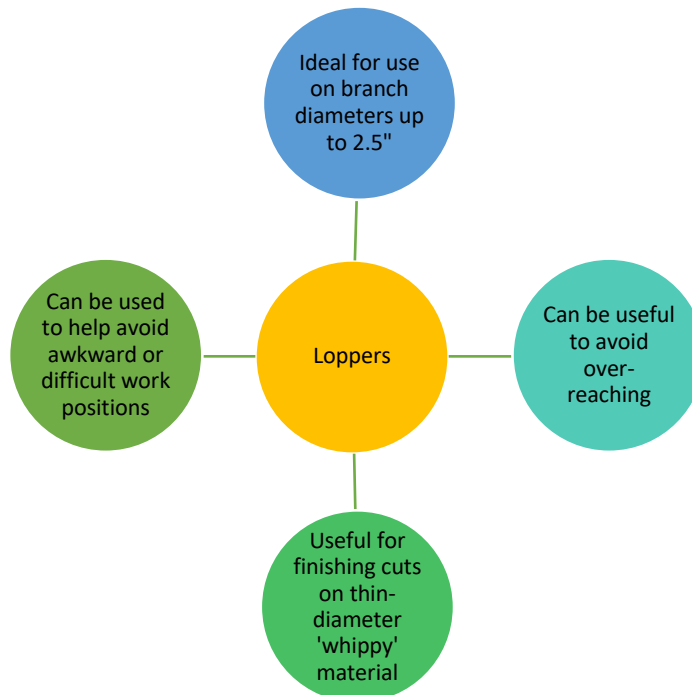
Insert image of different secateurs styles – bypass, anvil, ratchet, rotating head



Loppers

Loppers can provide a relatively versatile cutting option where an operator needs to have an extended reach. Loppers come in a range of different configurations similar to those of secateurs but with the added benefit of greater reach and a larger cutting capacity.

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Insert image of different lopper styles similar to those of secateurs

9.4 Pole-based equipment

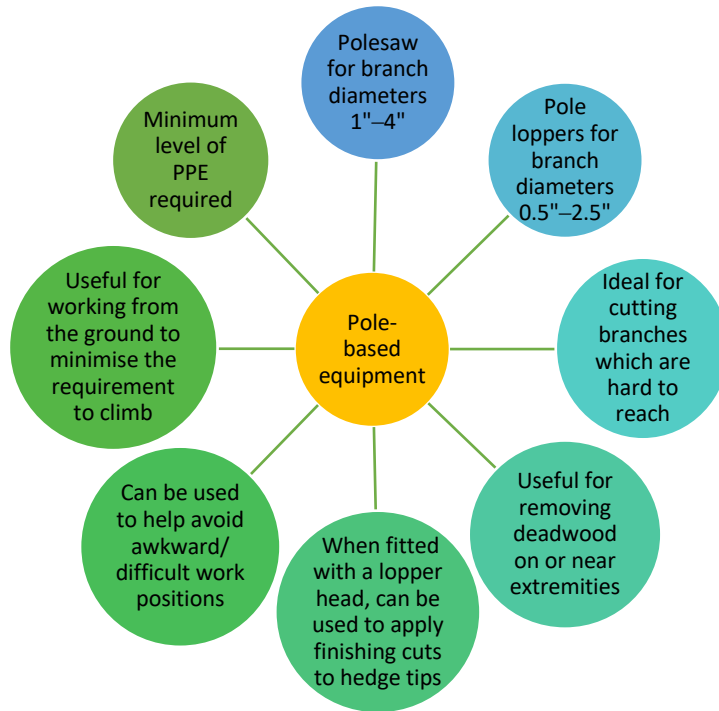
Pole-based equipment can provide an operator with pruning and/or cutting options which are not available with shorter equipment.

Pole-based tools come with pruning saw heads, lopper-type heads, or even hooks for the removal of dead or hanging branches.

Insert image an operator using pole-based equipment e.g. lopper head, saw, hook

Here are some points to consider when selecting a pole-based tool:

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9.5 Battery-operated equipment

9.5.1 Battery-operated machinery provides an operator with a lightweight, low maintenance alternative to traditional engine-driven machinery. Offering tangible reductions in vibration and noise emissions compared to using an engine-driven machine, it has clear health benefits for operators.

Advantages	Disadvantages
<ul style="list-style-type: none"> ▪ Lightweight, reducing the potential impact on the operator’s body ▪ Lower emissions ▪ Lower maintenance ▪ Lower running costs ▪ Precise cutting and handling because of chain pitch and profile 	<ul style="list-style-type: none"> ▪ Higher purchase cost than equivalent-sized engine-driven machinery ▪ Batteries require recharging ▪ Limited availability in larger chainsaw size range ▪ Design features may include no universal on/off system, resulting in an almost constant “live” status ▪ Weather conditions may limit when battery-powered machine can be used ▪ Ground staff used to hearing chainsaws start prior to cutting have no passive audible warning that branches are about to be cut, and must rely on active voice signals from the climber or a visual line of sight at all times to avoid entering the drop zone ▪ Because equipment is quieter ground staff may not be as observant when the machine is running

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9.5.2 The operator is responsible for ensuring that:

- a. battery-powered machinery is operated in accordance with good practice relating to the machine type;
- b. user instructions are followed relating to battery care, charging, storage and disposal;
- c. PPE is worn; and
- d. batteries are removed before the equipment is subject to maintenance, transported or stored.

9.6 Alkylate Petrol

Alkylate petrols are often pre-mixed with a premium quality biodegradable 2-stroke oil, suitable for chainsaws, clearing saws, hedge trimmers, power cutters and other land-based 2-stroke engines.

These fuels are virtually free from harmful substances such as benzene, aromatic hydrocarbons or olefins – substances that can cause serious health problems. Alkylate petrol also keeps the spark plugs and combustion chamber of a machine cleaner. It contains no ethanol, which means it can be stored for a long time without any deterioration in quality, making an engine easy to start even after long standstill periods.

10.0 Inspection and Maintenance of Work Equipment

10.1 Only use a chainsaw if:

- a. the stop switch works and is clearly marked;
- b. the front hand guard/chain brake, chain catcher and anti-vibration mounts are undamaged and functional;
- c. where fitted the throttle opens only when the throttle lock is depressed;
- d. it is fitted with a reduced chain designed to reduce kickback;
- e. where applicable the exhaust system and silencer are in good order;
- f. there is a means of attaching a suitably rated or tear-away lanyard to the rear of the saw; and
- g. there is a mandatory hearing protection symbol on the saw.

10.2 In addition to ensuring the chainsaw has adequate and intact safety features, check it over to confirm that the casings are assembled properly and the fixing screws and nuts are adequately tensioned. Sharpen and correctly tension the saw chain and make sure it runs freely along the bar for its entire length. The bar and chain should not show signs of excessive wear or overheating, and the starter cord should be properly tensioned and in good condition.

10.3 A operator holding a petrol driven chainsaw should stand up with the chain brake on, and then roll the saw from side to side and swing it gently by its lanyard to ensure that it ticks over properly whilst hanging upside down as it would from a climber's harness

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10.4 Ensure maintenance is carried out as specified in the manufacturer's handbook.

Follow a maintenance checklist, for example:

- a. maintain equal cutter lengths, specified cutter angles and depth gauge profiles. Inspect the chain at each sharpening for abnormal wear patterns and damage;
- b. check the guide bar rails for burrs, cracks and distortion;
- c. check the drive sprocket periodically for excessive wear or damage;
- d. do not make any adjustments, other than to the carburettor (where fitted), when the engine is running;
- e. inspect the anti-vibration rubbers frequently and replace as specified in the manufacturer's handbook; and
- f. use only recommended cleaners. Do not use petrol to clean any part of the machine.

10.5 Do not delay in reporting any defects. If necessary, take the saw out of operational use. Replace faulty parts with manufacturer's recommended parts.

11.0 PPE Selection for Cutting Tools

11.1 While no PPE can provide 100% protection against cuts, operators must wear the following:

PPE requirements		
Chainsaw	Handsaw	Loppers Secateurs
<ul style="list-style-type: none"> ▪ A safety helmet ▪ Eye protection ▪ Hearing protection ▪ Gloves appropriate to the task and subject to the operator's risk assessment ▪ Leg protection and groin protection ▪ Protective boots with good grip and protective guarding at front vamp and instep ▪ Non-snag outer clothing 	<ul style="list-style-type: none"> Gloves Eye protection 	<ul style="list-style-type: none"> Gloves Eye protection

Insert image of operators dressed in appropriate PPE for type of cutting equipment to be used.

11.2 Ensure chainsaw-specific PPE containing blocking material has been manufactured in accordance with the relevant standard and carries a mark attesting to this.

11.3 Subject to the operation and the equipment being used, operators should choose gloves with an element of cut resistance. In some cases, cut-resistant gloves may not offer the best grip

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for handling ropes, and so an operator who is climbing may opt not to use them in favour of better rope grip.

- 11.4 High-visibility clothing may also be appropriate, subject to risk assessment.
- 11.5 Use Type C chainsaw trousers (all round protection) when operating a chainsaw in the tree.
- 11.6 In circumstances where the use of Type C chainsaw trousers could cause heat stress or ergonomic issues, operators must adopt an alternative approach to the planned work.

Factors to consider in deciding whether to follow alternative working methods include:

- a. Does the job have to be done there and then? Can it wait until daytime temperatures are cooler?
 - b. Can the system of work be altered to reduce the number of cuts to be made by an operator, or can a handsaw be used instead of a chainsaw?
 - c. Can the workload be shared amongst operators?
- 11.7 As a minimum, everyone on site should carry a personal first-aid kit incorporating a large wound dressing, barrier gloves, plasters, and a tourniquet/clotting haemostatics.
 - 11.8 Hand-cleaning material, such as waterless skin cleanser or soap, water and paper towels, should be readily available.

12.0 Preparation of Tools

12.1 Preparation of Hand Tools

- 12.1.1 Ensure hand tools are, where applicable, stored and carried in a protective sheath and kept sharp to maintain optimum cutting performance. Any method for carrying the tool and attaching it to the harness must be secure and configured to prevent accidental release or dropping.

12.2 Fuelling and Checking Powered Tools

- 12.2.1 Petrol vapour is invisible and can travel considerable distances from spillage or fuelling sites. Always maintain a safe distance between the fuel storage/fuelling station and all sources of ignition, such as fires, people smoking or the chainsaw. The location of the fuel storage/fuelling station must be selected with this consideration in mind. Choosing the location must be part of the initial site planning process. Select a location shaded from direct sunlight.
- 12.2.2 Use fuel containers with a non-spill spout specifically designed for chainsaw use. The containers must be clearly labelled and must have securely fitting caps.

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- 12.2.3 Fuel vapour can become pressurised in sealed containers because of temperature changes, which can result in rapid expulsion of fuel and vapour when chainsaws are filled. Be aware of this potential danger and use a safe method to release the pressure prior to fuelling.
- 12.2.4 Replace all fuel and oil caps securely. Make sure the 'O' ring seals on the fuel cap and that oil caps are in good condition.
- 12.2.5 Move a safe distance (normally at least 4m) from the fuelling point before starting the chainsaw.
- 12.2.6 Before passing the saw up to the climber, ground staff should check the following functions:
- Is oil delivery to the chain okay?
 - Is the chain brake working?
 - Is the chain stationary when idle?
 - Does the saw continue to run in its full range of working positions?
 - Is the on/off switch working?
 - Is the chain tension okay?

13.0 Equipment Hauling

13.1 General Precautions

- 13.1.2 Take steps to prevent the accidental release of any material or object during hauling. Where this is not reasonably practicable, put measures in place to prevent a person (or object) being struck by falling items. These measures could include marking out the work site to identify specific danger zones below where items are to be hauled.
- 13.1.2 Take measures to ensure that only operators with a full understanding of the hazards associated with hauling equipment can enter an active work site and danger zones associated with the task.

Such measures may include:

- a. signs and guards on all reasonably foreseeable approaches to the site;
 - b. demarcated areas which operators should either (i) never enter, or (ii) only enter following clear direction and instruction from the climber;
 - c. the use of a banks person or lookout as required; and
 - d. an effective communication strategy between operators, ensuring clear, unambiguous warnings are given prior to hauling.
- 13.1.3 Adopt the following practices to ensure the continuing safety of hauling operations:
- a. No individual should stand or work beneath a suspended load. It is the responsibility of both the climber and the ground staff to ensure this does not occur.
 - b. If he/she is using the climber's line, the ground-based operator should step away once the aerial operator has begun the hauling process.

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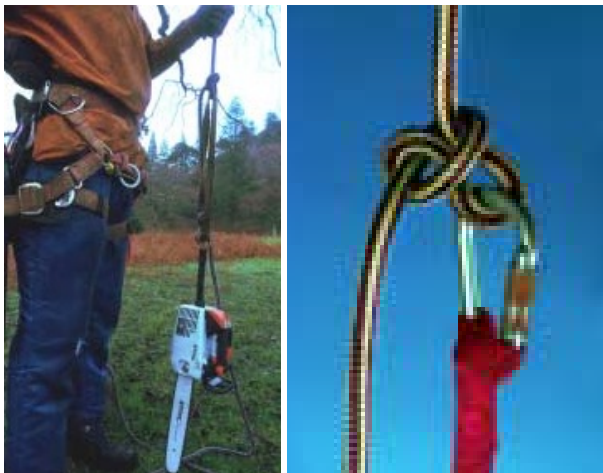
- c. Ground staff tasked with hauling equipment must ensure they fully understand their role, including at what point to release any element of the system.
- d. Climbers must provide clear guidance to ground staff when any part of the haul system is to be released. This is especially relevant at the end of an operation using the climber's line, when the aerial operator has secured the equipment to their harness and releases the haul rope.
- e. Climbers should monitor any lifting procedures, being ready to act if the hauling system fails or control is lost.

13.1.4 Equipment with known loading parameters may be used to haul tools into the tree. Such equipment – for example, a chainsaw lanyard – must be free from material defect and suitable for the task. Equipment designed to lift a load must be subject to thorough examination at suitable intervals.

13.2 Hauling Powered Equipment

13.2.1 Whenever a chainsaw is to be sent to a climber, the chain brake must be applied. A snap or karabiner on the saw's strop should then be clipped into the loop and the saw hoisted up by the climber.

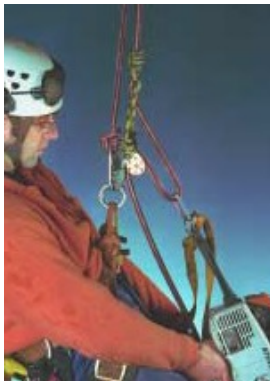
13.2.2 The most common method of sending a saw aloft is by attaching the climber's rope to the saw's strop at chest height using a marlinespike hitch tied in the climber's lifeline. Take care not to tie a slipped-hitch as this can pull through, either because of the weight of the saw or because the saw becomes jammed in branches, particularly if the knot is tied close to the end of the rope.



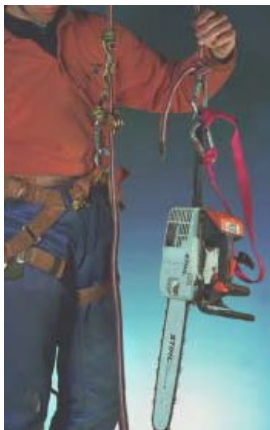
13.2.3 Alternatively, the saw can be tied on to the climber's lifeline via its front or top handle with a double figure-of-eight knot.

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13.2.4 A fast, ergonomic and safe hauling technique can be applied using any friction hitch incorporating a micro-pulley.



13.2.5 Using the operator's own friction hitch and securing a chainsaw to the end of the lifeline, the saw can be pulled up totally secured from a fall.

**13.3 Hauling Handsaws, Loppers and Poles**

Whatever method of hauling is chosen, ensure the tool cannot become detached from the hauling line during the transfer from the ground to the operator in the tree.

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Often the most secure and easiest way to attach a tool of this type to the line is to fasten a sewn tape sling to the tool and connect it to the hauling rope with a locking connector into a midline loop.

Insert image of ways to secure the equipment to the tool line.

If the operator opts not to attach the tool using a sewn tape sling then it is possible to form a connection to the hauling rope by creating a midline attachment such as a clove hitch or a marlinespike hitch and sliding the tool through the loop and “cinching” it down to prevent slipping.

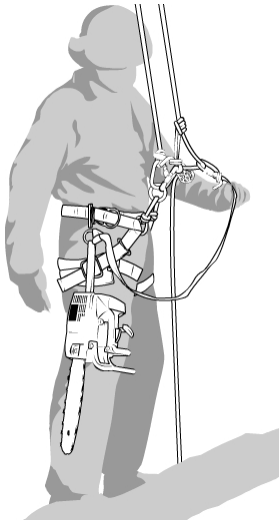
Insert image of attaching equipment directly to the line.

14.0 Securing, Carrying and Storing Equipment while Working in the Tree

14.1 Securing and Carrying a Chainsaw

- 14.1.1 The chainsaw should be attached to the climber’s harness by a suitably rated tear-away or anti-shock lanyard.
- 14.1.2 Determine the correct lanyard rating for the task by considering the following factors:
 - a. the weight of the saw;
 - b. whether a requirement exists for the lanyard to break; and
 - c. the proximity of workers beneath.
- 14.1.3 Tear-away or anti-shock lanyards allow for energy dissipation if, for example, the chainsaw gets trapped in the branch or trunk section being removed. This energy dissipation reduces the loads on the climber’s harness, personal fall protection system and anchor points to a safe level.
- 14.1.4 A method of clipping the chainsaw high up should be integral to the design of the lanyard. This will ease movement through the tree and help prevent damage to the tree or saw during climbing operations.

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- 14.1.5 Equipment must only be attached to the harness at approved positions with known load-bearing capabilities, e.g. gear loops or rear attachment point.
- 14.1.6 During long periods of work or when using larger saws, operators may prefer to hang work equipment, in particular chainsaws, from the central pelvic attachment point.
- 14.1.7 After receiving the chainsaw from ground staff, the climber should attach the lanyard to their harness before disconnecting it from the line. This reduces the chance of dropping the chainsaw as it is transferred from the line to the harness.
- 14.1.8 It may be useful to attach the chainsaw to a suitable anchor point centrally in the tree when pruning predominantly with hand tools. The chainsaw can then be retrieved and used on larger-diameter cuts as needed.

14.2 Securing and Storing Handsaws and Secateurs

- 14.2.1 Handsaws and secateurs must always be kept in a sheath to prevent accidental contact with the blade/s. The sheath must be the right size, covering the whole blade/s, and must hold the tool securely to stop it falling out if the sheath is inverted.
- 14.2.2 The sheath can be stored on the harness, attached to an appropriate tool attachment point or to a specifically designed leg scabbard.
- 14.2.3 Install the sheath in a position which allows access to the tool unimpeded by other work equipment or PPE such as ropes or lanyards, and which allows favourable access by the dominant hand and also to protect vulnerable textiles when it is both drawn from and returned to the sheath.
- 14.2.4 Take care to avoid the scabbard getting blocked with sawdust and debris. This could prevent the tool from fully returning to the scabbard, which risks cut injury or the blade falling out when the scabbard is inverted. (photo with cross through?)

Insert image of operator having a scabbard positioned on their harness, and leg scabbard.
 Image to highlight the importance of equipment organisation on the back/side of the harness.

14.3 Securing and Storing Loppers

Because of the configuration of most loppers, it can be difficult to store them on a harness in a way that prevents accidental contact with the blades and stops the arms opening.

If the loppers come with a sheath to cover the blades, leave this on while they are stored on the harness. If there is no sheath, orientate the loppers on the harness in a way that limits the risk of contact with the blades, e.g. hung by a sewn tape sling attached to the arms.



Indicative image above – to be replaced.

14.4 Securing and Storing Pole-based Equipment

Pole-based equipment is often unwieldy and difficult to carry in the tree. Planning ahead will avoid the need for poles to be hung unsecured on the harness or in the tree.

When the pole is held in the harness, secure it by a sewn tape sling or similar device which grips the shaft securely. If the pole has a saw head attached, a scabbard should cover the blade to prevent accidental contact.

If the pole has a lopper-type head which uses a pulley mechanism activated by a cord, the cord can become tangled. To avoid this, the cord could be stowed in a bag or pouch, wrapped around the shaft of the pole or coiled up neatly near the head.

Insert images showing poles attached to the line, attached to the harness and attached to the tree, include pull cord storage e.g. daisy chained or in a ditty bag.

15.0 Safe Starting Procedures: Chainsaw

- 15.1 Cold start: Place the saw on the ground with the left hand on the front handle and the right knee on the rear of the control handle. Apply the chain brake, engage the starter mechanism and pull the starter cord firmly with the right hand. Release the half throttle mechanism as soon as the saw has started.

Insert image of operator with ear and eye protection during the starting procedure.



- 15.2 If conditions prevent a ground start, the saw can be started using the thigh start, but beware of excess heat if the saw has a side exhaust outlet. Alternatively, the saw can be started with the right hand on the control handle. Apply the chain brake, engage the starter mechanism and pull the starter cord firmly with the left hand.



- 15.3 Before restarting the chainsaw in the tree, ensure that the saw chain is clear of obstructions such as climbing equipment, protective clothing or parts of the tree.
- 15.4 To restart the chainsaw in the tree, first apply the chain brake:
Then start the saw either:
- by holding the front handle with the left hand and pulling the starter cord with the right hand; or

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- b. by holding the saw with the right hand on the control handle and pulling the starter cord with the left hand.

15.5 **N.B. It is important that during the start procedure outlined in 15.4 b, that the throttle is not depressed as the saw is started.**



16.0 Work Positioning: General Handling

- 16.1 Top-handled chainsaws must be controlled using both handles whenever possible. One-handed use is only for use in exceptional circumstances.
- 16.2 The saw should always be clear of the operator and the climbing equipment. If it becomes apparent that a cut may need to be made in close proximity to the operator or climbing equipment, an alternative work position must be achieved, or a handsaw must be used.
- 16.3 Achieve the best available cutting position to minimise the risk of being struck by the saw (particularly in the event of kickback or runback), or by severed pieces of wood.
- 16.4 On horizontal sections, hold the saw at hip level in front of the body.

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- 16.5 On vertical sections, it is often most comfortable to cut with the chainsaw held between waist and chest height. Chainsaws must not be used above chest height.
- 16.6 Horizontal cutting. When a pole is 'step-cut', it is advantageous for the cuts to be made at right angles to the body in order to reduce the risk of cutting towards the body or kickback/runback pushing the saw into contact with the operator.

Insert image of cutting at 90* to the body on a vertical stem.



Image showing incorrect stance.

- 16.7 A climber may prefer to use the chainsaw left-handed in order to achieve a comfortable and secure work position, this may be particularly advantageous when working with larger rear-handled chainsaws.
- 16.8 There will be occasions when the preferred work method is to hand-cast or hand-assist sections. On some species, the use of kerf cuts into the sapwood may help to reduce the risk of the section tearing along the cambium layer and possibly causing loss of control and/or injury to the climber. Hand-held sections should be cut into easily manageable chunks.

Insert image of kerf-cuts on the side of a sink

- 16.9 If there is a risk of the chainsaw getting trapped or being taken with a severed section, put in place suitable control measures to minimise that risk. Such measures could include:
- a. removing the section in smaller pieces;
 - b. adopting an alternative cutting strategy such as the use of inboard rather than outboard cuts;
 - c. using tear-away or anti-shock lanyards to reduce any potential dynamic loads within the system; and
 - d. avoiding free-fall techniques, opting instead for a suitably planned and managed rigging operation or crane lift.

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- 16.10 Do not leave the engine running for long periods when the chainsaw is not in use. The chainsaw should not be left ticking over when it is hanging in the tree or clipped high on the harness.
- 16.11 Whilst the chainbrake does not need to be applied directly between two cuts being made e.g whilst completing an under and top cut. It should be applied when moving work position.

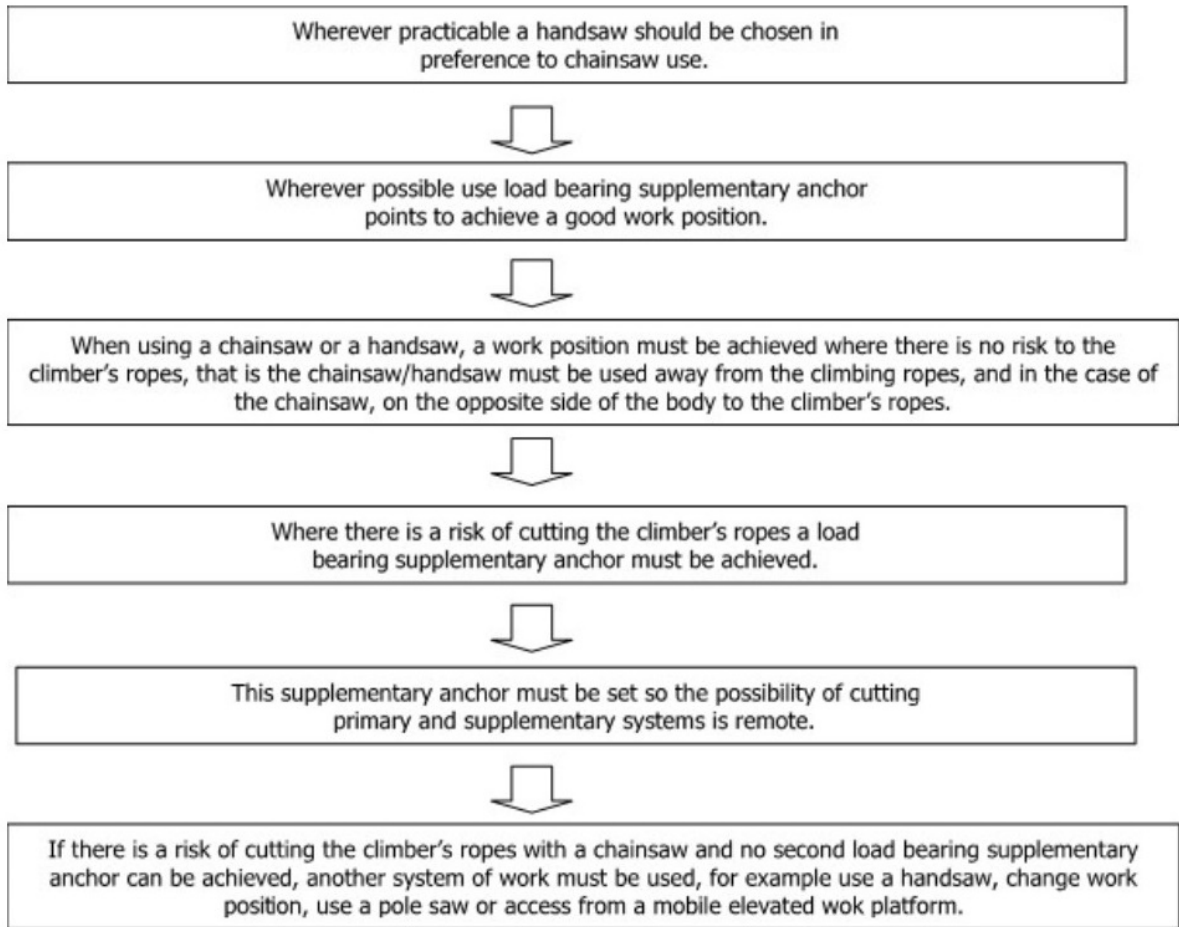
17.0 Use of Supplementary Anchor Points

- 17.1 Load-bearing and non-loading-bearing supplementary anchor points can be used to provide additional support and stability and to help reduce the potential of a pendulum swing.
- 17.2 Use load-bearing supplementary anchor points wherever reasonably practicable to achieve and maintain appropriate work positions.
- 17.3 A load-bearing supplementary anchor point serves to:
- a. help prevent or limit an uncontrolled pendulum swing;
 - b. provide a back-up to the main climbing line when there is a risk of severing it; and
 - c. provide a back-up should the main anchor point fail.
- 17.4 Establish a load-bearing supplementary anchor before starting the chainsaw.
- 17.5 Unless the use of a second system would entail a higher risk to the operator, always use a load-bearing supplementary anchor when operating a chainsaw.

18.0 Risk Hierarchy

The risk hierarchy below provides guidance on safety considerations relating to using tools in the tree and reinforces the need to use load-bearing supplementary anchor points wherever practicable.

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19.0 Chainsaw Use

- 19.1 Operators **MUST NOT 'cut and hold'** a section or reach over a running chain in an attempt to control a section when it breaks free.

Insert image of cutting and holding

- 19.2 Inappropriate and/or incorrect one-handed chainsaw use significantly increases the risk of injury from the saw if it kicks back, skates or bounces on contact with a branch, or drops through at the end of a cut.
- 19.3 One-handed chainsaw use should be restricted to circumstances where a hand is required to maintain a stable working position and the saw is used at extended reach with the other hand, e.g. while cutting at the extremities of limbs.
- 19.4 Top-handled chainsaws should not be used one-handed in place of good work positioning.

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19.5 In a situation where one-handed chainsaw use is a more suitable and efficient choice because cutting two-handed would mean working in a difficult position and at full stretch, consider the following:

- Carefully select work positions to ensure that no part of the body comes within the arc of the saw once the cut has been completed.
- Achieve a work position which is “braced” against the inertia of the saw whilst cutting, i.e. using the rest of the body to stabilise yourself
- Can the cut be started with a chainsaw and finished with a handsaw to reduce the exposure to one-handed chainsaw use?



Insert image of appropriate one-handed cutting technique

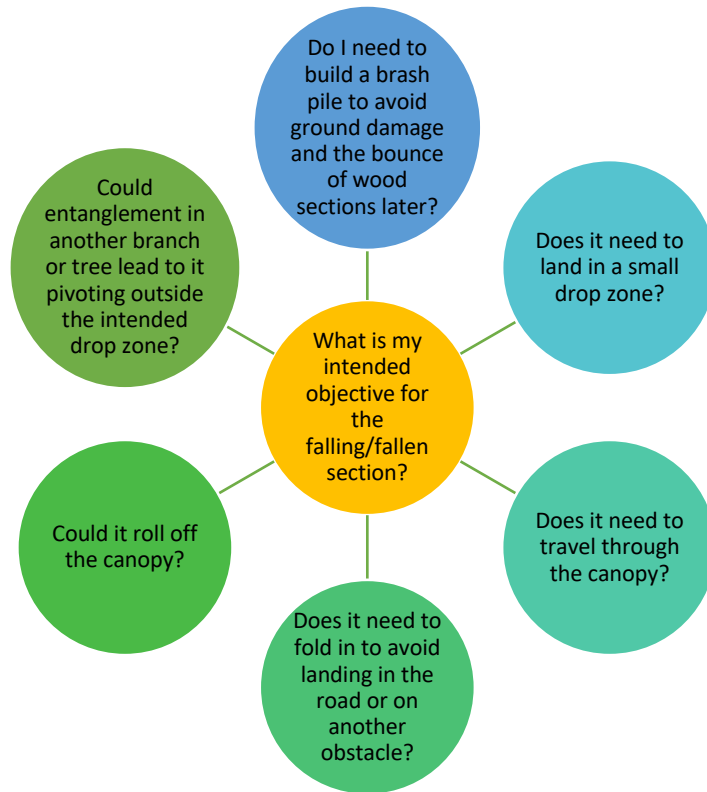
20.0 Cutting Methods

20.1 General

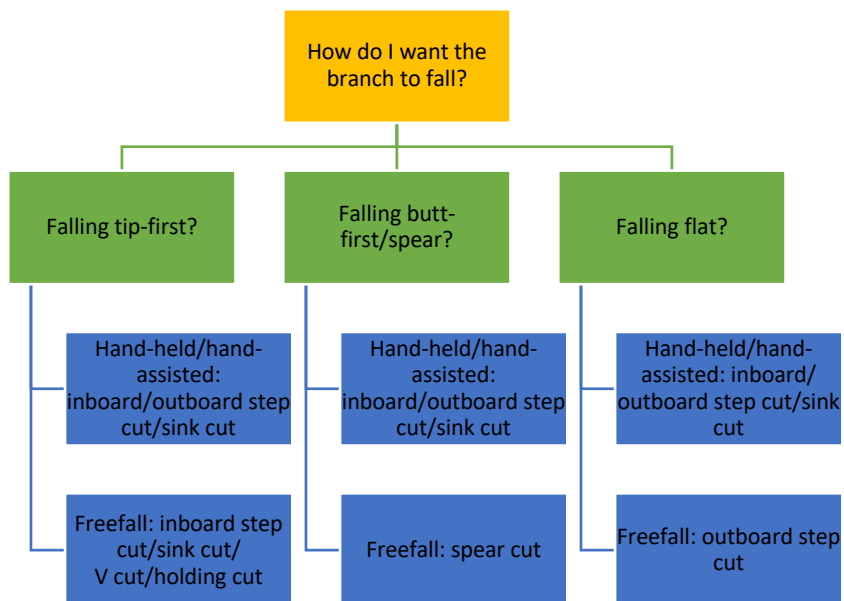
All operators must understand that the chosen cutting method will affect the way in which the branch will fall from the tree and hit the ground. The branch will not always fall ‘cleanly’, it may strike other branches or obstacles as it falls. Consider this when selecting the most appropriate cutting method.

Some points to take into account prior to cutting are set out below:

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The pictogram below is intended only as a guide and is not exhaustive. Before cutting, operators should be aware of the timber characteristics and weight of the intended section, as well as the wind speed and direction, as these factors will influence the fall direction and rotation of the falling section.



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NB. Rigging techniques can negate the need for so many cuts, especially on limb extremities where opportunities for safe positioning may be limited and pendulum swing potential increased.

20.2 Examples of Possible Cutting Techniques

20.2.1 The following cutting techniques can be used to remove branches. The choice of technique will depend upon the cutting tool used and the desired outcome. The cuts may be either hand-held/hand-assisted or free-fall, although some cuts may be better suited to one technique rather than another.

Hand-held/hand-assisted sections: Cuts are made and then the section being removed is broken free by hand. This technique is usually used on smaller, lighter sections of timber which can be physically manipulated by the operator.

Free-fall sections: The weight of the section will cause the cut to break and the section to fall unaided to the ground, without the operator having to manipulate it.

20.2.2 Horizontal or near horizontal timber:

- Step cut (outboard undercut)
Insert image
- Step cut (vertical side cuts)
Insert image
- Sink cut
Insert image

20.2.3 Vertical timber:

Hand-held sections:

- Hand-held step cut
Insert image
- Hand-held sink cut
Insert image
- Chair back cut
Insert image

20.2.4 **Outboard step cut:** Often used to facilitate branches falling “flat”. The position of the stepped cuts means that the falling section does not rotate over a lip and instead falls away more quickly, catching up with the tip end.

Insert image of outboard step-cut

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Inboard step cut: Often used to facilitate branches falling away tip first. The position of the stepped cuts means that a lip is left which causes the branch to rotate as it falls away.

Insert image of inboard step-cut

20.2.5 **V cut:** To be used on small diameter branches that have a strong forward lean and where there is a risk of 'barber chairing'. This cut will most frequently be used where the branch diameter is too small to allow an effective boring cut.

Insert image of v-cut in stem

Insert image of v-cut hinge on stub/base of branch or stem

20.2.6 **Spear cut:** To be used on small diameter material. This technique may be employed where it is acceptable to damage the ground surface with puncture wounds. Be cautious as this cut can cause tears to the remaining branch, so it should only be used where a finishing cut can be made further down the branch or when the tree is being removed completely.

Insert image of a spear cut stub

Insert image of spear cut (end of branch)

20.2.7 **Holding cuts:** Used to control forward- or backward-leaning branches. These cuts can be made using various techniques and will often be used on branches of a larger diameter where boring cuts can be made safely and effectively.

Insert images of the above – Dog Tooth

20.3 Trapped Machinery

Over-cutting timber which is in compression often results in trapped equipment. To limit the risk of this happening, the branch should be reduced in size by cutting it in multiple small sections, starting at the furthest end of the branch away from its attachment.

If the cutting tool becomes trapped when the kerf closes because of the weight of section being removed, the following procedure should be adopted:

- a. Switch the power tool off and isolate the power supply so that the tool cannot start accidentally during the removal process.
- b. If it is safe to do so and the cutting tool can be held securely, attempt to lift the branch section to open the kerf.
- c. If the tool cannot be safely and securely held, attach it to the tree inboard of the cut or to a separate tool line. **NB: Do not leave it connected to the operator's harness.**
- d. If the section cannot be lifted, make another series of cuts at least 30cm outboard of the previous cuts.
- e. When making the second series of cuts, give preference to the use of a non-powered tool. However, if the branch diameter is too great then powered tools may be used.

Sequence of images showing a trapped machine and the operator dealing with it:

Trapped saw

Trapped saw disconnected from harness

Trapped saw disconnected from harness and tied inboard of cut/ to separate tool line

Trapped saw held and branch being lifted manually

Trapped saw held and branch being severed using a handsaw

Trapped saw held and branch being severed using another chainsaw

21.0 Natural Target Pruning

Carry out natural target pruning where possible when removing limbs and/or limb sections and if the tree or hedge is not being taken out entirely.

Notable exceptions may be when a tree is being veteranised or pruned to create or replicate specific habitat(s) and the specification meets approved standards for such practices.

Natural target pruning must seek to mimic the tree's natural defence strategies and allow the wound to occlude properly, therefore minimising the potential for colonisation of decay pathogens.

Operators must be aware of different species' patterns of wound occlusion. When an operator is not sure where to prune to achieve the optimum level of wound occlusion they should see the advice of an experienced and suitably qualified arborist.

All operators undertaking pruning work should do so only when they can ensure accurate and appropriate target pruning cuts.

Images to show the correct positioning of natural target pruning

Image of flush cut

Image of stub cut

Image of reactive growth from stub/flush cut

22.0 Supplementary Assistive Equipment

22.1 Using Pole Tools in the Tree

Pole pruning equipment can be used to give an operator a greater reach. This may be particularly advantageous where the structure of the tree or the work specification requires work to be carried out in places where the tree cannot support the operator safely, e.g. on the extremity of limbs or above anchor points.

When selecting a pole tool for use, consider the following:

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- the work specification;
- hazards in and around the canopy which may be encountered because of the larger operational radius of the pole, e.g. proximity of overhead powerlines; and
- how the pole tool will be securely attached whilst it is in use off the ground, e.g. will the pole be attached to the operator's harness/rope, directly to the tree, or to a separate tool line?

Image of an operator using a pole pruner/lopper

22.2 Using a Pull/Tag Line

A pull/tag line can provide additional directional control and/or mechanical assistance when limbs or limb sections are being removed.

The line used must be fit for purpose. Take into consideration the line's length, strength and mode of attachment to the section.

A pull/tag line may help:

- removal of larger sections that the aerial operator could not adequately control without mechanical assistance; and
- control of sections which are leaning away from the desired direction of fall or leaning towards a hazard.

Image of an operator using a pull line to guide a branch.

22.3 Using Tape Slings as a Limb Handle

A tape sling can help to control hand-held sections. This technique may be particularly helpful when the limb section is hard to grip because of, for example, smooth bark, wet conditions or operator fatigue.

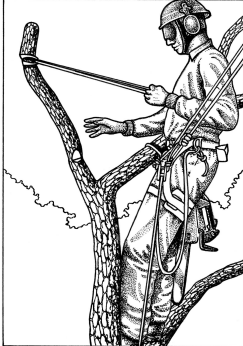
To gain purchase, a continuous loop sling is most commonly girth-hitched. However, other techniques may be used if the configuration of the sling is different.

The sling can be attached before or after the cut is made. Whichever technique is used, ensure that control of the section is maintained at all times.

The sling selected must always be fit for purpose and safe for use. Operators should consider the following:

- objective: what is gained by using this technique?
- strength: the configuration of the sling will have a direct impact on the strength of the sling in use
- length of the sling
- construction/materials of the sling

Image of an operator using a tape sling to hold a branch



23.0 Reducing or Removing Hedges or Lines of Trees

When reducing or removing hedges or closely grown lines of trees, select a work method and/or access technique after considering the following:

- job specification;
- tools required; and
- the operational range of the operator (extent of reach).

If a work positioning system is used, also consider:

- availability of suitable anchor points;
- confined nature of the work space;
- possible need to work above anchor points;
- potential for aerial rescue;
- the need to get down swiftly in the event of emergency;
- limited anchor points; and
- communication with ground staff if they cannot be seen in the intended drop zone.

Picture of height reduction of hedge

24.0 Installing and Checking Bracing and Lightning Systems, Lights and Cameras

When installing any equipment in or on a living tree always give preference to non-invasive installation techniques. Any installation work should take into consideration:

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- the purpose of the installation
- the longevity of installation – temporary, permanent or semi-permanent;
- any pruning work which may need to be undertaken;
- the potential need for a power supply to the installation; and
- the growth of the tree and how that may impact on the installation and the mode of attachment.

Picture of cable bracing and installation

Picture of lighting system (Christmas lights?)

Picture of camera system

Picture of lightning system