



Approved Code of Practice for Safety and Health in Arboriculture

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**Ministry of Business,
Innovation & Employment**



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Notice of Approval

The arboriculture industry plays an important role in New Zealand, working hard to educate its members to a high standard and encouraging tree planting, protection and preservation nationally. However, it is an industry with significant risks.

This Approved Code of Practice has been developed by the Ministry of Business, Innovation and Employment in partnership with industry representatives and other agencies. It is focused on improving safety practices and reducing workplace accidents in the industry. In June 2012, I announced a target of reducing workplace deaths and serious injuries by at least 25 percent by 2020. This code, as a joint initiative of the Ministry and the industry, will play a role in achieving that goal.

This Approved Code of Practice (Section 20 Health and Safety in Employment Act) is a statement of preferred work practices. A Court may consider it when considering compliance with relevant sections of the HSE Act. If an employer can show compliance with all the matters it covers, a Court may consider the employer has complied with the Act.



Hon. Kate Wilkinson
Minister of Labour

Foreword

As Acting Deputy Chief Executive of the Ministry of Business, Innovation and Employment's Labour Group, it gives me great pleasure to introduce this [Approved Code of Practice for Safety and Health in Arboriculture].

The Ministry is resolute in its commitment to work in partnership with industries to reduce the number of workplace fatalities, injuries and occupational disease. In 2011, with two million people working in about 470,000 workplaces, 85 people were killed—that's 85 colleagues, friends, and family members. Another 445 people were seriously injured, some requiring months of medical treatment and rehabilitation. 33,800 ACC claims were filed for work-related injuries^[1].

This toll is too high. We must all work together to ensure that all working New Zealanders return home at the end of their working day to their families, their friends, and their communities. We encourage you to work with us to help achieve our goal of reducing worker injuries by at least 25 percent by 2020.

Members of the Arboriculture Industry have worked hard with the Labour Group to develop this Code. Along with the valued input from a range of stakeholders with interest in arboriculture practice, what has been produced is an Approved Code of Practice of high quality which will lead to higher sustainable levels of health and safety in the industry.



Elizabeth MacPherson
Acting Deputy Chief Executive, Labour, Ministry of Business,
Innovation and Employment

^[1] [The State of Workplace Health and Safety in New Zealand](#) (June 2011). Ministry of Business, Innovation and Employment, Wellington.

Contents

| | |
|------------------------------------------------------|----|
| Notice of Approval | 3 |
| Contents | 5 |
| 1 Introduction | 8 |
| 1.1 Purpose | 8 |
| 1.2 Scope and application | 8 |
| 1.3 Interpretation | 8 |
| 1.4 Legislative framework | 8 |
| 1.5 Hazard management (sections 7 to 10) | 9 |
| 1.6 Identifying hazards | 10 |
| 1.7 Controlling a hazard – the hierarchy of controls | 11 |
| 1.8 Monitoring a hazard | 12 |
| 1.9 Definitions | 13 |
| 2 General | 19 |
| 2.1 General safety statement | 19 |
| 2.1.1 Arborists' competencies | 19 |
| 2.2 Operational considerations | 20 |
| 2.2.1 Machinery/mobile plant | 23 |
| 2.2.2 Protective clothing and equipment | 24 |
| 2.2.3 Hand tools | 26 |
| 2.2.4 First aid | 26 |
| 2.2.5 Reporting accidents | 27 |
| 2.2.6 Transportation of workers | 27 |
| 2.2.7 Storage of petrol and other flammable liquids | 28 |
| 2.2.8 Container for transportation of fuel by foot | 29 |
| 2.2.9 Lifting and handling | 29 |
| 2.2.10 Fires | 29 |
| 2.2.11 Tree work approaching power lines | 29 |
| 2.2.12 Underground services | 32 |
| 2.2.13 Public safety | 32 |
| 3 Specific work activities and machinery | 34 |

| | | |
|-------|-----------------------------------------------------|----|
| 3.1 | Safe use of chainsaws | 34 |
| 3.1.1 | General | 34 |
| 3.1.2 | Chainsaw safety | 34 |
| 3.1.3 | Starting the chainsaw | 35 |
| 3.1.4 | Chainsaw operation | 35 |
| 3.1.5 | Refuelling the chainsaw | 36 |
| 3.1.6 | Use of chainsaws aloft | 36 |
| 3.2 | Climbing techniques and equipment | 37 |
| 3.2.1 | Knots in arboricultural operations | 37 |
| 3.2.2 | Climbing | 37 |
| 3.2.3 | Climbing equipment | 38 |
| 3.2.4 | Climbing lines | 39 |
| 3.2.5 | Friction hitches | 40 |
| 3.2.6 | Safety harnesses | 40 |
| 3.2.7 | Tree-climbing spurs (spikes) | 41 |
| 3.2.8 | Ladders | 42 |
| 3.2.9 | Ancillary equipment | 42 |
| 3.3 | Tree pruning | 43 |
| 3.3.1 | General provisions | 43 |
| 3.3.2 | Handsaws | 43 |
| 3.3.3 | Pole pruners | 43 |
| 3.3.4 | Mechanical pruning | 44 |
| 3.4 | Tree felling | 44 |
| 3.4.1 | General provisions | 44 |
| 3.4.2 | Felling operations | 46 |
| 3.4.3 | Accepted felling methods | 47 |
| 3.4.4 | Tree dismantling and rigging | 49 |
| 3.4.5 | Felling against the lean of the tree (back-pulling) | 49 |
| 3.4.6 | Winches, wire ropes and accessories | 50 |
| 3.4.7 | Windthrow | 51 |
| 3.5 | Machine operations | 51 |
| 3.5.1 | Chippers and Grinders | 51 |
| 3.5.2 | Mobile elevating work platforms (MEWP) | 53 |

| | |
|-----------------------------------------------------------------------------------|----|
| 3.5.3 Cranes and related hoists | 55 |
| 3.5.4 Helicopters | 57 |
| 4 Appendices | 59 |
| 4.1 A summary of the Health and Safety in Employment Act 1992 | 59 |
| 4.1.1 The Act | 59 |
| 4.1.2 Regulations | 60 |
| 4.1.3 Approved codes of practice (section 20) | 60 |
| 4.1.4 Employers' duties (section 6) | 60 |
| 4.1.5 Employees and health and safety representatives (section 12) | 61 |
| 4.1.6 Training and supervision of employees (section 13) | 62 |
| 4.1.7 Responsibility for employees' work activities (section 15) | 62 |
| 4.1.8 Persons in control of a place of work (section 16) | 62 |
| 4.1.9 Duties of the self-employed (section 17) | 62 |
| 4.1.10 Duties of principals (section 18) | 63 |
| 4.1.11 Hirers, sellers and suppliers of plant (section 18A) | 63 |
| 4.1.12 Duties of employees (section 19) | 63 |
| 4.1.13 Deemed employees | 63 |
| 4.1.14 Opportunities for employee participation (Part 2A) | 64 |
| 4.1.15 Notification of particular hazardous works (section 23 of the Regulations) | 64 |
| 4.1.16 Accidents, serious harm and notification (sections 25 and 26) | 65 |
| 4.2 Relevant Acts, codes and standards | 66 |
| 4.2.1 Legislation | 66 |
| 4.2.2 Approved codes | 66 |
| 4.2.3 Standards | 66 |

1 Introduction

1.1 Purpose

This code has been prepared by representatives of the arboriculture and forestry industries and the Ministry of Business, Innovation and Employment. The purpose of this code is to provide practical guidance to employers, contractors, employees and all others engaged in work associated with arboriculture on how they can meet their obligations under the Health and Safety in Employment Act 1992 and its associated Regulations. Accordingly, compliance with this code is recommended.

1.2 Scope and application

This code is primarily aimed at the arboriculture industry, in relation to climbing, pruning, trimming, maintaining and removing trees, cutting brush and for using equipment in such arboricultural operations not involving electrical hazards.

This code should be read in conjunction with the related approved codes of practice:

- Tree Work Around Power Lines
- Forestry Operations

1.3 Interpretation

In this code, the terms “shall” and “should” are used. “Shall” is used where there is a requirement to meet legal obligations. “Should” is used as a way of indicating the practicable steps the Ministry expects to be taken on a particular matter.

1.4 Legislative framework

The Health and Safety in Employment Act 1992 (the Act) is the over-arching legislation for health and safety in the workplace context and compliance with the Act is mandatory.

The Act is underpinned by a number of Regulations. A full copy of the Act and the associated Regulations can be downloaded (free) at www.legislation.govt.nz.

Note that compliance with the Act and its associated Regulations is mandatory. Further information on the Act can be found in section 4.1.

1.5 Hazard management

Employers shall identify and regularly review hazards in the place of work (existing, new and potential) to determine whether they are “significant hazards” and require further action. If an accident or harm occurs that requires particulars to be recorded, employers are required to have the matter investigated to determine if it was caused by or arose from a significant hazard.

Significant hazard means a hazard that is an actual or potential cause or source of:

- serious harm (defined in Schedule 1 of the Act)
- harm (being more than trivial) where the severity of effects on any person depend (entirely or among other things) on the extent or frequency of the person’s exposure to the hazard
- harm that does not usually occur, or usually is not easily detectable, until a significant time after exposure to the hazard.

The Act requires all employers, principals, and persons in control of a place of work to take all practicable steps to ensure that workers are not exposed to hazards by following an effective hazard identification process. This involves the following steps.

- Systematically identifying and assessing the risk of harm to a person exposed to the hazard.
- In the case of a significant hazard, controlling the hazard, and if the hazard cannot be eliminated or isolated then it should be minimised.
- Monitoring the hazard, regularly assessing the hazard.

Where the hazard is significant, the Act sets out the steps employers shall take.

- Where practicable, the hazard shall be eliminated.
- If elimination is not practicable, the hazard shall be isolated.

- If it is impracticable to eliminate or isolate the hazard completely, then employers shall minimise the likelihood that employees will be harmed by the hazard.
- Where the hazard has not been eliminated or isolated, employers shall take steps to minimise the exposure or likelihood of exposure to the hazard and where appropriate:
 - provide protective clothing and equipment and ensure that it is accessible and used
 - monitor employees' exposure to the hazard
 - seek the consent of employees to monitor their health
 - with informed consent, monitor employees' health.

1.6 Identifying hazards

The first stage of identifying hazards occurs in the design and work planning phase. It is at this time that the generic hazards associated with that type of work and some of the specific hazards for the job are identified.

During the planning phases it may be possible to identify ways to eliminate a potential hazard, for example by using different equipment.

One way to ensure hazards are adequately identified is to complete a task analysis prior to commencing the work and include site-specific hazards. This enables a review of the proposed work practices and provides an opportunity to plan for any safety equipment or tools required for the control of the hazards.

Once you have identified the hazard, you shall assess the risk of harm occurring. Taking all practicable steps means doing what is reasonably able to be done in the circumstances, taking into account:

- the severity of any injury or harm to health that may occur
- the degree of risk or probability of that injury or harm occurring
- how much is known about the hazard and the ways of eliminating, reducing or controlling it
- the availability, effectiveness and cost of the possible safeguards.

1.7 Controlling a hazard – the hierarchy of controls

The control hierarchy is outlined in the Act and requires people to take all practicable steps to control each hazard. The Act is very specific about the order in which you need to consider the appropriate control/s for a hazard.

To take all practicable steps to control a hazard, you should plan the work to identify how to control it.

Ways to assess which control is appropriate for each identified hazard include:

- looking at similar workplaces or processes
- looking at the workplace's previous incident and injury reports and data for falls
- consulting health and safety representatives and other employees
- looking at the way tasks/jobs are performed
- looking at the way work is organised.

Elimination

Elimination of the hazard is naturally the first preference for controlling a hazard as it completely removes the potential harm.

Isolation

Isolation of the hazard provides a barrier that prevents people from getting to the hazard (or the hazard from getting to them).

The hazard still exists, but in this way everyone is protected so long as the isolation method is monitored and/or maintained.

You may isolate a hazard using time or space. Examples include completing particular work at different hours when other people will not be around, or providing a physical barrier that prevents unauthorised access to the hazard.

Isolation methods may be used in conjunction with other control methods.

Minimisation

This is the least preferred method of controlling a hazard but it can be effective, and in certain circumstances may be the appropriate method of controlling a hazard.

Often people see minimisation steps as an easy option and consider it ahead of other options. This is not correct and where practicable steps to either eliminate or isolate a hazard are available, using a minimisation step contravenes the Act. The reason that minimisation is at the bottom of the hierarchy of controls is that, unlike elimination and isolation methods, there is still a level of exposure to the hazard. A minimisation step only minimises the risk of harm or the actual harm that may result from the hazard.

For example, training people to a higher skill competency may reduce the risk of an incident occurring or reduce the harm incurred, but won't necessarily prevent either. Similarly, where most workers are isolated from a hazard, but trained or specialist personnel can access it, harm can still be incurred, but the likelihood is reduced.

In many circumstances where minimisation steps are used, such as protective clothing/equipment, an individual may still be harmed. However, the likelihood of harm and the severity of the injuries are minimised.

The Act places duties upon people to prevent harm. Therefore opting for a minimisation control when there is a risk of harm (in the absence of considering the higher-ranked alternatives of elimination and isolation) contravenes the Act and puts employees and contractors at risk.

1.8 Monitoring a hazard

If a hazard has not been eliminated, then on-going monitoring of the hazard shall occur. Monitoring may include:

- regular safety checks
- maintenance of vehicles, plant or tools etc
- updated or renewed training for people.

1.9 Definitions

Aerial rescue: the procedure for rescuing an injured climber from aloft.

Agricultural chemicals: any fertiliser, soil conditioner, pesticide and additives in liquid, dust, granule, paste or any other form.

Aloft: once a climber has left the ground, they are considered to be aloft.

Arboriculture: the management and care of amenity trees.

Arborist Code: *Approved Code of Practice for Safety and Health in Arboriculture.*

Arborist climbing line: a rope used solely for the purpose of supporting a climber while aloft. An arborist climbing line shall have a minimum breaking strength of 22 kN when new.

Arborist trainer: a person certificated by a Tertiary Education Organisation (TEO) as currently competent to deliver training to the outcomes required by this code.

Ascender: a mechanical device that will slide upwards on a rope but will grip when pulled in the opposite direction.

Auto-locking carabiner: a carabiner, which upon closing, automatically moves into the locked position and requires a minimum of three distinct movements to open it.

Cambium saver: a device used to protect the bark, cambium and climber's line from damage caused by friction. A cambium saver used as part of a climbing system shall meet the minimum breaking strength requirements of 22 kN.

Carabiner: a metal loop with a sprung or screwed gate used as a connector.

Chainbrake: a chainbrake is designed to stop the moving chain if the front guard is moved forward. All chainsaws sold in New Zealand shall have a compliant chain brake.

Chipper (brush-wood chipper): portable machinery used to reduce the size of brush-wood by cutting/chipping it into smaller pieces.

Climbing line: see arborist climbing line.

Climbing saw: is any chainsaw used while in the tree.

Climbing: ascending, descending or lateral movement while carrying out operations in a tree.

Communications line: a wire or a conductor of any other kind (including a fibre optic cable) used or intended to be used for the transmission of any communications by means of an electromagnetic system and includes:

- any pole, insulator, casing, fixture, tunnel, or other equipment or material used or intended to be used for supporting, enclosing, surrounding, or protecting any of those wires or conductors; and
- any part of a communications line.

Competent person: a person who can consistently demonstrate the skill and knowledge derived from experience and/or training for the type of work in which the person is employed and the approved code the person is required to work under.

D-Rings: attachment points on a climbing harness designed for the attachment of a climbing line, work-positioning lanyard.

Dismantling a tree: the process of reducing a tree's size or height in sections/pieces from aloft.

Drop start: the act of starting a chainsaw by pushing the saw away from the body with one hand while simultaneously pulling on the starter cord handle with the other. This is not an approved work practice.

Employer: any employer, self-employed person, or principal to a contract who employs any other person to do any work for hire or reward.

Extended arm technique: a method of starting a chainsaw while aloft.

False crotch: a system used to support an arborist line other than a natural crotch. A false crotch used to support an arborist climbing line shall incorporate rings or a pulley that will protect the system and arborist climbing line from damage or failure. Each component of the system shall be rated to a minimum of 22 kN.

Foreman, foreperson: a person nominated by the company as being in control of place of work.

Friction device: a device constructed of alloy or metal used to control the friction on a line. When used as part of the climbing system to secure a tree climber to the climbing line, it permits controlled ascent, descent and work positioning. It shall be stamped or marked to the appropriate standard and rated to a minimum of 22 kN.

Friction hitch: usually constructed of synthetic fibre and rated to a minimum of 22 kN. Used to secure a tree climber to the climbing line, permitting controlled ascent, descent, and work positioning.

Friction saver: see cambium saver.

Grinder (stump grinder): portable machinery used to reduce or remove stumps from the ground by the act of grinding.

Karabiner: see carabiner.

Kilonewton (kN): a unit of measurement for weight. It is used in this context for stating safety holding values of fasteners, anchors and climbing equipment. The safe working loads in both tension and shear can be stated in kN. As a rule of thumb, 1 kN is approximately equal to 100 kilograms.

LAB approval number: a number allocated by an Approved Cylinder Design Verifier to designate approval for fuel cylinder design. The register is maintained by the Environmental Protection Authority (EPA).

Lowering/pulling/rigging line: a rope used in arborist operations to control the movement of a limb or tree.

Machine/mobile plant: any machinery, apparatus or appliance that may be used in or about an arboriculture operation.

MEWP: Mobile elevating work platform.

Micro pulley: a small lightweight pulley.

New Zealand Standard: a standard approved by the Standards Association of New Zealand or in force for the time being or from time to time and available from the Standards Association of New Zealand.

Power line: all electrical conductors including service mains (including fittings supporting, or connected to, those conductors), that are used, or intended to be used, in or in connection with the supply of electricity:

- from the outgoing terminals of a generating station, building, enclosure, or other structure, to the incoming terminals of any other building, enclosure, or other structure
- including all overhead electric mains such as service, power company or customer mains, or sub-mains, whether owned by an electricity network company or private owner. In this code the term 'power line' prefixed by 'overhead' means a power line above ground and 'underground' means a power line below ground.

Qualified Arborist: a person who holds a recognised degree, diploma, certificate in arboricultural operations, and is familiar with the equipment and hazards involved in arboricultural operations, and who has demonstrated the ability to perform the tasks involved and meets the competencies in this code.

Rigging: the use of ropes, slings and mechanical devices to generate a mechanical advantage to safely lower limbs or sections of tree in a controlled manner, and to help minimise the impact on the surrounding environment.

Safe working load (SWL): the safe working load of a piece of equipment as specified by the manufacturer.

Safety mitt: made of leather and securely attached to the front handle of the chainsaw but free to rotate on it. It provides protection for your hand and keeps your left hand on the handle in the event of kickback.

Safety lanyard (strop/flip line): an adjustable rope or strop designed as a work positioning aid. All materials shall meet the minimum strength requirements of an arborist climbing line.

Snap hooks (lanyard clips): a metal loop with a sprung gate used as a connector.

Spikes (spurs, climbing irons): a climbing accessory attached to the lower leg used to gain access to the tree, used in conjunction with a safety strop.

Sprag: a point, burr or patch of roughness on a metal surface.

Tertiary Education Organisation (TEO): a polytechnic, registered private trainer (PTE), industry training organisation (ITO) or registered teaching organisation able to deliver NZQA-aligned industry standards and assessments.

Throw bag: a small weighted flexible bag attached to a lightweight line that can be thrown over a suitable anchor point in the tree.

Tool strop: a short line used to secure tools while aloft.

Trainee arborist: an employee (or student) undertaking work who is not yet competent and who is supervised by a competent person.

Tree: a long-lived woody plant usually with a single trunk and many side branches.

Tree felling: the execution and placement of felling cuts to fall, remove, or bring safely to the ground, a standing tree. (This excludes height reductions, structural or formative maintenance of standing trees.)

Trees Code Part 2: *Approved Code of Practice for Safety and Health in Tree Work Part 2: Maintenance or removal of trees*

around power lines, published in 1996, or any document which supercedes it.

Vegetation management zone: the zone around power lines in which trees or tree parts are being trimmed, fallen or removed, that can be worked in:

- only with consent from the power line owner
- by arborists specially trained and certificated to Trees Code Part 2 requirements
- using approved work practices conforming to Trees Code Part 2.

Work positioning lanyard: see safety lanyard.

Work positioning harness: a harness designed to position or suspend the user to enable work to be conducted safely and efficiently, not suitable for fall arrest situations.

2 General

2.1 General safety statement

The potential for accidents in tree work is very high, and many of the injuries are serious. So safety at work is of the utmost importance to you, your family and your fellow workers. Injuries have been reduced by the use of good safety rules in professions and industries the world over.

All arborists engaged in arboricultural work shall be suitably qualified to carry out that work. Competency outcomes shall be documented, including any national qualifications supporting competency to this code.

Adopt a safe conduct attitude.

- Work with due consideration for your own and others' safety at all times.
- Carry out instructions properly.
- Seek clarification if in doubt or unsure about any item, process or activity
- Rectify and report all unsafe conditions.
- Report unsafe machinery and equipment.
- Use correct tools and equipment.
- Keep the workplace as tidy and organised as practicable.
- Have all injuries reported and attended to.
- Use only tools, machinery and equipment that you are authorised and trained to use.
- Do not start machinery unless authorised and until guards are in place and people aware.
- Wear and use the protective clothing and equipment provided.
- Obey all safety rules and signs.

2.1.1 Arborists' competencies

This is a list of the competencies considered core competencies for an arborist as defined in this code.

- Hazard awareness and control
- Health and safety in the work place
- Worksite organisation

- Signage and pedestrian control/traffic control
- Maintaining separation from utility services
- Identifying and contacting asset owners
- Knowledge of the power industry
- Soils, botany and plant health (including pests and diseases)
- Plant and equipment used in tree maintenance

Workers should also be trained and competent in the following areas as they apply to their work.

- Safe use and maintenance of chainsaws
- Safe use and maintenance of pruning tools and winching equipment
- Tree identification
- Tree hazard identification
- Tree climbing, pruning, dismantling and felling techniques
- Use, inspection and maintenance and storage of personal protective equipment
- Emergency procedures for tree and MEWP aerial rescue
- Maintenance of amenity trees
- Rigging and rigging equipment
- Use and application of agrichemicals
- Use of mobile plant including MEWP
- Use and maintenance of brush chippers and stump grinders
- Mechanical theory (use of winches etc)
- Hand tools and small plant use and maintenance
- Use and identification of specialist arboricultural climbing equipment, handling, maintenance and storage

2.2 Operational considerations

Workers engaged in tree work should be physically capable and fit.

The employer shall provide a first-aid kit adequately stocked and maintained where arboricultural work is being carried out. Some form of communication (eg, mobile phone or RT) should be available as part of this first-aid kit. All workers shall be trained in emergency care first aid.

Employers shall also ensure that all workers are properly instructed and trained in the work they are required to perform and the dangers or hazards involved in each operation.

Employers shall nominate a competent person to be in charge of each operation. That person shall exercise such supervision as will ensure that the work is performed in a safe manner at all times. Another competent person shall be nominated to take charge if it is necessary for this person to leave the operation.

1. Should any employer hire an experienced worker, the new employee shall (before being allowed to work unsupervised) be required to demonstrate to the employer or the person in charge that they have the competence to safely accomplish the work they may be required to perform. Workers holding a valid and approved training qualification shall be considered experienced in those skills or special skills in which they have qualified.
2. Should an employer hire an inexperienced worker, the employer shall provide the instruction or training required and ensure close supervision until the employee demonstrates their competency to work safely in the job they are to perform. Training while off the ground shall be on a one-to-one basis.

All workers shall acquaint themselves with the relevant safety provisions of this code for each operation, and shall take all practicable steps to ensure their own safety and the safety of others engaged in each particular operation.

All workers should be able to perform assigned duties safely and acceptably without any limitations due to the use or after-effects of alcohol, illicit drugs, non-prescription drugs, or prescribed medications or any other substance.

Where any operation becomes dangerous because of high winds, wet weather, poor visibility or other adverse conditions, the employer or person in charge shall suspend operations while those conditions exist. In emergency situations, work should be the minimum to make the situation safe.

Before any work is carried out, or any climbing is done, a proper inspection of the work area shall be carried out to identify hazards to the worker. For example, these may include decay or rot, dead branches, suspended materials such as branches, interlocking branches or power lines. All workers shall be given clear

instructions on the work to be done and any hazards involved to themselves, property or to the public.

All tree work requiring an arborist to ascend above three metres shall have a second person on site trained in aerial rescue and have appropriate rescue equipment and procedures in place.

No person should work alone aloft and/or with a chainsaw. Visual or voice contact is maintained with another person who is able to assist or obtain help in an emergency.

While working on their own in other circumstances, a worker's presence and welfare shall be appropriately managed by the employer so the worker has access to suitable communication at all times.

All persons approaching an operational area shall:

1. before entering the area, notify the employer or person in charge
2. while machinery is operating, approach the area, where practicable, from above or level with the operation
3. draw attention to their presence
4. not enter the operational area until acknowledged or signalled to do so.

No person under the age of 15 shall work in any arboriculture operation. Work carried out by young persons shall not be beyond their physical capabilities, and they shall be fully trained or in training under adequate supervision while engaged in an arboriculture operation. In addition, no person under the age of 15 years shall be, without the permission of the person in charge and unless under constant supervision of a responsible person, permitted in the vicinity of arboricultural operations.

A hand-held fire extinguisher designed for class "B" fires shall be immediately available. It shall be of suitable capacity in relation to the potential fire hazard.

All tree work sites shall be left safe at the end of each work period. At close of work for the day, provision shall be made for the safety of all persons during darkness.

All work with trees in the vicinity of power lines, including any use of mobile plant and equipment, shall conform to Trees Code Part 2.

2.2.1 Machinery/mobile plant

No machine shall be used unless it is:

- in a sound and safe condition, maintained and inspected in accordance with manufacturers' instructions
- suitable for the operation in capacity and design
- operated by a competent person (or person training under adequate supervision)
- serviced and operated within the manufacturer's recommendations and specifications.

Unless being trained under adequate supervision, operators shall only use machinery and equipment they are trained and authorised to use.

Any person who discovers any defect in any machinery shall immediately report the defect to the person in charge of the operation.

All defective machinery shall be shut down until repairs are made and the machine inspected and tested before returning to service. Adjustments shall never be made while a machine is in motion. No person shall get under any raised blade or accessory for any purpose.

Where machines are operating adjacent to or on roads or road verges, appropriate road signage shall be used in accordance with the consent and requirements of the New Zealand Transport Agency or the appropriate roading authority.

Material and equipment carried on vehicles shall be properly stored and secured to prevent movement, spillage and departure from the moving vehicle.

In arboriculture operations, owners of machinery used shall take all practicable steps to eliminate, at source, excessive noise levels that are likely to impair a worker's hearing. Where the excessive noise is integral to the machine's operation, then the appropriate isolation, personal protective equipment (PPE) and associated training shall be required.

All machinery used in an arboricultural operation shall comply with the relevant legislation.

2.2.2 Protective clothing and equipment

Protective clothing, equipment and appliances are complementary to, but not a substitute for, full instruction, sufficient training and adequate supervision.

General

Protective equipment suitable for the work being performed shall be provided for the use of all workers by the employer.

No persons shall interfere with or misuse any equipment, means or appliance provided for their protection and health.

Long hair shall be confined in such a manner as to prevent it being caught by any moving part of any tools or machinery.

Clothing

All clothing shall fit fairly closely about the worker, be comfortable and allow free movement. Damaged or torn clothing shall be properly repaired or replaced.

Clothing of high-visibility (hi-vis) colours should be worn so that workers or other persons entering operational areas are more readily seen by others (badly faded hi-vis clothing should be replaced).

Leg protection

All workers required to use a chainsaw shall wear safety leg protection complying with either *AS/NZS 4453.3 1997 Protective clothing for users of hand held chainsaws, Part 3, Protective leg wear* or any other standard with the same or more stringent criteria.

Safety footwear

All workers engaged in arboricultural operations shall wear footwear which has safety toe caps complying with either *AS/NZS 2210 Occupational protective footwear Part 1* or any other standard with the same or more stringent criteria. Footwear should also provide support to the ankles and be laced.

Safety helmets

All safety helmets shall comply with the requirements of *NZS 5806:1980 Specification for industrial safety helmets (medium protection)* or better.

Safety helmets shall be worn at all times by all persons in or about an arboricultural operation.

Machine operators who are fully protected by a certified protective structure and restrained by a certified seatbelt need not wear helmets. However, should the operator cease to be fully protected by the canopy, a safety helmet shall be worn.

Safety helmets shall be brightly coloured or hi-vis.

Helmets shall be inspected before use and removed from service if signs of excessive wear or damage are found. Otherwise helmets shall be replaced as recommended by the manufacturer.

Helmets should not be stored in a place where they are exposed to direct sunlight. Paints, petrol, oil or solvents should not be applied to helmets, as they can cause deterioration.

All safety helmets should have a chin strap to prevent accidental loss or removal while working aloft.

Hearing protection

All workers shall wear hearing protection in any area subject to harmful noise.

| Class | $L_{Aeq,8h}$ dB(A) |
|----------------|--------------------------------------|
| Class 1 | Less than 90 |
| Class 2 | 90 to less than 95 |
| Class 3 | 95 to less than 100 |
| Class 4 | 100 to less than 105 |
| Class 5 | 105 to less than 110 |

All chainsaw operators shall wear at least grade 4 hearing protection.

Earmuffs shall be inspected before use and removed from service or replaced if signs of excessive wear or damage are found.

Eye protection

Suitable visors or safety glasses shall be worn for eye protection at all times. Ensure that eye protection does not compromise the fit and seal of earmuffs.

Eye protection shall be inspected before use and removed from service or replaced if signs of excessive wear or damage are found.

2.2.3 Hand tools

All tools used shall be kept in good working condition, be properly sharpened where applicable, and should be restricted to the use for which they are intended.

Handles shall be securely and correctly attached to tools.

All tools shall be removed from a tree when the worker has finished the task or when a crew is finished for the day.

2.2.4 First aid

Subject to the provisions of any Act, award or industrial agreement:

- all workers involved in arboricultural operations shall hold a current first-aid certificate.
- a first-aid kit or box shall be kept in each vehicle and at each work area. Vehicle kits or boxes can substitute for those required at each work area, provided a vehicle remains at the work site
- every box or kit shall be kept fully stocked and shall be stored to ensure that the contents are protected against contamination by dust, heat, moisture or any other source.

For further information on First Aid, see the Ministry of Business, Innovation and Employment's publication *First Aid for Workplaces – A Good Practice Guide* available at http://www.osh.govt.nz/publications/booklets/first-aid-2009/first-aid-2009_01.asp]

2.2.5 Reporting accidents

All accidents and near misses shall be recorded. Instances of serious harm shall be reported to the Ministry of Business, Innovation and Employment (refer to section 4.1 for the legislative summary or section 4.3 for a template form). Reporting procedure and forms can be found on the Ministry of Business, Innovation and Employment website at www.osh.govt.nz/services/notification/accident.shtml

2.2.6 Transportation of workers

Drivers should be aware of the following points.

- Drivers shall hold a current full licence while transporting others to and from work (and hold additional endorsements as legally required).
- Any driver should be authorised by the employer.
- Drivers should immediately inform the vehicle owner of any change in their driver's licence status.
- Drivers shall not be impaired by drugs or alcohol.
- If suffering from fatigue do not drive. (Stop or swap drivers).
- Drivers should advise all passengers to wear safety belts.
- Drivers should avoid distractions while driving.
- Always drive at a safe speed for the road, climate and conditions.
- Take extra care when towing trailers (maximum speed for towing is 90 km/h).
- Report all accidents/close calls/vehicle maintenance issues and driving infringements to the vehicle owner.

Each person authorised to travel in a vehicle conveying workers shall have a suitable place to sit under cover and shall be seated on a properly made and secured seat with a seat belt.

All tools, fuel and equipment shall be stowed securely in separate compartments designed specifically for such use.

Vehicle requirements:

- Vehicles shall meet all legal requirements, including current Warrant of Fitness (WoF) and Registration. NB. All vehicles that have 13 seats (or more) require a Certificate of Fitness (CoF).

- If larger passenger service vehicles are used, your business shall have a 'Passenger Service Licence', adhere to the 'Work Time and Logbook Rules' and you shall display a 'Transport Service Licence' (TSL) label in the front window of the vehicle.
- Vehicles that have had design changes to fitted seats, or additional seats installed, shall be certified.
- All vehicles should have fully functional safety belts for all seats, regardless of age and type of vehicle. NB. This is best practice, despite minimum legal requirements allowing some older vehicles with more than nine seats to be warranted without fitted seat belts.
- All vehicles shall have sufficient seats for the number of passengers.
- All vehicles should be fitted with a fire extinguisher and a first-aid kit.

2.2.7 Storage of petrol and other flammable liquids

Petrol and other flammable liquids shall be conveyed, stored and packed in containers that comply with requirements prescribed under the Hazardous Substances and New Organisms Act 1996.

Containers shall:

- be made of metal or other approved materials
- be of such construction that the contents cannot escape in either liquid or vapour form
- require a design verification by a Test Certifier approved by the Environmental Protection Authority (EPA), if made of plastic.

When refuelling portable equipment, adhere to the following.

- No smoking
- Stop the motor
- Move at least three metres away from the refuelling area before restarting

2.2.8 Container for transportation of fuel by foot

Only containers with a LAB number, or those approved by a Test Certifier shall be used to carry fuel for on-site refuelling. These should not exceed five litres in capacity.

On filling, an air gap of five percent by volume shall always be left in the container.

Containers shall be regularly inspected and removed from service if signs of excessive wear or damage are found.

Glass containers shall not be used to carry oil or fuel in any operation.

2.2.9 Lifting and handling

Do not try to lift or move objects beyond your capacity—ask for help.

Bend knees, grasp the load and lift by straightening the legs. Avoid reaching, bending forward to lift, twisting the back or bending sideways.

2.2.10 Fires

Fires may only be lit with a permit from the appropriate fire authority.

Petrol shall not be used to start a fire or as an accelerant.

Fires shall not be lit under or near overhead power lines as electrical discharge through the smoke may occur.

Fires should be extinguished and ashes cold at the end of the day's work.

2.2.11 Tree work approaching power lines

Electrical hazards

Trees close to power lines are hazardous to the lines, to the power supply, to persons attempting to do trimming or felling work, and to other persons close by.

Trees touching or nearly touching power lines may become electrically livened with little or no visual indication. Electricity may also arc or flash over to the trees touching or near to the power lines. Similar electrical hazards can happen where any mobile plant, any tow attachment, or any other tools or equipment are near to or touch the live power lines or livened trees.

If any tree or mobile plant does become livened, the electrical hazard can instantaneously spread through the surrounding ground. This makes the electrical hazard area much wider and it exposes all persons in the work area or in the vicinity to risk of electric shock. In the wider hazard area, persons can get an electric shock from being across branches in the tree; from touching a tree, mobile plant or any tools or equipment involved; or even from walking on the livened ground.

Direct or indirect electrical contact can result in death, burns, or other health effects such as nerve or tissue damage and heart episodes.

Avoiding electrical hazards

All power lines shall be treated as being live and posing a significant hazard unless an authorised person or competent electrical worker formally advises that they are safe from electrical hazards.

Electrical Code of Practice (ECP) 34 governs separation distances for persons and mobile plant from power lines, and applies in this code.

- Persons shall not approach closer than four metres minimum safe distance from power lines of voltage up to and including 110 kV unless with written consent and safety conditions from the power line owner.
- Persons shall never approach closer than six metres minimum safe distance from power lines of voltage over 110 kV in any circumstances.
- Mobile plant (for example, elevating work platforms, cranes, mechanical shelter belt trimmers, logging machinery and any attachments) shall not approach closer than four metres minimum safe distance from any power lines unless with written consent and safety conditions from the power line owner.

Trees Code Part 2 applies these requirements for work with trees, restricting work on trees that extend into the vegetation management zone specified in this code.

Trees Code Part 2 (1996) restricts work on trees that extend into the 'competent worker zone' to 'competent tree workers'. These are arborists specially trained and certificated competent to Trees Code Part 2 (1996). It permits any tree worker (including arborists competent to the Arborist Code) to work with trees in the 'any tree worker zone' illustrated in Trees Code Part 2.

Arborists shall:

- not work on trees that extend into the 'competent worker zone'
- obtain consent before using any mobile plant closer than four meters from any power line
- not use wire ropes or strops within four metres of any power line
- not use metal ladders or metal-handled pruners or tools where trees worked on may extend into the 'competent worker zone'.

The agreed imminent *Approved Code of Practice for Tree Work Around Power Lines* (2012) will restrict work on trees extending into the vegetation management zone illustrated in that code to 'utility arborists' specially trained and certificated to that code. However, other persons such as arborists working to the Arborist Code, with written consent and safety conditions from the power line owner, may be permitted to work with trees that extend into the vegetation management zone.

In general, power line owners may give such consent where there are no electrical hazards and where they are satisfied with safety provisions in the work plan.

Under the *Approved Code of Practice for Tree Work Around Power Lines*:

- arborists shall not work on any trees extending into the vegetation management zone unless they have obtained consent with safety conditions for the work from the power line owner

- arborists shall not use mobile plant for such work unless they have obtained consent with safety conditions for its use from the power line owner
- arborists shall not use metal-handled pruners or tools, metal ladders, or strops/flip lines containing metal within the vegetation management zone or on any tree extending into this zone.

Note: The updated minimum safe approach distances forming the vegetation management zone in the *Approved Code of Practice for Tree Work Around Power Lines* (2012) are consistent with the four- and six-metre requirements in ECP 34, as applied for tree work.

Take particular care with trimmings or branches that may fall into close proximity to power lines. Ropes or appropriate pruning techniques shall be applied to ensure trees or tree parts do not fall within the vegetation management zone around power lines.

2.2.12 Underground services

All work (for example, stump removal or tree trans-planting) that may impact on underground services (for example, gas water, electricity, telecommunications or broadband ducts and cables, and waste water) shall be notified to the appropriate authority. Sound practical advice is given in the Ministry of Business, Innovation and Employment publication *Guide to Underground Services* available at <http://www.osh.dol.govt.nz/order/catalogue/undergroundservicesguide.shtml>.

2.2.13 Public safety

General public

If any risk of injury to the public exists, then the site shall be managed in such a way as to ensure public safety.

Work on or near transport corridors

If the operation poses a risk to or is in a transport corridor (for example, road, rail, footpath, public access), operations shall not proceed until the transport corridor manager has been advised and any requirements they specified are met. For example, this may require suitable precautions to warn oncoming traffic. Such

precautions shall include the appropriate signage and/or notification in accordance with the New Zealand Transport Agency or the appropriate road and/or rail authorities.

Where work necessitates the closing or partial closing of a road, footpath or public access, the above precautions are to be taken and compliance is required with any conditions laid down by the transport corridor manager.

3 Specific work activities and machinery

3.1 Safe use of chainsaws

3.1.1 General

Chainsaws shall comply with *NZS 5819:1982 Chainsaw safety: Part 1: Code of Practice for safe use of petrol and electrical chainsaws; Part 2: Specification for the safe design of petrol and electrical chainsaws*; or any other standard embodying the same or more stringent criteria.

Chainsaws shall always be used in accordance with the manufacturer's instructions.

3.1.2 Chainsaw safety

Chainsaws shall be used within their physical or operational capabilities and all operators shall have adequate training. It is important to identify and control all hazards prior to commencing work. Note that the dangers of carbon monoxide poisoning when working in situations where restrictions on the dispersal of exhaust fumes are encountered can be fatal.

Operators should be a minimum of 1.5 metres away from each other and shall use a safety mitt when on the ground. Note that climbing saws do not require the use of a safety mitt while being used aloft. Using a tear-away chainsaw lanyard/tool strop attachment is recommended practice when aloft.

The chainsaw shall be inspected before use and removed from service or rectified where necessary if signs of excessive wear or damage are found. Operators shall not operate defective or poorly maintained chainsaws.

Except for the fine-tuning of the carburettor, no cleaning, oiling or adjustments shall be carried out while the motor is running.

3.1.3 Starting the chainsaw

A chainsaw motor shall only be started when it is clear of all obstructions or people.

Approved starting methods are:

- starting a chainsaw on clear ground
- step-over method for warm starting (the throttle lock should not be used and it is recommended that the chainbrake be engaged)
- extended arm technique (when aloft).

Drop starting a chainsaw is prohibited.

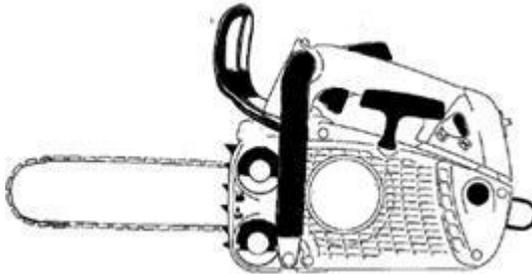
When starting a chainsaw aloft, use the extended arm technique. The chainsaw shall be held firmly in place or otherwise held in a manner that restricts the movement of the saw when pulling the starter handle. The chainbrake shall also be engaged.

3.1.4 Chainsaw operation

Always use all protective equipment, appliances or other means provided to afford protection and safeguard health.

Chainsaws shall be used as per manufacturer's instructions. They shall be used with two hands. The right hand encircles the top/rear handle and the left hand encircles the wraparound handle.

Top-handled chainsaws shall not be used on the ground.



Except for short unobstructed distances, the chainsaw motor shall be stopped while being carried by hand, or the chainbrake activated.

The chainsaw should always be carried at the side of the body with the bar pointing to the rear, so it can be thrown clear in case of a fall. It should not be carried on the shoulder.

The operator shall not operate a chainsaw above shoulder height.

3.1.5 Refuelling the chainsaw

The following rules shall be observed when refuelling.

1. Stop the motor.
2. Place the saw on clear ground.
3. Fill the oil tank first to allow the saw to cool down.
4. Avoid spilling fuel on hot engine components, as excessive heat can cause ignition.
5. Do not smoke or have any sparking or open flame near the fuelling point.
6. Refuel in an open space. Do not refuel in a closed area such as an elevating platform bucket. Fumes can collect causing an explosion or fire hazard.
7. When completed, wipe excess fuel from the saw.
8. Move at least three metres away from the refuelling site before restarting.

3.1.6 Use of chainsaws aloft

No person shall use a chainsaw for tree work unless they have fully demonstrated their competence and practical knowledge in chainsaw operation and tree climbing.

Chainsaws shall be secured when used in trees or on an elevating working platform unless there is danger of the chainsaw being trapped and taken with the severed section.

When operating the chainsaw while aloft a secure position at or above the level of the cut shall be adopted. The climber shall be attached by two anchor points when making cuts aloft.

Ensure that the saw is well clear of the operator and climbing equipment at all times. Obtain the best cutting position to minimise the risk of being struck by the saw (including kickback) or by severed pieces of wood.

A climbing saw shall be operated using two hands at all times or as per manufacturer's instructions.

The saw shall be stopped or the chainbrake activated while changing working positions.

Poor work positioning is not an acceptable reason for one-handed use. Incorrect one-handed 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.

3.2 Climbing techniques and equipment

All persons using climbing systems (including knots, hitches and equipment) shall be trained and competent in their use.

3.2.1 Knots in arboricultural operations

Any person tying knots for the use in arboricultural operations shall be competent and fully trained in the use of those knots.

Knot tying should observe the following rule.

1. Tie
2. Dress – align the parts
3. Set – tighten the knot and make ready for use

3.2.2 Climbing

Persons undertaking tree work aloft shall be competent and fully trained in the use of climbing equipment.

Whenever a climber is aloft, fall restraint should be used.

A visual hazard assessment on the tree including the rooted area shall be performed prior to climbing or performing any work in the tree.

Working techniques and work progression shall be fully discussed and understood by ground staff before climbing commences. Rescue procedures shall be outlined and understood. Ground staff should be able to effect an aerial rescue procedure if required.

Effective communication with at least one other person shall be maintained with the climber during arboricultural work.

The climber shall be securely attached to a suitable anchor point at all times while in the tree by means of climbing rope, safety line or lanyard. There shall be no more than 0.5 metres of slack in the climbing line at any time. (Note: a second anchor point is needed when cutting, as defined in 3.1.6.)

Anchor points should be above the work area. Anchor points shall be sufficient to take the climber's weight and equipment, and that of a potential rescuer. Anchor points shall also be able to withstand dynamic forces. The arborist line should be passed around the main leader or an upright branch. A false crotch may be used instead of or where a natural crotch does not exist.

Arborists shall be tied in or secured to the tree while ascending and remain tied in until work is completed and the arborist has returned to the ground. Supplementary anchor points shall be used where a fall or swing that may cause injury is possible. The exception to this is when a ladder is used to gain entry into the tree and the arborist shall not work from or leave the ladder until tied in or secured.

When climbing, the safety lanyard shall be never be unclipped except to bypass branches. In such circumstances a second safety lanyard or line shall be fastened free of the obstructing branch and checked for security before the first lanyard is unclipped.

Lanyards should have an effective means to prevent the friction hitch or device from slipping off the end of the lanyard.

When descending, ensure that the rope is as straight as possible and use both hands to control a smooth descent.

3.2.3 Climbing equipment

All climbing equipment shall comply with applicable safety standards.

Climbing equipment shall not be used for any other purpose and shall be replaced if worn, damaged or inoperative.

All equipment shall be used in compliance with the manufacturer's conditions or instructions.

No climbing equipment shall be marked for identification purposes (for example, engraving) or altered in any manner that undermines the structural integrity of that piece of equipment.

All carabiners used as part of a climbing system shall be rated at or above 22 kN and be auto-locking. An auto-locking carabiner upon closing, automatically moves into the locked position and requires a minimum of three distinct movements to open it.

Snap hooks (lanyard clips) used as part of the climbing system shall be rated at or above 22 kN and be auto-locking. An auto-locking snap hook, upon closing, automatically moves into the locked position and requires a minimum of three distinct movements to open it.

3.2.4 Climbing lines

Climbing lines shall be constructed with a breaking strain of 22 kN when new and be designed for the purpose of tree climbing.

All climbing lines shall be free of joining splices or knots. Spliced eyes or end splices shall be done in accordance with the rope manufacturer's instructions.

Climbing lines and equipment shall be stored dry in a suitable bag or box to prevent damage through contact with sharp tools, petrol, oil, excessive sunlight or chemicals.

Climbing lines running through crotches, over branches, through friction hitches, or through descenders create heat from friction. This heat can lead to rope failure. Always descend in a safe and controlled manner.

The safe working load (SWL) of a climbing rope and equipment is 10 percent of the breaking or tensile strength of the rope. Knots can weaken a rope by up to 50 percent of its breaking strength.

Where appropriate, a knot should be placed at the end of the line as a back-up to prevent the climber from descending off the end of the line.

Arborists shall check climbing lines, work lines, lanyards, and other climbing equipment for damage, cuts, abrasion and/or deterioration before each use and shall remove it from service if signs of excessive wear or damage are found.

Climbing line shall be only used for climbing.

3.2.5 Friction hitches

Friction hitches shall:

- move freely up and down the climbing line
- activate and hold on its own
- hold a climber's weight plus additional equipment while working aloft.

Friction hitches and work-positioning lanyards used in a climbing system shall meet the minimum strength standards for arborist climbing lines.

Climbers shall be aware of the characteristics and use of any friction hitch and/or friction system used for climbing and shall receive adequate training before use. Climbers shall be aware of how the friction hitch will perform in combination with other components, eg, a micro-pulley or cambium saver.

Climbers shall consider the fibre type, construction and cordage diameter when selecting a friction hitch as this will have a significant impact on the holding characteristics, abrasion resistance, heat and working life of the hitch.

Friction hitches should be constructed or tied with a minimum cordage diameter of 70 percent of the climbing line being used.

3.2.6 Safety harnesses

Work positioning (sit) harnesses are the most common harness used in tree climbing operations. They are designed to be connected at a pelvic attachment point and are used to support the climber in situations where the fall protection system is under tension.

Fall arrest harnesses are designed to arrest a worker's fall. The method of attachment between the harness and anchor point

usually incorporates some type of energy absorbing device which is usually attached via the chest or dorsal (upper back).

Harnesses shall conform to the relevant AS/NZS 1891 Standards or equivalent.

Only harness attachment points designed for load bearing support shall be used to connect the harness to the climbing system.

Harnesses shall not be altered in a manner that would compromise the integrity of the equipment.

Before use, arborists shall check all components of their harnesses for damage, cuts, abrasion and/or deterioration. Excessively worn or damaged components shall be replaced, or the complete harness shall be removed from service if signs of excessive wear or damage are found.

Harnesses should be kept in compartments or suitable containers while being transported to avoid harmful substances or damage and stored in the same manner as climbing lines.

3.2.7 Tree-climbing spurs (spikes)

All tree-climbing spurs shall be sourced from acknowledged suppliers and used as per the manufacturer's specifications.

Before use, climbers shall check all components for fractures or hairline cracks in the metal portions; misshapen, bent or loose spikes; cut or worn straps; pulled rivets; and damaged or worn buckles, rings and pins.

Excessively worn or damaged components shall be replaced or the complete spur shall be removed from service if signs of excessive wear or damage are found.

Spurs should be kept properly sharpened as per the manufacturer's recommendations.

3.2.8 Ladders

Improper use of ladders is a major work hazard. The most common causes of accidents are ascending or descending improperly, failure to secure the ladder, holding objects while ascending or descending, or structural failure of the ladder.

All ladders shall comply with an appropriate industrial standard. For example:

- *NZS 3609:1978 Specification for timber ladders*
- *ANSI A14.1-1982, Ladders – Portable wood*
- *NZS 5233:1986 Specification for portable ladders other than timber*
- *ANSI A14.2-1990, Ladders – Portable metal*

Ladders made of metal or other conductive material shall not be used where electrical hazards exist. Only non-metallic ladders equal to or exceeding the strength of wooden ladders shall be used.

Only ladders specifically designed as a working platform shall be used to work from. Other ladders may be used for access and egress.

3.2.9 Ancillary equipment

All ancillary equipment (eg, carabiners, descenders, rings and webbing etc) used in climbing operations shall be rated to a minimum of 22 kN.

Always use equipment fit for purpose to the manufacturer's instruction.

All carabiners should be locked when in use.

Check ancillary equipment for physical damage such as significant dents or distortion, cracks or forging folds, weak pivots or springs and remove from service if signs of excessive wear or damage are found. Do not modify or repair equipment.

A suitable container shall be provided to protect equipment and prevent contact with cutting tools, chemicals or other hazards while in storage or transit.

Maintain and clean equipment in accordance with the manufacturer's instructions.

3.3 Tree pruning

3.3.1 General provisions

Effective communication shall be established between the arborist in the tree and the ground crew before cutting and/or dropping branches.

In a climbing situation, the climber should be positioned at or above the branch to be worked on.

Avoid situations where there is a likelihood of the branch kicking back or striking the operator.

A separate lowering line shall be attached to limbs that cannot be dropped safely or controlled by hand. Arborist climbing lines and lowering lines shall not be run through the same crotch.

Partially cut branches or hangers shall not be left unsecured in trees upon completion of work.

Commonly accepted tree pruning standards include ANSI A300, BS 4373, and BS 3998.

3.3.2 Handsaws

The free hand should be held clear of the saw and cuts are to be made away from the body.

Handsaws should have a suitable guard or scabbard complete with some means of attachment to the worker's belt for working aloft.

3.3.3 Pole pruners

Manual pole pruners, pole saws and other similar tools with poles made of metal or other conductive material shall not be used in where there are electrical hazards from power lines. (See section 2.2.11 Avoiding electrical hazards.)

If raising or lowering pole pruners for tree work aloft, attach the rope to the end of the tool so it is less likely to be caught in branches. The rope shall be attached below the cutting jaws and not tied to or run through.

3.3.4 Mechanical pruning

Where mechanical pruners are used, the safety specifications as recommended by the manufacturer shall apply.

3.4 Tree felling

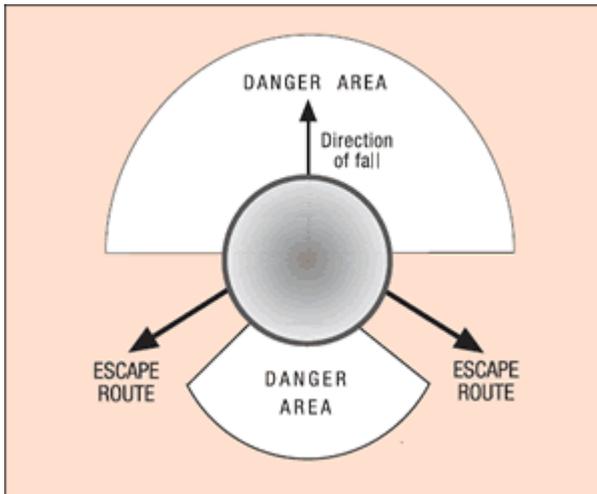
3.4.1 General provisions

Before beginning any tree removal operation, the chainsaw operator and/or crew leader shall carefully consider the following conditions to eliminate, isolate or minimise any potential hazards. The planning process to address tree and site factors shall identify appropriate actions to ensure a safe removal operation.

Planning should take into account the following things.

- Surrounding areas including other trees and the tree to be removed
- Species, shape and condition of the tree
- Lean of the tree
- Broken branches, deadwood or other overhead material that may dislodge during the felling process
- Wind force and direction, and other climatic factors
- Decayed or weak spots throughout the tree (be aware of additional hazards if these conditions exist in the hinge area)
- Location of, and means to protect, other persons, property and over-head and below-ground utilities. See Sections 2.2.11 and 2.2.12 of this code for the avoidance of hazards from overhead and underground power lines and other services
- Size and terrain characteristics or limitations of the work area
- When it is necessary to shorten or remove branches before dropping the tree, the arborist shall attempt to determine if the tree can withstand the strain of the lowering

procedures. If not, other means of removing the tree should be considered



All felling operations shall be undertaken by a competent person fully experienced in the work to be carried out. The person in charge of felling operations shall exercise control and supervision of the work to ensure adequate safety precautions are being observed.

Special care should be taken when felling dead trees, as parts may fall into the work area as the tree falls.

An escape route shall be planned and kept clear of tools and other material that would impede a quick exit. The ideal escape route is 45 degrees on either side of a line drawn opposite the intended direction of the fall.

A pulling line should be attached to all trees and stems being felled to provide directional pull where assisted directional felling is required.

Particular care should be taken when felling uphill or on steep slopes as this creates extra hazards with trees likely to roll or slide back towards the operator.

People not directly assisting with the felling operation shall remain at a safe distance (at least two tree-lengths) from the tree being felled.

Where the size of tree being felled has the potential to cause harm, wedges, block and tackle, rope, wire cable or other appropriate devices shall be used. All limbs shall be removed to a height and width sufficient to allow the tree to fall clear of any objects in the vicinity.

Where any electrical hazard exists refer to the Trees Code Part 2.

Wedges and driving tools should be readily available during all felling operations.

3.4.2 Felling operations

Wherever possible, trees shall be felled towards a clear open space.

All scarfing and back-cutting shall comply with the accepted felling methods in section 3.4.3 and 3.4.5.

When felling of a tree is started, the scarf and back-cut shall be completed before starting on the next tree.

Where a tree is "hung-up" or "cut-up" it shall be brought to the ground as soon as possible, and before operations continue. A hung-up or cut-up tree shall not be left standing, nor shall the feller leave the area before the tree has been brought to the ground, other than to seek assistance to do so. The person in charge shall be notified and additional precautionary planning done.

No person shall move forward within two tree-lengths of the intended direction of fall of any hung-up or cut-up tree, or the direction of fall of any hung-up tree.

No machine shall operate within two tree-lengths of any felling operation while felling is in progress, or forward of any hung-up or cut-up tree, unless to assist, under adequate supervision, in safely bringing the tree to the ground.

3.4.3 Accepted felling methods

Scarf cuts shall be used on all trees and trunks over 125 mm in diameter at breast height.

The two cuts that form the scarf shall not cross at the point where they meet.

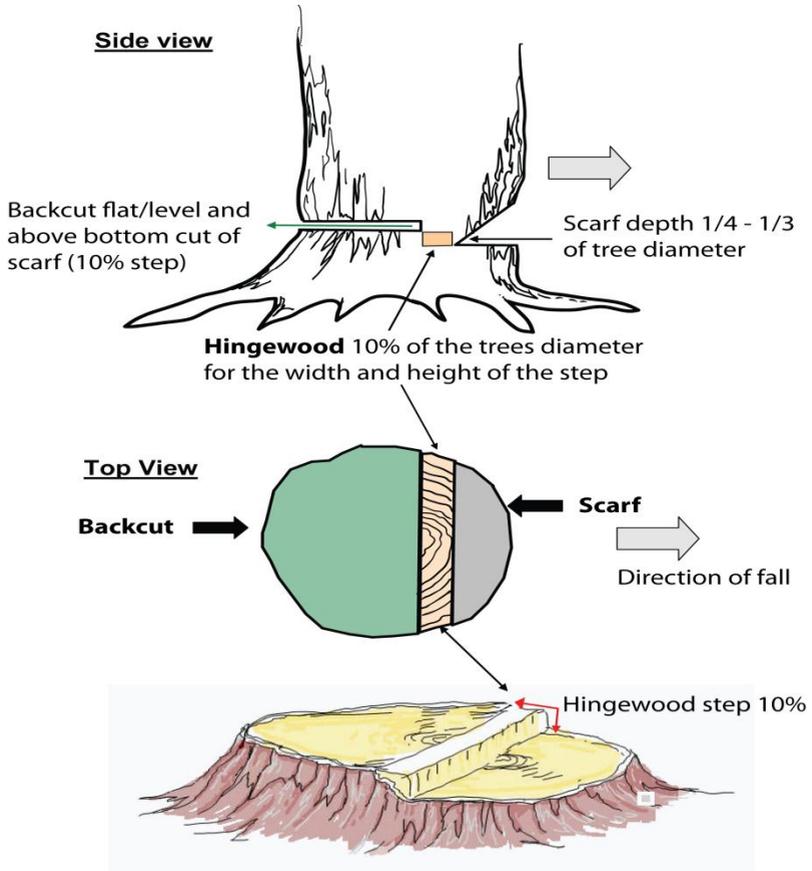
Scarf and back cuts shall be made at a height above the highest ground level to enable chain saw operators to safely begin the cut, control the tree or trunk and have freedom of movement for escape.

The scarf cuts used shall be either a conventional, open-face, or Humboldt cut.

Scarf cuts should be 45 degrees or greater and large enough to guide the fall of trees and trunks to prevent splitting.

Scarf cuts depth should not exceed one-third of the diameter of the tree.

The back cut shall not penetrate into the predetermined hinge area.



Before commencing the back cut, there shall be a command such as "stand clear" from the arborist operating the chain saw and a response such as "all clear" from the workers supporting the removal operation. Pre-arranged hand signals may also be used. Only designated persons shall give such signals. All workers in the vicinity shall be out of range when the tree or trunk falls. Visual contact should be maintained with the tree or trunk until it is on the ground.

3.4.4 Tree dismantling and rigging

This operation involves dismantling and rigging trees by cutting into manageable sections where the situation does not allow felling by conventional techniques.

No person shall carry out tree dismantling unless they have fully demonstrated their competence and knowledge of tree dismantling techniques.

Effective communication shall be maintained between the arborist in the tree and the ground crew before cutting and lowering branches.

The climber shall ensure a safe working position is adopted prior to any cuts being made and shall comply with sections 3.1.6, 3.2.2 and 3.4.3 of this code.

In roping down and slinging, the weight of sections to be removed should be carefully assessed to ensure the selected lowering point and ropes shall not exceed safe working loads.

3.4.5 Felling against the lean of the tree (back-pulling)

All persons carrying out a back-pulling operation shall be competent or training under adequate supervision. Machinery and equipment shall be adequate to handle all aspects of the operation. Use of such machinery shall be for its intended purpose and in accordance with the manufacturer's instructions.

The faller and machine or equipment operator shall have an effective means of communication. This may require the use of an intermediary in some circumstances.

The rope should be secured as high as practicable on the tree, having regard for tree size, lean and height, and the pulling capacity of the machine or equipment.

If two tree-lengths' clearance is possible, the tree may be pulled towards the machine or point of equipment anchor.

3.4.6 Winches, wire ropes and accessories

Major operations should be carried out in accordance with the *Approved Code of Practice for Safety and Health in Forest Operations* or other relevant code(s) of practice.

Wire ropes, gears, chain drives and other parts shall be inspected in accordance with the manufacturer's instructions and guidelines, and removed from service if signs of excessive wear or damage are found.

Tackle blocks, pulleys and their connecting links, chokers, slings or other means of attachment shall be inspected before use and shall be removed from service if signs of excessive wear or damage are found.

No person shall remain in the bight of any working operating rope.

The use of knots in any wire rope is prohibited.

Line pull shall not exceed the SWL of the rope or its accessories. For all arboricultural operations, the SWL shall be one-sixth of the breaking strength.

Wire rope

All wire ropes shall comply with *NZS/BS 302 Part 5 Specification for ropes for hauling purposes*. No wire rope shall be used in an arboriculture operation unless the manufacturer or vendor has certified it as to its breaking strength.

Eye-to-eye splices shall not be made in any pulling or lifting rope. Only long splices or butt splices are to be used in joining such ropes.

Winching

Hand winch, machine winch and hauling machine operators shall be competent and conversant with all facets of winching operations.

Where two persons have applied the load to a hand winch handle or lever, two persons shall be used to release the load.

The tree feller shall, before felling commences, advise winch and machinery operators as to what is required in terms of line

tension, winching and pulling speeds. Visual signals and vocal commands shall be determined before felling starts.

When using a stump as a ground anchor or to secure pulling blocks, the stump shall be of sufficient size and stability for the winching operation.

Strops used to anchor winches or pulling blocks shall be at least 1.5 times the SWL of the pulling rope.

3.4.7 Windthrow

Windthrown trees are those that have been blown down, have become unstable or have been significantly damaged by wind action. These provide additional hazards that require having more than one person working on the site at all times.

When a tree is resting on its upturned roots the worker shall ensure that the cut is made in such a manner that neither the feller nor other workers are in a position of danger from movement of either the root mat or the log.

3.5 Machine operations

3.5.1 Chippers and Grinders

Personnel safety

All persons operating wood chippers and or stump grinders shall be provided with protective clothing and training in the use of these machines.

All persons operating chippers and or stump grinders shall comply with the manufacturer's instructions. All chipper and grinder equipment shall be equipped and maintained with all manufacturer's safety devices, instructions, warnings and safeguards. Arborists and other workers shall follow instructions provided by manufacturers.

Operators shall not leave a running machine unattended.

Persons not engaged in the operation shall not be allowed in the vicinity of an operating chipper. The guidelines on public safety detailed in section 2.2.13 should be followed where practicable.

General

Prior to daily use of all chipper and grinder equipment, a visual inspection and operational checks shall be made in accordance with the manufacturer's instructions.

When feeding the chipper, operators shall keep the face and body away from the infeed opening and not allow hands or arms inside the infeed hopper. Stand to the side of the cutters to avoid particles thrown back.

Materials should be pre-trimmed to fit easily into the infeed area. Materials stuck or lying in the area shall be released or fed in with a wooden push stick or suitable branch.

Operators shall stand clear of the discharge opening while the equipment is running.

Operators shall ensure that the discharge is safely directed or confined to prevent injury or damage.

All chippers and grinders shall be turned off, keys removed and rotating parts at rest prior to making repairs or adjustments, except where manufacturers' procedures require otherwise. Defects or malfunctions affecting the safe operation of equipment shall be corrected before placing such equipment into use.

No person shall, under any circumstances, reach into the infeed hopper when the cutter disc, rotary drum or feed rollers are moving, unless the chipper is turned off, key removed and locking pins in place, and all other moving parts have stopped moving.

Access panels for maintenance and adjustment including discharge chute and cutter housing shall be closed and secured prior to starting the engine of chippers.

Chippers equipped with a mechanical infeed system shall have a quick stop and reversing device on the infeed system. The activating mechanism for the quick stop and reversing device shall be located close to the feed end of the infeed hopper within easy reach of the worker.

Rotary drum or disc chippers not equipped with a mechanical infeed system shall be equipped with an infeed hopper of sufficient height and length so as to prevent workers from contacting the blades or knives during operations.

Rotary drum or disc brush chippers not equipped with a mechanical infeed system shall have a flexible anti-kickback device installed in the infeed hopper to reduce the risk of injury from flying chips and debris.

Keys shall be removed from the ignition when equipment is left unattended.

When in a towing position, chipper safety chains shall be attached as per the manufacturer's instructions and in accordance with transport regulations.

Care should be taken to ensure that chipper exhaust systems do not present a fire hazard.

3.5.2 Mobile elevating work platforms (MEWP)

General provisions

All mobile elevating work platforms used shall have an engineer's certificate stating the work and loads that particular platform is capable of and that it meets the requirements of the *Best Practice Guidelines for Mobile Elevating Work Platforms*.

All work platforms shall be visually inspected and checked in accordance with the manufacturer's instructions prior to daily use.

Work platforms shall be operated by a competent operator and in accordance with the manufacturer's instructions and the *Best Practice Guidelines for Mobile Elevating Work Platforms*.

All elevating work platforms shall be provided with a point of attachment to secure a fall-arrest harness with a shock-absorbing lanyard. Operators working from an MEWP shall be tied in at all times while aloft.

Elevating work platforms shall not be used as cranes or hoists to lift or lower materials unless specifically designed by the manufacturer to perform such operations.

Operators shall not exceed the SWL of the platform.

Elevating work platforms shall not be used within the vegetation management zone without written consent from the power line owner. (See section 2.2.11 Avoiding electrical hazards.)

Do not use the platform over workers or allow workers access under the platform.

A chainsaw shall not be started inside a bucket or platform unless a fixed starting bracket is fitted to the bucket walls or platform guardrails, so that the bar and chain are outside the working area when the saw is started. Otherwise, the saw shall be warmed up on the ground and started outside the bucket.

Where two workers may be operating from a bucket, only one chainsaw shall be operated at a time with the second worker remaining clear from the chainsaw worker.

When using an MEWP for tree access and egress, operators may use work positioning harnesses incorporated with a travel restraint system.

Transfers between elevated buckets and other work positions (trees) aloft are discouraged. Other access methods that eliminate fall risks should be used where practicable. However, where such transfer is essential for the work, the transfer shall be managed and fall protection provided.

The following minimum guidelines apply.

Pre-operation

- The transfer is planned and the climber, MEWP operator and other work team members are prepared for it.
- There is an alternative means of descent available from the external work position (tree).
- The proposed transfer point to the external work platform or other work position (eg, tree foot/hand hold point) is

well within the vertical and horizontal reach of the MEWP bucket.

- The MEWP is checked as being stable for the transfer and the extent of any boom deflection is anticipated in the transfer.

The transfer process

- The bucket floor is displaced no more than 300 mm vertically from the standing or foothold surface of the external work position (tree) during the transfer, and, if the bucket is positioned adjacent to the external work position (tree) the horizontal gap between the two should be no more than 100 mm.
- Attaching and detaching height safety equipment during the transfer is always done from the work position within the bucket. The process requires the anchor point in the tree to be installed and set then attached to the harness immediately, followed by the removal of the MEWP attachment.

3.5.3 Cranes and related hoists

Operators of hoisting equipment shall be trained and comply with the *Approved Code of Practice for Cranes*. When identifying hazards, note especially any electrical hazards and ensure cranes maintain separation from overhead power lines provided for in section 2.2.11 of this code.

Boom angle indicators shall be maintained on telescopic cranes, when provided by the manufacturer.

Operators of hoisting equipment shall remain at the controls while a load is suspended.

Wire ropes, gears, chain drives and other parts shall be inspected in accordance with applicable standards as well as the manufacturers' instructions and guidelines. Chokers, slings or other means of attachment shall be inspected before use and removed from service if signs of excessive wear or damage are found.

Riding the load line of a crane while it is under load tension shall be prohibited.

A qualified arborist may be hoisted into position utilising the crane, provided that he/she is tied in with an arborist climbing line and arborist harness and secured to a designated anchor point on the boom or line.

The following procedures shall be followed when an arborist is to be lifted by a crane.

The person specifically responsible for the work shall authorise the use of a crane only when he/she has determined that it is the safest and the most practical way to perform the work or gain access to the tree.

Such authorisation should be made in writing and be retained at the job site.

The crane operator shall be familiar with the potential hazards and operational techniques encountered in tree work.

The arborist climbing line shall be secured to the crane in such a way that it does not interfere with the function of any damage-prevention or warning device on the crane, and so that no part of the crane compromises the climbing line or any other component of the climbing system.

The arborist shall check for any sprags on or near the point of attachment that may damage or compromise the function of the climbing line.

The crane operator and the person responsible for the work to be performed shall meet prior to the work to review procedures to be followed. If the work involves a signal person and/or arborist being lifted in addition to the person responsible for the work, they shall participate in the review.

Communication between the crane operator and the arborist being lifted shall be maintained either directly or through the appointed signal person.

The crane shall be supported on a firm surface and maintained in a level position. The crane operator shall use blocking or other means if necessary so that the support medium does not exceed its load-bearing capabilities. When provided, outriggers shall be

extended and properly set. Lifting of arborists shall not be permitted when the crane is supported solely on its tires.

The crane operator shall test the adequacy of footing prior to any lifting.

The lifting and supporting shall be made under controlled conditions and under the direction of the arborist or an appointed signal person.

The crane operator shall remain at the controls when the arborist is attached to the crane.

The crane boom and load line shall be moved in a slow, controlled, cautious manner with no sudden movements when the arborist is attached. The lifting or lowering speed shall not exceed 0.5 metres/second. The crane shall be operated so that lowering is power-controlled.

The crane carrier shall not travel at any time while the arborist is attached.

Cranes shall not be used within the vegetation management zone without written consent from the power line owner. (See section 2.2.11 Avoiding electrical hazards.)

3.5.4 Helicopters

The majority of this section has been taken directly from the *Approved Code of Practice for Safety and Health in Forestry Operations*. Complete copies of this code are available from the Ministry of Business, Innovation and Employment website at www.osh.dol.govt.nz/order/catalogue/pdf/forest-a.pdf.

Pilots shall hold a current valid licence and appropriate rating for specialised work.

A briefing on safety between the pilot, controllers and workers shall be held before operations commence.

Procedures shall be established before operations commence to ensure that alternative communication methods are available should radio communication fail or become unclear.

Hand signals shall be in accordance with the instructions issued by the pilot.

An appropriate area shall be allocated for refuelling. The pilot shall be responsible for safety procedures during refuelling and ensuring compliance with:

- Civil Aviation Rule 135.73
- Dangerous Goods Act 1974
- Dangerous Goods Regulations 1985.

Strops or taglines used shall have an ultimate breaking strength three times their safe working load and shall be regularly inspected for wear.

Any worker shall wait for a signal from the pilot before entering, leaving, loading, unloading connecting or disconnecting anything from a helicopter.

All workers shall:

- remain clear of the immediate vicinity of a helicopter that is hovering (unless unavoidable)
- keep clear of the rotors
- stay in full view of the pilot (ie, stand forward of the helicopter)
- not approach or leave a starting up or closing down helicopter
- not approach a helicopter from the downhill side
- not go near the rear of the helicopter.

Operations involving suspension of persons below the helicopter, including injured persons, shall be conducted in compliance with Civil Aviation Rule 133.

While riding in the helicopter, seat belts shall be fastened until the pilot signals for passengers to exit.

Where safety helmets are worn in helicopter operations, they shall be provided with a means of preventing them from being blown off such as a chin strap or by wearing ear muffs attached to the helmet.

4 Appendices

4.1 A summary of the Health and Safety in Employment Act 1992

This summary of the Act focuses on the aspects that are relevant to working in arboriculture. While it provides some advice as to the interpretation of the Act, it should not replace legal advice and if you have any queries, seek assistance from a health and safety professional and/or legal counsel as appropriate.

4.1.1 The Act

The object of the Act is to prevent harm to all people at work and people in the vicinity of a place of work.

The Act does this by:

- promoting excellence, particularly through systematic management of health and safety
- defining harm and hazards in a comprehensive way
- imposing duties on those who are responsible for work, or do work
- setting requirements that relate to taking all practicable steps to ensure health and safety, and ensuring that the requirements are flexible to cover different circumstances
- recognising employee participation in health and safety management and that the process is conducted in good faith by all those involved.

The Act creates duties for most people connected with places of work, including:

- employers
- employees (including trainees, people gaining work experience and volunteers)
- the self-employed
- principals to contractors and employees of contractors and subcontractors
- persons who control a place of work

- hirers, sellers and suppliers of plant.

4.1.2 Regulations

Regulations are promulgated from time to time under the Act. Regulations may, among other things, impose duties on employers, employees, designers, manufacturers and others relating to health and safety. These regulations may apply to places of work, plant, processes or substances, and may deal with particular problems that have arisen.

The Health and Safety in Employment Regulations 1995 require the provision of facilities such as toilets, first aid, facilities for employees to wash, a place to have meals and the provision of wholesome and sufficient drinking water. The regulations also set a range of general health and safety and welfare requirements in addition to the Act, including:

- restricting young people from certain hazardous work and times of work
- requiring certification of workers using some hazardous equipment
- requiring notification of particular types of hazardous work, including forestry and construction
- creating duties for the designers, manufacturers and suppliers of plant and protective clothing and equipment.

4.1.3 Approved codes of practice (section 20)

Approved codes of practice are provided for in the Act. They are statements of preferred work practice or arrangements, and may include procedures which could be taken into account when deciding on the practicable steps to be taken. Compliance with codes of practice is not mandatory. However, compliance with an approved code of practice may be used in court as evidence of an employer or other duty holder having taken "all practicable steps" to meet the duty.

4.1.4 Employers' duties (section 6)

Employers have a general duty to take all practicable steps to ensure the safety of employees while at work. In particular, they are required to take all practicable steps to:

- provide and maintain a safe working environment

- provide and maintain facilities for the safety and health of employees at work
- ensure that machinery and equipment are safe for employees
- ensure that working arrangements are not hazardous to employees
- provide procedures to deal with emergencies that may arise while employees are at work.

Taking all practicable steps means doing what is reasonably able to be done in the circumstances, taking into account:

- the severity of any injury or harm to health that may occur
- the degree of risk or probability of that injury or harm occurring
- how much is known about the hazard and the ways of eliminating, reducing or controlling it
- the availability, effectiveness and cost of the possible safeguards.

A person is required to take all practicable steps in respect of circumstances that they know or ought reasonably to know about.

4.1.5 Employees and health and safety representatives (section 12)

Before employees begin work, they must be informed by their employer of:

- hazards they may be exposed to while at work
- hazards they may create which could harm other people
- how to minimise the likelihood of these hazards becoming a source of harm to themselves and others
- the location and correct use of safety equipment
- emergency procedures.

Employers are also required to inform employees of the results of any health and safety monitoring. In doing so, the privacy of individual employees must be protected.

Where there are employee health and safety representatives, the employer must ensure that the representatives have ready access to sufficient information about health and safety systems and

issues in the place of work to enable them to be able to carry out their functions effectively.

4.1.6 Training and supervision of employees (section 13)

An employer must ensure that every employee has the knowledge and experience required to do the work – or is supervised by someone who has – so that they are not likely to suffer harm, or lead to the harm of others. This includes every employee who:

- does work of any kind
- uses plant of any kind
- deals with a substance of any kind in a place of work.

Every employee must be adequately trained in the safe use of all plant, objects, substances, protective clothing and equipment that they are, or may be, required to use or handle.

4.1.7 Responsibility for employees' work activities (section 15)

Employers are also responsible for the health and safety of others arising from the work activities of their employees. They must take all practicable steps to ensure that no action or inaction of an employee while at work causes harm to any other person.

4.1.8 Persons in control of a place of work (section 16)

The Act places duties on persons who control a place of work in relation to people in the vicinity, and to visitors.

A person who controls a place of work includes a person who owns, leases, subleases or occupies a place of work, or who owns, leases or subleases plant or equipment used in a place of work.

4.1.9 Duties of the self-employed (section 17)

Every self-employed person shall take all practicable steps to ensure that no action or inaction of theirs while at work harms the self-employed person or any other person.

4.1.10 Duties of principals (section 18)

Principals engaging contractors are required to take all practicable steps to ensure that no employee of a contractor or subcontractor, or if an individual, no contractor or subcontractor is harmed while doing any work (other than residential work) that the contractor was engaged to do.

4.1.11 Hirers, sellers and suppliers of plant (section 18A)

The Act places duties on people to ensure that any plant or equipment that is used in a place of work is designed and made, and has been maintained, so that it is safe for its intended use.

The duties apply to people who:

- hire, lease or lend plant to another person that could be used in a place of work
- sell or supply plant (other than for hire, lease or loan)
- install or arrange plant in addition to either of the above.

4.1.12 Duties of employees (section 19)

Every employee shall take all practicable steps to ensure:

- their own safety while at work (including using protective clothing and equipment)
- that no action or inaction of theirs while at work causes harm to any other person.

Employees have a right to refuse to undertake work that they consider likely to cause them serious harm. However, employees have an obligation to attempt to resolve the matter with their employer.

4.1.13 Deemed employees

People receiving on-the-job training or work experience, loaned employees and volunteer workers are all deemed to be employees of an employer or self-employed person for whom they are working. Most employer duties apply, but not the duty to provide opportunities for employee participation.

4.1.14 Opportunities for employee participation (Part 2A)

Employers must provide reasonable opportunities for employees to participate effectively in on-going processes for the improvement of health and safety in the place of work. Where there are more than 30 employees, or where an employee or union representing employees requests it, the employer must seek agreement on, develop, implement and maintain a system of employee participation. Where agreement cannot be reached on the system of employee participation, there are default provisions set out in the Act.

Where employee health and safety representatives are elected, they are entitled to paid leave to attend approved training courses.

A trained employee health and safety representative may issue a hazard notice to an employer where they believe there is a hazard in the place of work, they have brought it to the employer's attention and the issue has not been resolved.

Employers and employees must deal with each other in good faith while seeking agreement on, developing and maintaining a system of employee participation.

4.1.15 Notification of particular hazardous works (section 23 of the Regulations)

This section refers to the Regulations. There are some activities that are considered by their very nature to be particularly hazardous. This work may have additional requirements to ensure worker safety. These requirements may include items such as licensing, registration and certificates of competence.

Section 26 of the Health and Safety in Employment Regulations 1995 outlines the requirement to notify the Ministry of Business, Innovation and Employment if you are undertaking one of these activities. A form for this purpose can be found on the Ministry's website at

<http://www.osh.dol.govt.nz/services/notification/index.shtml>

4.1.16 Accidents, serious harm and notification (sections 25 and 26)

The Act requires employers, the self-employed and principals to contractors to keep a register of work-related accidents and serious harm.

For employers, this includes every accident that harmed (or might have harmed):

- any employee at work
- any person in a place of work controlled by the employer.

Employers are also required to investigate all accidents, harm and "near misses" to determine whether they were caused by a significant hazard. Serious harm is defined in Schedule 1 of the Act.

Any occurrences of serious harm of a kind that must be recorded shall also be notified to the Secretary of Labour (in practice, the nearest Ministry of Business, Innovation and Employment office) as soon as possible after the occurrence becomes known to the employer. In addition, the accident must also be reported in the prescribed form within seven days. (Forms are available from the Ministry's website at <http://www.osh.dol.govt.nz/services/notification/index.shtml>)

If a person suffers serious harm, the scene of the accident must not be interfered with unless to:

- save the life of, prevent harm to, or prevent suffering to, any person
- maintain public access for essential services, eg, electricity, gas
- prevent serious damage or loss of property.

A health and safety inspector will advise whether or not the Ministry of Business, Innovation and Employment will investigate the accident and what action may be taken in the meantime.

4.2 Relevant Acts, codes and standards

4.2.1 Legislation

Health and Safety Employment Act 1992
Health and Safety in Employment Regulations 1995 (and subsequent amendments)

Traffic Regulations 1976
Rules made under the Land Transport Act 1993 which replace or supersede the above Regulations
Civil Aviation Rule 133 and 135.73
Hazardous Substances and New Organisms Act 1996
Resource Management Act 1991

4.2.2 Approved codes

Approved Code of Practice for Safety and Health in Tree Work Part 2: Maintenance or Removal of Trees around Power Lines 1996 (Trees Code 2) and subsequent versions
Approved Code of Practice for Safety and Health in Forest Operations
National Code of Practice for Utility Operators' Access to Transport Corridors

4.2.3 Standards

BS: 3998-1989 and Amendment 6549-1990 (Tree Works)
ANSI: A300 Parts 1-3 Tree pruning standard
NZS 5819:1982 Chainsaw Safety, reconfirmed 1989
AS/NZS 1891.1:1995 Industrial fall arrest systems and devices, Part 1 Safety belts and harnesses (and subsequent amendments)
AS/NZS 1891.4 Industrial fall-arrest systems and devices Part 4: Selection, use and maintenance
AS/NZS 1801:1997 Occupational protective helmets
NZS/AS 1270:1988 Acoustics – Hearing protectors
AS/NZS 1337:1992 Eye protectors for industrial applications, Amendment 1 September 1994 (and subsequent amendments)
AS/NZS 4453.3: 1997 Protective clothing for users of hand-held chainsaws, Part 3, Protective legwear
AS/NZS 2210 Occupational protective footwear, Part 1
NZS/BS 302 Part 5 Specification for ropes for hauling purposes
NZS 3609:1978 Specification for timber ladders

ANSI A14.1-1982, Ladders - Portable wood
NZS 5233:1986 Specification for portable ladders other than timber
ANSI A14.2-1990, Ladders - Portable metal

This list provides a guide to some of the broadly applicable Acts, codes and standards that are relevant to arboricultural operations and procedures. It is by no means definitive.



⇒ More information

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