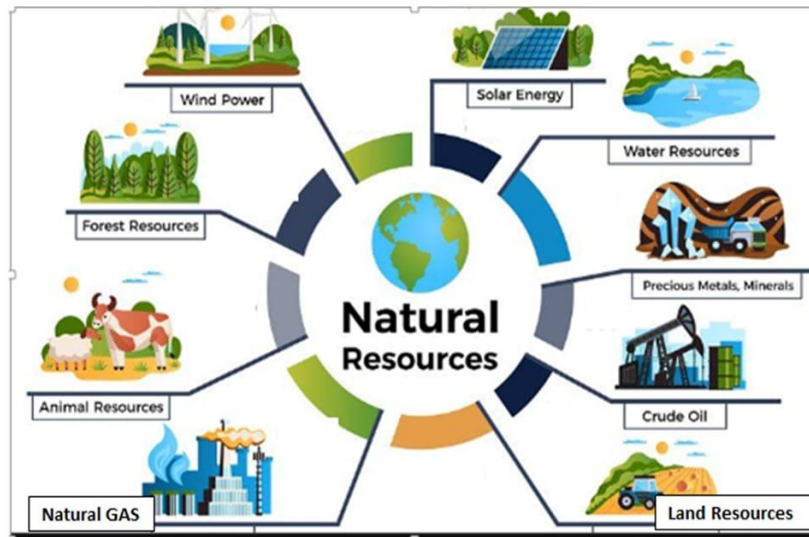


NATURAL RESOURCES CONSERVATION AND DEVELOPMENT

Level-I

Based on March 2022, Version1 Occupational standard



Module Title: - Performing Arboriculture Work

LG Code: AGR NRC1 M06 LO (1-6) LG (29-34)

TTLM Code: AGR NRC1 TTLM 0922v1

September, 2022

Addis Ababa, Ethiopia

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Introduction to the Module

In forest field; the arboriculture activity helps to know the Preparation for ground support operations, Rope operation, maintain a clear work site during operations and to provide ground support for tree climbers for forest field

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LG #29

LO #1-Prepare for ground support Operations

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Introduction to the module
- Receiving and clarifying instructions
- Identifying OHS hazards
- Selecting tools, equipment and machinery
- Carryout pre-operational and safety checks
- Selecting, checking, using and maintaining suitable safety equipment and PPE

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Follow clear instructions Methods
- Identified OHS hazards
- Carry out tools, equipment and machinery Selection
- Carryout pre-operational and safety checks
- Apply and check safety equipment and PPE Selection

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks
- Perform Operation Sheets
- Do the “LAP test”

Introduction

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Arboriculture: is the cultivation, management, and study of individual trees, shrubs, vines, and other perennial woody plants. Or can be defined as: The art, science, technology and business of utility, commercial and municipal tree care.

Arborist or arboriculture: is a professional in the practice of arboriculture.

Arborist -a person possessing the technical competence through experience and related training to provide for or supervise the management of trees and other woody plants in the residential, commercial and public landscape.

Arborists generally focus on the health and safety of individual plants and trees, rather than managing forests. An arborist's work may involve very large and complex trees, or ecological communities and their abiotic components in the context of the landscape ecosystem. These may require monitoring and treatment to ensure they are healthy, safe, and suitable to property owners or community standards.

The overall goal of arboriculture is to combine modern technology and skills in order to care for trees in a way that is scientifically sound. This includes employing risk management techniques and planting trees to present the greatest profit.

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Information Sheet 1

1.1. Receiving and clarifying Work instructions

Effective Instructional communication means to give and receive accurate, timely and relevant information and encourage opportunities for feedback. Hence, Instructional communication includes elements that would facilitate the effective sending and receiving of timely and accurate information and feedback.

In ground support operations, there are informal methods of Instructions, such as conversations between workers, and formal methods such as memos from the management. These different methods allow information to reach the right people and help ground support operations towards its goals. In order to **receive and clarify instructions**, a person does need to be able to listen and speak clearly and present ideas in a logical, well ordered manner. However, another factor is also extremely important if instruction is to be effective. A good receiver is a good listener and observer. Unless a person listens and observes to what is being said and, no instructions actually takes place.

In order to receive instructions, gather information and follow instructions correctly, you need to practice effective listening.

In the workplace, effective listening helps you to:-

- understand instructions clearly
- learn from others
- convey clear messages
- promote good listening in others (if you are prepared to listen to others, they will be prepared to listen to you)
- offer ideas and take part in discussions
- co-operate with others and work well in a team
- understand the ideas and suggestions of others
- respond in an appropriate manner.

Four-part criteria against which work instructions can be evaluated and improved as needed. As a first step in judging the overall effectiveness of work instructions, managers can examine their work instructions against four essential characteristics: credible, usable, accessible and consistent.

- **Credible: Workers Trust Them**

Credible work instructions are at the heart of standardized best practices. In a workplace that's committed to one and only one way to perform all procedures and processes, work instructions must define that standard. When work instructions are credible, workers accept and trust them. But it's easy for work instructions to lose their credibility. A common way to lose credibility is when standard procedure updates and changes get passed on verbally and there are consistent and regular delays in updating the written work instructions. With verbal changes, something can be missed or an individual can otherwise fail to get the correct message. In a busy workplace with frequent undocumented changes and updates, work instructions become marginalized with workers no longer trusting them as being accurate.

- **Clear: Workers Understand Them**

A clear work instruction can be quickly understood by the worker with a minimum of effort. To accommodate the typical worker, an ideal work instruction explains mostly with graphics using only minimal clarifying text. Illustrations or other graphic support should be immediately visible and the worker should not be required to go to any other location for supporting information.

- **Accessible: Workers Can Get To Them**

Work instructions are accessible when they can be located quickly and easily. "Quickly" means within seconds and "easily" requires a retrieval system that the worker knows, understands and trusts.

- **Consistent: They Match Worker Training**

Consistent work instructions conform to a style guide developed specifically for procedures and work instructions. There must be rigid consistency of terminology so that the same word means the same thing every time. There can be no undefined acronyms and confusing technical terms. All instructions should follow the same format so that the user always knows where to find information such as required tools or control settings.

- **Clarifying work in arboriculture**

✓ Arboriculture Worker

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The arboriculture assistant's job is-for many-the beginning of a career in the arboriculture industry. Work is carried out under direct supervision and could include:

- ✚ providing support for other workers
- ✚ operating and maintaining chippers and chainsaws
- ✚ watering trees and shrubs
- ✚ setting up traffic control signs for barriers
- ✚ loading, unloading and maintaining equipment

✓ Arboriculture Supervisor

Arboriculture tradespersons are skilled workers in the arboriculture industry. Their work could include:

- ✚ Felling large trees
- ✚ Tree climbing
- ✚ Using specialist machinery supervising tree planting coordinating tree pruning and maintenance programs aerial rescue

✓ Arboriculture Manager

An arboriculture supervisor has responsibility for a number of workers and arboriculture activities. Work undertaken by an arboriculture supervisor could include:

- ✚ supervising and training staff
- ✚ planning the removal of trees
- ✚ developing a tree pruning program
- ✚ planning tree planting, transplanting or protection programs
- ✚ supervising machinery maintenance and supplies and services
- ✚ costing projects and operating a budget

1.2. Identifying OHS hazards

Hazard: a physical situation with a potential for human injury, damage to property, damage to the environment or some combination of these. So safety checks are important to avoid injury and damage in a work place.

OHS Hazards may include protection from:

solar radiation, dust, noise, air and soil-borne microorganisms, chemicals and hazardous substances, sharp hand tools and equipment, manual handling, holes, trenches, slippery and uneven surfaces, electricity and overhead hazards including power lines.

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To protect workers from the above mentioned hazards, one has to use personal protective equipment/device and clothing.

The Hazard Assessment

A first critical step in developing a comprehensive safety and health program is to identify physical and health hazards in the workplace. This process is known as a "hazard assessment." Potential hazards may be physical or health-related and a comprehensive hazard assessment should identify hazards in both categories. Examples of physical hazards include moving objects, fluctuating temperatures, high intensity lighting, rolling or pinching objects, electrical connections and sharp edges. Examples of health hazards include overexposure to harmful dusts, chemicals or radiation.

The hazard assessment should begin with a walk-through survey of the facility to develop a list of potential hazards in the following basic hazard categories:

- Impact,
- Penetration,
- Compression (roll-over),
- Chemical(toxic gasses, noxious fumes and corrosive liquids)
- Physical hazard such as noise, electricity, heat and cold
- Harmful dust,
- Radiation hazard radio actives materials
- Biologic(infected materials and bacteria and viruses from air conditioning systems)

1.2.1 Hazard management

Employers must identify hazards in the place of work (previously existing, new and potential and regularly review them to determine whether they are significant hazards and require further action. Where there occurs any accident or harm in respect of which an employer is required to record particulars, the Act, requires the employer to take all practicable steps to ensure that the occurrence is so investigated as to determine whether 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; or
- Harm (being more than trivial) the severity of whose effects on any person depends (entirely or among other things) on the extent or frequency of the person’s Exposure to the hazard; or

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- Harm that does not usually occur, or usually is not easily detectable, until significant time after exposure to the hazard.

Information for employees

Before an employee begins work, their employer must inform them of:

- Emergency procedures;
- Hazards the employee may be exposed while at work;
- Hazards the employee may create while at work which could harm other people;
- How to minimize the likelihood of these hazards becoming a source of harm to others; and the location of safety equipment. The employer is 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.

2.2.1 Occupational Health and Safety

Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturer specifications and enterprise work procedures. The potential for accidents in tree work is very high, and many of the injuries are serious. So safety in your work is of the utmost importance to you, your family and your fellow workers.

Safety checks: injuries have been reduced by the use of good safety rules in professions and industries the world over. Adopt a safe conduct attitude:

- Work with due consideration for your own and others' safety at all times.
- Carry out instructions properly.
- Ask when you are in doubt.
- Rectify and report all unsafe conditions.
- Report unsafe machinery and equipment.
- Use correct tools and equipment.
- Keep the workplace as tidy and organized 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 authorized and until guards are in place and people aware.
- Wear and use the protective clothing and equipment provided.
- Obey all safety rules and signs.

Personal protective equipment (PPE) in arboriculture work

Personal protective equipment as outlined below shall be required where there is reasonable probability of injury that can be prevented by such equipment and where required by existing occupational health and safety regulations.

Head protection - industrial Protective Head ware.

Eye protection -shall be worn when operating chainsaws, chippers, brush saws or circular saws or wherever there is a danger of foreign objects or particles striking or entering the eye.

Hearing protection -Wear CSA Class A or Class B hearing protection when noise level is above 85 decibels" A" weighted or above. As a rule chainsaws and chippers exceed 85 decibels.

Leg protection -adequate chainsaw cut resistant leg protection (BNQ or UL/cUL approved) shall be worn when operating chainsaws.

Foot protection - wear boots with CSA Class "1" toe caps, and minimum of 15 cm high uppers.

Fall protection equipment -Where a worker is using an aerial lift and is exposed to the hazard of a fall that is 3 m or more above the nearest safe surface the worker, as soon as entering the bucket, shall use a means of fall protection as outlined in the Fall Protection and Scaffolding Regulations

1.3. Select tools, equipment and machinery for arboriculture use

Tools ,equipment and machinery might be used in arboriculture include: ropes, safety lines, safety harness, saddle, lanyard, karabiners, Marking gauges, Levelling equipment's, tape measures, rope grabs, pole belts and other climbing gears, chipper; small chain saw and appropriate maintenance equipment: ladder, hand saws secateurs, elevating plat form(EWP) and vehicle for loading and removing pruning and their pictures listed below.

Ropes:

1. Climbing Rope

- Climbing ropes shall be used when working aloft in trees.

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- When crotched into the tree the arborist climbing line shall be secured to the climbers saddle using an approved connector and tied in with an approved climbing hitch, rope grab or other ascending or descending devices.
- Climbing ropes should be a different color than working ropes, and must not have a metallic core.
- Climbing ropes shall be identified by the manufacturer as suitable for tree climbing.
- Climbing ropes shall only be spliced by the manufacture or an approved supplier.
- Climbing ropes shall be inspected daily and discarded if worn.

2. Working Rope

- Ropes used in proximity to electrical lines or equipment shall not have a metallic core and shall be kept clean and dry.
- Ropes shall be capable of supporting the weight of the limb being worked.

3. Shock Loading Ropes

- Arborists shall strive to minimize the shock loading ropes at all times, and maintain a 10 to 1 safety factor when choosing ropes for a particular operation.



Safety harness



Saddle



Lanyards



Karabiners



Rope grabs



Pole belts



Chipper



Small chain saw



Secateurs



Elevating plat form (EWP)



Traffic control



Ladders



Axe

Fig: 1.1 Climbing and Pruning operation tools and Equipment

In general the above listed equipment have different use so, Workers should also be trained and competent in the follow areas as they apply to their work:

- Safe use and maintenance of chainsaws
- Safe use and maintenance of pruning tools and winching equipment
- Tree Climbing, Pruning, dismantling and felling techniques
- Use inspection and maintenance and storage of personal protective equipment
- Emergency procedures for Tree an EWP aerial rescue
- Rigging and rigging equipment
- Use and application of agrichemicals
- 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

1.4. Carryout pre-operational and safety checks

Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturer specifications and enterprise work procedures. The potential for accidents in tree work is very high, and many of the injuries are serious. So safety in your work is of the utmost importance to you, your family and your fellow workers

- Every employer 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. A competent person shall be nominated to take charge if it is necessary for this person to leave the operation.
- Every employer shall exercise such supervisions will ensure that work is performed in a safe manner at all times. 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.
- All workers shall acquaint themselves with the relevant safety provisions of this code for each operation, and shall take all necessary precautions to ensure their own safety and the safety of others engaged in each particular operation.
- No person shall work in or visit an arboriculture operation while under the influence of drugs or alcohol.
- 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 all such operations while such 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, proper inspections of the work area shall be carried out to identify hazards to the worker. These may be decay or rot, dead branches, suspended materials such as branches, interlocking branches or power lines, either within or close to the crown. All workers shall be given clear

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

- Unless training on a one-to-one basis or directly assisting in the operation, only one person shall normally be up a tree at one time. Generally at least two persons shall be employed at any time on tree work. However, specialists with competent experience who are properly equipped with the appropriate working and safety equipment, may work on their own on general tree work. Where any doubt exists as to their safety or wellbeing because of the nature of the work, or any hazard to the public, a further person shall be present.
- No person shall be required to work on their own with a chainsaw unless:
 - (a) Visual or voice contact is maintained with other person who is able to assist or obtain help in an emergency
 - (b) They have an audible alarm device that can be activated in an emergency.
- While working on their own in other circumstances, a worker's presence and welfare shall be ascertained at least once in any work period in which that person is so engaged and at the completion of each work period. As a guideline, this time should not exceed 2 hours.
- All persons approaching an operational area shall;
 - (a) Before entering the area, notify the employer or person in charge.
 - (b) While machinery is operating, approach the area, where practicable, From above or Level with the operation.
 - (c) Draw attention to their presence and intention by calling out loudly Or some other means
 - (d) Not enter the operational area until acknowledged or signaled to do so.
- No person under the age of 15 shall work in any arboriculture operation. Work carried out by young people 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.
- No person under the age of 15 years shall, without the permission of the person in charge and unless under constant supervision of responsible person, be permitted

in the vicinity of arboricultural operations. All vehicles used in conjunction with an arboriculture operation shall have a current Warrant of Fitness.

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

Machinery

- No machine shall be used unless it is:
 - (a) Properly maintained in a sound and safe condition and inspected at least daily;
 - (b) Suitable for the operation in capacity and design;
 - (c) Operated by a competent person (or person training under adequate supervision);
 - (d) Where appropriate, equipped with brakes that are capable of holding the machine
On any gradient on which it is operated;
 - (e) Serviced and operated within the manufacturer's recommendations and specifications. Unless training under adequate supervision, operators shall only use machinery and equipment they are trained and authorized to use.
- Any person who discovers any defect in any machinery shall forthwith 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 and no person shall get under an unblocked, raised blade or accessory for any Purpose.
- Where machines are operating adjacent to or on roads or road verges, appropriate road signs shall be used to warn other road users, and machines shall comply with Transport Regulations.
- In arboriculture operations, owners of machinery used shall take all practicable steps to remove, at source, excessive noise levels that are likely to impair a worker's hearing.

1.5. Selecting, checking, using and maintaining suitable safety equipment and PPE

All machinery used in an arboricultural operation shall comply with the Health and Safety in Employment, the Hazardous Equipment Regulations, and the Transport

Protective clothing and equipment

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

- Protective equipment suitable for the work being performed shall be provided, as required, for the use of all workers.
- 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 discarded.

- Clothing of high-visibility colors should be worn so that workers or other persons entering operation areas are more readily seen by others.

LEG PROTECTION

- All workers required to use a chainsaw shall wear safety leg protection. When leg wear to Specification for protective leg wear for chainsaw users becomes available, all replacement leg wear shall comply with that standard or its equivalent

SAFETY FOOTWEAR

- All workers engaged in arboriculture operations shall wear footwear which gives support to the ankles. Such footwear shall have steel toecaps and comply with Specification for safety footwear. Lace up types shall be securely laced up at all times.

Steel Toe Gumboots: Waterproof safety footwear including general purpose, steel midsole, white gum boots and gum boots for working with chemicals.



Safty shose



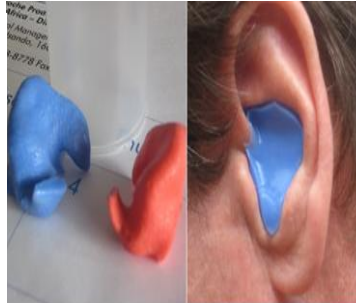
Helemet



Glave



Eye Goggle



ear protection

Fig: 1.2 persenal protective equipment

Elastic Sided Safety Boot: Most safety boots use soles that offer up to 130 degrees c heat resistance, for welders and high temperature environments the boots in this section boots can offer more

SAFETY HELMETS

- Safety helmets shall be worn at all times by all persons using a chainsaw and by those on the ground, in or about an arboricultural operation. Machine operators who are fully protected by an approved canopy need not wear helmets. However, should the operator cease to be fully protected by the canopy, then a safety helmet shall be worn?
- All safety helmets shall comply with the requirements of Specification for industrial safety helmets (medium protection) or better.
- Safety helmets for chainsaw operators shall be fitted with earmuffs and have provision for visors.
- Safety helmets should be of high-visibility colors.
- Helmets should be inspected regularly. They shall be replaced if they have suffered damage. Otherwise, high-visibility colored helmets shall be replaced as recommended by the manufacturer. Other helmets shall be replaced no more than three years after issue to the wearer.

- Helmet harnesses should be inspected regularly to check the clearance distance is correct, be washed as required, and be replaced on a yearly basis.
- 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.

HEARING PROTECTION

- All workers shall wear hearing protection in any area subject to harmful noise (see Appendix for noise levels and grades of hearing protection). All chainsaw operators shall wear at least grade 4 earmuffs.
- To alleviate harmful noise:
 - (a) People should not approach or remain in high noise areas unnecessarily or without Adequate hearing protection.
 - (b) Noisy machines and equipment should be operated at a distance from tree work. If This is not possible, the machine or operator should be enclosed to cut down noise levels.
 - (c) Silencers should be fitted to exhausts and be regularly inspected and maintained.
 - (d) Earmuffs should be regularly inspected and maintained to the highest standard. Any worn or damaged parts shall be replaced where necessary.

EYE PROTECTION

- Visors or goggles for eye protection should be worn where excessive dust or danger from flying debris exists.
- Eye protection is to be made available to worker on request.
- Eye protection equipment shall be maintained to the highest standard. Damaged equipment shall be repaired or discarded.

Hand tools

- All tools used shall be kept in good working condition, be properly sharpened where applicable, and shall be restricted to the use for which they are intended.
- Handles shall be securely and correctly attached to tools. All wooden handles shall be of firm straight-grained stock and free from defects. Do not use tools with loose handles. Check wooden handles for cracks or splits. Damaged handles shall be replaced.

- Split axe heads, damaged or mushroomed steel wedges, hammers and similar equipment shall be properly repaired or replaced.
- A maul or other suitable tool shall be provided for the driving of wedges.
- Pole pruners should be provided with guar preferably of leather, to cover the cutting heads when the pruners are not in use.
- Jackdaws shall have a guard or pouch equipped with a strap, rope or snap so they can be secured to the worker's belt during work or while changing positions.
- Saws, pruners and other tools should not be carried in the worker's hands while climbing. They should be raised and lowered by tool lines or clipped on to the climbing harness. Canvas buckets are ideal for small tools.
- Tool lines should be attached to the end of the tool so that there is less chance of the tool being caught in obstructions when raising or lowering.
- Do not drop or throw tools to the ground in general operations. If it is necessary to drop or throw tools to the ground, a warning shall be given and the ground area cleared.
- All tools shall be removed from a tree when the worker has finished the task or when a crew is finished for the day

First aid

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

- (a) Where operations involve a number of people, first aid treatment for the injured shall be in the hands of a person who by training or experience is the most qualified to do so. A holder of a current qualification from St Johns, Red Cross or other organization approved by OSH should be present at each operation.
- (b) A first aid kit or box shall be kept in each Keep a vehicle and at each work area. Vehicle kits or boxes can substitute for those required at each work area, provided vehicle remains at the work site.
- (c) Every box or kit shall be kept fully stocked to the minimum requirements detailed and shall be stored soaps to ensure that the contents are protected against contamination by dust, heat, moisture or any other source.

MOBILE FIRST AID KIT FOR UP TO 10 PEOPLE

1. Individually wrapped triangular---bandages 2

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2. Individually wrapped roller- bandages 2
3. Individually wrapped sterile dressings-(non-adhesive)
4. Individually wrapped sterile eye pads-with attachment
5. Individually wrapped sterile adhesive dressings
6. Individually wrapped sterile wound dressings (non-medicated)
7. Safety pins
8. Disposable gloves
9. Card listing local emergency numbers
10. List of minimum contents of kit
11. Basic first aid notes (e.g. St John, Red Cross)
12. Hepatitis B/Aids notice on first aid box
13. Resusci-aid mask
14. If tap water is not available, sterile water or sterile normal saline in disposable containers, each holding at least 300mls, shall be kept near the first aid box.

Lifting and handling

- Check the load to ensure it is within lifting capacity and can safely be handled without causing injury from strain, sharp edges, splinters or other conditions.
- Ensure the work area is clear of obstructions if the load is to be carried from one place to another.
- Stand close to the load with the feet apart, one foot behind and the other beside the load.
- Bend knees, grasp the load and lift by straightening the legs.
- Avoid reaching, bending forward to lift, twisting the back or bending sideways.
- Be able to see over or around the load before moving. Face the spot where the load is to be placed, bend the knees to lower the load, keeping the back as straight as possible and the load close to the body. Protect fingers from pinching before release of load.
- Do not try and lift or move objects beyond your capacity—ask for help. Co-ordinate lifting, moving and lowering by pre-arranged signals.

Overhead power lines

- The Electricity and Regulations and the Electrical Code of Practice require that persons working with hand tools or ladders, and owners or operators of any machine

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working in proximity to live power lines, shall keep the tools or ladders or any part of the machine at least 4 meters away until advice has been received from the owner of the supply line as to the safe working distance from that particular line.

- All machinery likely to be used at any time in the proximity of overhead power lines shall display, in a prominent place, an approved warning notice regarding working near overhead power lines.
- Before working in the vicinity of power lines, inspect the tree to be climbed or worked to determine if there are wires passing through the tree or in proximity to it. If there is any doubt about safe working distances, obtain advice from the local power authority. The power lines may have to be reenergized before work commences.
- When working in the vicinity of power lines, particular care must be taken with metal ladders, pruners and hand tools. Do not approach within 4 meters of any live power line until voltages have been confirmed by the supply line owner.
- Take particular care with trees or branches that may fall on to live power lines. If necessary, use ropes to ensure that parts of the tree being removed fall away from power lines and, as necessary, follow the instructions as outlined in

Underground services

If work involves excavation or stump disposal, the appropriate authority is to be contacted as to the exact location of any water main, storm water or sewerage pipes, telecommunication or power cables or gas lines. When free-dropping blocks from sectional felling, the location of these services should also be known. Sound practical advice is given in the OSH publication A Guide to Safety with Underground Services.

WORK NEAR PUBLIC ROADS

- Trees within two tree lengths of road and rail traffic shall not be felled unless suitable precautions have been taken to warn oncoming traffic. Such precautions shall include the posting of warning signs and, where necessary, the placement of staff with flags at appropriate safe positions. Section felling may be necessary in some circumstances. (!) In these cases, a suitable safety area shall be demarcated. This may be less than two tree lengths from the work area.

- The only acceptable sign is the “Other Hazard”(!) sign with the relevant plate “Tree Work “complying with the requirements of the Transit New Zealand handbook Working on the Road, handbook for temporary traffic control and safety.
- Where work necessitates the closing or partial closing of a road, the above precautions are to be taken and compliance is required with any additional conditions laid down by the local road controlling authority.

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Self-check 1	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Instruction I: choose the correct answer from give Alternative. You have given 1 Minute for each question. Each question carries 2 Point.

- is the cultivation, management, and study of individual trees, shrubs, vines, and other perennial woody plants.
A. Arboriculture B. Thinning C. Pruning D. All of the above
- Which rope type is used when working aloft in trees?
A. Working Rope B. Climbing Rope C. Shock Loading Ropes D. All of the above
- Which one is work undertaken by an arboriculture supervisor?
A. Planning the removal of trees B. developing a tree pruning program C. A&B D. None of the Above

Instruction II: Essay

- Write tools, equipment and machine used for Arboriculture operation 6 Point

Note: Satisfactory rating 12 points Unsatisfactory - below 12 points

You can ask you teacher for the copy of the correct answers.

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Operation Sheet -1

1.1 Techniques of safe ground support operations in arboriculture.

A. Tools and equipment's

- I. Personal protective equipment's listed above.
- II. Leveling equipment's (water level, string lines, ranging poles, rakes, digging tools)
- III. warning signs
- IV. tape measures
- V. Marking gauges
- VI. Axe, pruning tools, foot wear, gloves, rakes, traffic control spades, shovels)
- VII. Chain saw (machine)

B. Procedures/Steps/

Put on your personal protective clothes in accordance with the approved requirement

General procedures that should be followed by the workers:

Step-1: Select the work unit site

Step-2: Identify the trees of arboricultural practices needy

Step-3: Identify tools and equipment's required for the accomplishment of the activity to be done.

Step-4: prepare climbing tools and its accesses perfectly and checking.

Step-5: Climbing

Step-6: Maintain clean work site during operation

Step-7: Start operation

Step-8: Continue communication and observing the above one with ground person on facilitating send and receive processes of required materials

Step-9: Descend down and finish work.

Step-10: Prepare a report

LAP TEST-1	Performance Test
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools, materials and Equipment you are required to perform the following tasks within 3 hour. The project is expected from each student to do it

Task-1 Demonstrate safe ground operation

LG #30

LO #2- Maintain a clear work site during Operations

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Keeping away persons not involved in the work program
- Placing rescue equipment
- Keeping drop zone free of debris

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Keep away persons not involved in the work program
- Placed rescue equipment
- Keep drop zone free of debris.

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks
- Perform Operation Sheets
- Do the “LAP test”

Information Sheet 2

2.1. Keep Persons not involved in the work program

Workplace Safety Tips - Top Ten List

Top Ten Workplace Safety Tips:

1. Maintain a clean work area. Not only will you remove many hazards from a work area by keeping it clean, but you will also provide a more productive work environment for your employees.
2. Use guards and engineering solutions wherever possible instead of relying on PPE - personal protective equipment. PPE is hard to police and uncomfortable to wear. Find a way to prevent the exposure in the first place. Your workers will be much more productive if they are comfortable
3. Assume your employees want to work safely and give them that chance. Many safety incentive programs seemed to be based on the idea that employees want to get hurt and you have to bribe them not to stick their hand in the machine. If you have that idea, then these tips are not for you.
4. Give clear work instructions. Make sure your employees know the right way to do what you expect of them. Don't just give them a list of things not to do. Include safety instructions in every procedure you write.
5. Don't dwell on worst case scenarios but focus on what is most likely to occur. Start by focusing your energy in preventing your most common incidents. That means you will have to keep an accurate OSHA incident log even if it looks bad to some manager you report to.
6. Love your employees. Don't confuse this with something that might get you a sexual harassment claim. I mean, care about your employees and let them know you do. If a machine is becoming unsafe, shut it down before someone gets hurt.
7. Spend time getting to know the work your employees do. Even if you once did that job, it is likely it is done differently by different people. Look at what people are actually doing and compare this to what is written in procedures. If the procedures are different from the actual practice, find out why.

8. Maintain the machinery in good working order. Many times employees get into dangerous situations by having to compensate for a machine defect or wear. In the case of wear, it may have occurred so gradually that they think it is normal. A strong preventive maintenance program makes for a strong safety program.
9. Avoid unnecessary hazards. Look for new materials or equipment that can eliminate the hazards your workers are exposed to.
10. Maintain a clean work area. See workplace safety tip number one above. Potential exposures to hazardous material and conditions can be dramatically reduced simply by keeping the work area clean. And the benefit in employee productivity and morale is worth the effort even without the safety incentive.

Employer's duties

Employers have the most duties to perform to ensure the health and safety of employees. If you are an employer. Then you have a general duty to take all practicable steps to ensure the safety of employees while at work. In particular, you 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 in the place of work is designed, made, setup and maintained to be safe for employees;
- Ensure that employees are not exposed to hazards in the course of their work
- Develop procedures for dealing with emergencies that may arise while employees are at work.
- Where the public have access to any operation, a sufficient area shall be designated as the work area and be marked prior to starting work by the erection of warning signs or barricading or roping off.
- Branches and debris should be thrown or lowered, where applicable, away from any street and footpath if possible.
- Tools, equipment and machinery are stored clear of debris and drop zone.
- working with hand tools or ladders, and owners or operators of any machine working in proximity to live power lines, shall keep the tools or ladders or any part of the machine at least 4 meters away until advice has been received from the owner of the supply line as to the safe working distance from that particular line.

- Rescue equipment is placed within easy access.
- Handles shall be securely and correctly attached to tools. All wooden handles shall be of firm straight-grained stock and free from defects. Do not use tools with loose handles. Check wooden handles for cracks or splits. Damaged handles shall be replaced.
- Split axe heads, damaged or mushroomed steel wedges, hammers and similar equipment shall be properly repaired or replaced.
- Saws, pruners and other tools should not be carried in the worker's hands while climbing. They should be raised and lowered by tool lines or clipped on to the climbing harness. Canvas buckets are ideal for small tools.
- Do not drop or throw tools to the ground in general operations. If it is necessary to drop or throw tools to the ground, a warning shall be given and the ground area cleared.

2.2. Placing Rescue equipment

Rescue equipment include first aid kit, emergence contact numbers, harness, life lines ,prussic loop, karabiners, climbing spurs, flip line/pole strap, pulleys and tape

- Rescue equipment is placed within easy access
- A rescue process in place, supported by the necessary equipment, and ensure that workers are trained in the procedure and practice tree rescue regularly.
- Each tree crew must be aware of the possibility of accidents
- There should be at least one other person on site who is capable of climbing to be able to retrieve an injured climber.
- All crew members must be familiar with emergency procedures.

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

- Rescue and first aid training must form an integral part of an induction program for all workers. Workers must know these procedures from day one.
- All workers involved in arboricultural operations shall hold a current first aid certificate.
- A complete rescue climbing kit must be available to the ground workers in the event that a climber becomes injured or entangled in a tree and requires assistance. The kit must include:

✓ Climbing harness and carabineers

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- ✓ Pole belt
- ✓ Climbing spikes
- ✓ Pressure bandage for blood loss
- ✓ Pocket knife with lanyard
- 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.

Safety harnesses

All safety harnesses shall comply with or be equivalent to NZS 5811: 1981 or AS1891: 1983 Industrial safety belts and harnesses.

Before use, harnesses must be checked to ensure that webbing, leather stitching and rivets are in good condition and are secured, and rings and clips are serviceable and free from defects or damage. The most suitable harness for tree work combines saddle with a waist or body belt which minimizes fatigue and allows free movement. Leather harnesses should be cleaned with saddle soap and dressed with dubbing after use. Webbing belts can be cleaned by washing in mild detergent, rinsing and hanging to dry. Safety harnesses should be kept in compartments or suitable containers while being transported to avoid harmful substances or damage. Safety harnesses should be stored by hanging on hooks or pegs in a dry place away from excessive heat or sunlight.

Ancillary equipment

- All Karabiners, descenders/ascenders, rings, strops and other ancillary equipment used in climbing operations shall be proof tested to a 2200kg rating and marked with this information and the safe working load.
- Always use equipment to the manufacturer's instructions.
- Karabiners'' shall be of spring-loaded screw gate or spring-loaded locking gate construction. All Karabiners' should be locked when in use. Avoid sudden jerks or loads on ancillary equipment to prevent shock loading and to prolong its life.
- Check ancillary equipment for physical damage such as significant dents or distortion, cracks or forging folds, weak pivots or springs and replace where necessary. 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 equipment by keeping it clean at all times. Carabineer locking screws and hinges should be oiled occasionally to ensure their free operation.

2.3. Keeping drop zone free of debris

Drop zone: is the area in which the tree pruning or limbs expected to fall.

- The drop zone is calculated by establishing a radius in which tree pruning are expected to fall and adding a safety margin.
- The drop zone may be marked out by signs, witches hats, and barriers.
- Sometimes it is necessary to control pedestrian traffic on sidewalks or trails, in parks or parking lots, or at intersections.
- The key is to establish a pedestrian barrier that clearly directs people away from the work area.
- Clearly mark your work area and make it difficult for pedestrians to enter.
- You can usually accomplish this using walkway signs and barrier tape.

Safe Drop zone: All persons approaching an operational area shall:

SITE SAFETY



Fig 2.1: Drop zone

Don't enter an operational area until you are signaled.

- (a) Before entering the area, notify the employer or person in charge; and
- (b) While machinery is operating, approach the area, where practicable, from above or
Level with the operation; and
- (c) Draw attention to their presence and intention by calling out loudly or some other
Means; and
- (d) Not enter the operational area until acknowledged or signaled to do so.

DROP ZONE REQUIREMENTS

- The drop zone will extend 360 degrees around the affected area;
- The drop zone shall be set at a distance beyond the drip edge (recommend 10 feet minimum) and far enough back to ensure tree parts do not fall outside the perimeters of the drop zone.
- The shape, size and distance of the perimeter from the tree(s) may not be circular and may not have equal distances across its boundaries due to geographic/site restrictions (i.e.. steep slopes, boulders, sheds, fences, garages, houses, etc.). In these cases, a particular boundary may be Deemed off limits to any encroachment by all employees during the execution of the work plan.

Drop zone perimeters will be established using any of the following methods:

- Identifying fixed objects such as trees, bushes, yard structures, large rocks, utility poles, driveways, etc.
- Safety cones, temporary marking flags, ribbon, etc.

DROP ZONE COMMUNICATION

- Verbal and visual communication protocol among workers aloft and ground personnel shall be established. Once a trimmer aloft gives a verbal warning that they are making cuts, workers below shall not enter the drop-zone until the trimmer gives a verbal and visual “all clear”.
- Workers entering the drop zone can exit and re- enter at any point until the trimmer aloft gives a command for **all ground personnel** to exit the drop zone and not re-enter.

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- The trimmer aloft shall not resume work until all ground workers have exited the drop zone and the trimmer aloft receives an “all clear” response from every ground worker.

DROP ZONE IMPLEMENTATION

the person-in-charge shall:

- Establish a plan to safely manage the worksite, including defining the drop zone perimeter(s) and communication protocol.
- Establish a drop zone for all trees requiring work and IDENTIFY the perimeter(s) to the crew.
- Identify verbal and visual communication protocol among trimmers and ground personnel. Verbal communication by voice or radio shall employ a Command and Response (C&R).

Self-check 2	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Instruction I: choose the correct answer from give Alternative. You have given 1 Minute for each question. Each question carries 2 Point.

- Is the area in which the tree pruning or limbs expected to fall.
A. Drop zone (DZ) B. Thinning C. tending D. All of the above
- Which one is including under rescue equipment?
A. First aid kit B. harness C. life lines D. karabiners E all

Instruction II: Essay

- Write drop zone requirements. (4pts)
- List down the procedures you follow to keep site safety in arboriculture operation area (drop zone). (4pts)

Note: Satisfactory rating - 12 points Unsatisfactory - below 12 points

You can ask you teacher for the copy of the correct answers.

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Operation Sheet -2

2.1 Procedures of maintain Clear work site condition

A. Materials and tools :

- Personal protective equipment's listed in LG 1 operation sheet.
- warning signs
- Hand tools described above.

B. Procedures of clear work site condition

1. Put on your personal protective clothes in accordance with the approved requirement and try to demonstrate how to maintain clear work site.
 2. Preparing the equipment's: All the equipment and tools to be used in the field listed above should be assembled and sanitized. Also, it should be checked and adjusted, if necessary.
 3. Try to understand the guidelines and demonstrate where and how to use such materials and hand tools according to the following procedures in arboriculture work, without harming yourself and the equipment.
 - All tools used shall be kept in good working condition, be properly sharpened where applicable, and shall be restricted to the use for which they are intended.
 - Handles shall be securely and correctly attached to tools. All wooden handles shall be of firm straight-grained stock and free from defects. Do not use tools with loose handles. Check wooden handles for cracks or splits. Damaged handles shall be replaced.
 - Split axe heads, damaged or mushroomed steel wedges, hammers and similar equipment shall be properly repaired or replaced.
 - A maul or other suitable tool shall be provided for the driving of wedges.
 - Pole pruners should be provided with guards, preferably of leather, to cover the cutting heads when the pruners are not in use.
 - Jack saws shall have a guard or pouch equipped with a strap, rope or snap so they can be secured to the worker's belt during work or while changing positions.
 - Saws, pruners and other tools should not be carried in the worker's hands while climbing. They should be raised and lowered by tool lines or clipped on to the climbing harness.
- Canvas buckets are ideal for small tools.

- Tool lines should be attached to the end of the tool so that there is less chance of the tool being caught in obstructions when raising or lowering.
- Do not drop or throw tools to the ground in general operations. If it is necessary to drop or throw tools to the ground, a warning shall be given and the ground area cleared.
- All tools shall be removed from a tree when the worker has finished the task or when a crew is finished for the day.

4. Collect the equipment you used and store in appropriate place.

5. Prepare a report

LAP TEST-2	Performance Test
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools, materials and Equipment you are required to perform the following tasks within 1 hour. The project is expected from each student to do it

Task-1 Perform clear work site condition.

LG #31	LO #3: Provide ground support for Tree climbers
Instruction sheet	
<p>This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:</p> <ul style="list-style-type: none"> • Maintaining communication links • Receiving and clarifying non-verbal signs of communication • Raising and lowering equipment • Performing rope handling techniques <p>This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:</p> <ul style="list-style-type: none"> • Understand communication links • Apply non-verbal signs of communication • Understand raising and lowering equipment • Performing rope handling techniques. 	
Learning Instructions:	
<ul style="list-style-type: none"> • Read the specific objectives of this Learning Guide. • Follow the instructions described below. • Read the information written in the information Sheets • Accomplish the Self-checks • Perform Operation Sheets • Do the “LAP test” 	

Information Sheet 3

3.1. Maintaining clearly Communication

Communication is a key element of all tree care activities, not only for the safety of those aloft and on the ground, but also for the efficient accomplishment of the task at hand. Throw a large motorized piece of equipment that towers over the work site into the mix, and communication becomes even more important. The frustrating experience of attempting to communicate effectively between the canopy and the ground is one that all tree crews are familiar with, adding the engine noise of the crane, a crane operator who may not be able to see the climber (and vice versa) and typically greater work heights all are factors that make communication during crane operations even more challenging.

There are a large number of communication systems available, ranging from simple hand/arm signals, such as, to voice-activated throat mikes and muff radio systems that can be fitted on existing helmets or hard hats. Regardless of which system is chosen, it is vital that all work participants know and understand the various signals or systems prior to the job beginning.

- Effective communication shall be maintained with the climber.
- Noisy machines which effect communication must be either shut down or moved away.
- Generally at least two persons should be employed when climbing is being carried out, one as the climber, the other as the grounds person.
- Working techniques and work progression shall be fully discussed and understood by ground staff before climbing commences. Rescue procedures shall be outlined and understood.
- The climber shall be securely attached to a suitable anchor point at all times by means of climbing rope, sling or safety line. The anchor lines should be kept taut at all times and secured around the main stem or branch.
- Clear communications between climber and ground staff must be maintained to ensure an understanding of what is happening or what is required at any given time.
- The climber must ensure a safe working position is adopted prior to any cuts being made in lopping and pollarding and shall clearly comply with ground staff.

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- draw attention as you enter arboriculture work area and intention by calling out loudly or some other means; and
- Don't enter arboriculture operational area until acknowledged or signaled to do so.

Improving communication in the workplace

- **Set a shared vision:** All teams need to have a clearly defined goal, objective or vision defined by their managers. The goal should be communicated to all team members and referred back to over the duration of projects to ensure the team are all working towards the same objective. These objectives may relate back to the company's own innovation strategy or specific products lines so are crucial to the overall success of the company's output.
- **Align team expectations to goals:** Discussions need to be had with team members as a group or individually to align expectations with regard to what needs to be done on the project, how it will be done, by whom and by when. These discussions help reduce the chances of wrong assumptions being established, especially early on. Discussions should be performed as part of your project change management procedure to make sure everyone has a clear understanding of what tasks and activities are expected of them when changes to plans occur.
- **Communicate clearly, regularly and equally:** These are fundamental communication skills in the workplace no matter what communication channel is used. All messages need to be clear in order to ensure there is no ambiguity or lack of understanding. Regular communications (by phone, e-mail, reports, etc.) ensures that constant progress updates are maintained and that issues/risks are rapidly being raised. Effective communication in the workplace is made more difficult with remote teams as global team members will gain more information. For remote team members to feel that they are a strong part of the team, they should be communicated with as equally as local team members. Be sensitive to understanding what is communication in workplace environments like when team members are not in the same office.
- **Use synchronous/asynchronous mediums appropriately:** Synchronous communication methods (e.g. telephone, video conferences/audio conferences, and real-time chat) provide rapid feedback and two-way discussions that are ideal for reducing ambiguity, debating subjects and establishing assumptions and goals. Asynchronous

communications (e.g. e-mail, voice-mail or collaborative team rooms) are ideal for informative messages such as updates, reports, etc. but not ideal when time is pressing since you may not receive a response straightaway. You really need to become aware of what communication techniques are important and applicable for the type of message you're sending (e.g. e-mails are not suited to debates on issues – this requires a phone call or IM chat).

3.2. Receiving and clarifying non-verbal signs of communication

- Communication is the process of transmitting information among two or more people.
- Communication effective only when both the sender and receiver mutual agreed up on the meaning of the messages.
- It is very important for communication links between the climber and ground staff to be clear and effective. These links can include verbal and non-verbal signals, two-way radios, whistles, etc.

There are two types of communication links

A. Verbal communication

A type of communication made of direct face to face or through telephone between the climber and ground staff.

B. Non-verbal communication

- Non-verbal communication is means of communication without words between the climber and ground staff.
- It includes messages transmitted by vocal means that do not involve language- the hand signals, laughs, whistles, and other assorted noises.
- When undertaking climbing work it is essential that communication be maintained:
 - ✓ Climbers and ground crew should stay in constant communication via both sight and sound.
 - ✓ Ground crew must maintain an exclusion zone throughout the works.
 - ✓ Climbers and ground crew must monitor any exclusion zones.
 - ✓ All work should stop if other people (or animals) enter the work area.

3.3. Raising and lowering equipment

3.3.1 Karabiner loading

- Ensure karabiners are loaded correctly. It is essential that they are kept in correct alignment. Secure climbing line and friction cord to the karabiner so that it is unlikely to misalign or come into contact with the gate mechanism. Use an appropriate rope termination and/or a rope holding accessory such as a plastic fast or rubber sleeve.
- Karabiners should not be ‘chain linked’ as this can easily lead to twisting and associated pressure on the gate.
- Inspect karabiners carefully and maintain before and after use.
- Monitor karabiners during use. The gate mechanism is susceptible to dirt buildup that can affect its function.
- Clean the mechanism using soapy water followed by flushing with compressed air after drying. Lubrication may also be necessary (see manufacturer’s recommendations).
- Check the mechanism function by opening the gate 10 mm and applying light rotational pressure to the barrel to bias the mechanism towards the karabiner nose. Carefully rest the gate onto the karabiner nose and release. The gate should return automatically to the locking position.
 - NB The gate must function correctly and reliably before use.

3.3.2 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.

Ladders made of metal or other electrically conductive material shall not be used in the vicinity of power lines.

CARE AND MAINTENANCE

- Never paint a ladder as painting can obscure defects.

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- Inspect wooden ladders regularly for loose or cracked rungs or stiles. Make sure nuts and bolts are tight, locks work correctly, extension locks work as intended and rope and other accessories are properly fixed and in good condition. Lubricate any moving parts.
- Metal ladders should be checked regularly for metal failure or corrosion. Particular attention should be given to the junction of the stiles and the rungs, interlocking joints and chains and pins. Ensure that style plugs, if fitted, are tight.
- Store ladders where they are protected from the weather, in a dry location and away from excessive heat.
- Wooden ladders stored horizontally shall be supported at both ends and in the middle to prevent sag. Never store materials on ladders.

USE OF LADDERS

- Whenever practicable, erect the ladder against the trunk rather than the branches of a tree.
- Ensure that both stiles are firm and as level as possible, both on the ground and at the top. If work is going to be carried out from the ladder or repeated climbing or long use is envisaged, it must be secured at the top.
- When using ladders on concrete or metal surfaces, make sure that non-slip feet or a stabilizing base is fitted. If the base cannot be adequately secured, a person must hold the ladder to prevent movement of the bottom or the ladder secured by a rope at the base.
- Leaning ladders must be positioned in a safe manner. As a general guide, the distance from the ladder base to vertical support should be one quarter of the working length of the ladder.
- The unsupported part of the ladder must not touch any obstructions.
- With extension ladders ensure that:
 - (a) Ladders with less than 18 rungs perpendicular have at least two rungs overlap;
 - (b) Ladders with 18 rungs or more perpendicular have at least three rungs overlap overlap.

- Always remove an extended ladder from tree either with a helper or by lowering using a rope tied to the top of the ladder and passed over a branch or through a short strop and pulley.
- Always face the ladder and use both hands to hold on during ascent and descent.
- Do not allow more than one person on ladder at any one time.
- Do not overreach when working from a ladder. Move the ladder to a new location when you must lean over 300mm to work.
- Do not use ladders as bridges or inclined planes to load or handle logs or other materials. Do not step from one ladder to another.
- Never walk a ladder (stilt fashion) while standing on a ladder.
- Never use temporary supports to increase the length of a ladder or fasten ladders together to increase their length unless expressly designed for the purpose

SECTIONAL LADDERS

- Sectional ladders should be tested for good fit before a climb is commenced and be numbered to maintain order.
- Each section of sectional ladders shall be secured around the tree by chain and a suitable catch provided to ensure tightness at all times.
- Sectional ladders shall not exceed 3 meters in length per section.

3.3.3 Using climbing irons

- When using climbing irons, the climber should be secured to the tree with a climbing rope and/or a lanyard. Climbers using a chainsaw on an upright stem to which their primary anchor is attached should use a steel core adjustable flip line positioned above their climbing line.
- Only connect the climbing line and/or adjustable lanyard/flip line to approved climbing attachment points on the harness. If attached centrally, ensure that the karabiner/s are not subjected to inappropriate loading. When using the lanyard from the side Dryings, take care to avoid the karabiner gates contacting objects and ‘rolling’ open.
- Check that the climbing line and the steel core adjustable flip line are not at risk of being cut by the chainsaw.

Peruse inspection

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- Climbers should check all equipment for excessive wear, damage or defects before use.
- Interim inspections of equipment subject to high levels of wear and tear should be recorded, and climbing equipment should be ‘thoroughly examined’ by a ‘competent person’ every six months (see ‘Further reading’ for more information).
- Withdraw defective equipment from use and destroy it, or mark it in such a way that it cannot be used by mistake.
- Keep safety equipment and protective clothing clear of cutting tools, fuel, chemicals and any other potential hazards at all times while on site, and during storage or transit to avoid damage through contamination.

Anchor points

- Assess the tree as a whole to ensure the structure is safe to climb. Climbers should be trained in how to select safe anchor points.
- The choice of anchor involves assessing its strength and suitability in relation to its intended purpose. When a climbing system has been installed from the ground, test the anchor point using the weight of at least two people. It may be necessary to use binoculars to assess high anchors in some situations.
- A main anchor in the tree must be strong enough to withstand both the lateral (i.e. sideways) force and downward loading encountered during climbing operations and in the event of a fall or pendulum swing.
- If in doubt about the strength or suitability of a branch to be used as an anchor, it may be appropriate to pass the climbing rope, adjustable lanyard, or false anchor around the main stem, above the anchor branch.
- When working in the top of the tree, it may be necessary to carry out work above the main anchor point. Supplementary anchor point(s) can be attached above the main anchor to give temporary support for work in a small area of the crown. In this situation, ensure that the supplementary anchor(s) is adequate and subjected to minimal lateral loading.

- Use supplementary anchors, unless the risk assessment identifies the need for the climber to be able to move freely, for example, where there is a risk of a cut section striking the climber.

Ascent

- When using rope advance techniques, i.e. ascending by climbing from one branch to the next while advancing fall protection systems, the climber must be securely attached to at least one suitable anchor point at all times by means of a climbing rope and/or safety stop(s) and harness.
- When changing anchor points, climbers should transfer their weight to the newly established rope system before releasing the original system. Climbers must ensure that before releasing the previous system, the new system and anchor has been thoroughly checked and tested.
- Where possible, ensure that access lines are configured so that, if required, a climber could be lowered to the ground.

Movement within the tree

- Climbers must be securely attached to the tree. The work positioning system must be kept as taut as possible. Climbers should check their position in relation to the anchor point and ensure that a climbing line is not snagged on a weak shoot or dead branch which may give way.
- Avoid the potential for a pendulum swing by the appropriate installation of redirects, supplementary anchors and the repositioning and/or sharing of anchor points.

Working with tools in the tree

- Ground staff should transfer equipment to the climber using the climbing line or a separate tool line. Equipment should be attached so it does not damage the rope.
- In many instances, tree pruning work can be safely and efficiently carried out using hand saws, eliminating chainsaw hazards, eg noise, vibration, fumes and difficulties with communication. However, as risks of cut injury can be high, particularly to the hand holding the material being cut, consider wearing protective gloves.

- Chainsaws must be checked, started, warmed up and turned off by a member of the ground staff before being passed up to the climber.
- Use chainsaws of an appropriate size and configuration for the material being cut in the tree. The chainsaw must be started and operated in the tree in an approved manner (see AFAG leaflets 301 Using petrol driven chainsaws and 308 Top handled chainsaws).
- Where the operation dictates that a larger rear handled chainsaw is required, the method of use should be carefully considered, e.g. the starting and work position, and control of the saw.
- When removing sections from the tree, climbers should check their work position in relation to the anchor point.
- Ensure that climbing lines are not snagged on a weak shoot or dead branch which may give way. Climbing lines should be kept clear from falling debris.
- Climbers and ground staff should be aware of risks from falling debris or equipment.

Descent

- Before descent, climbers must check that the climbing system is of a suitable length to complete the planned descent.
- Terminate the climbing system in such a way that it is not possible for the adjuster to run off the end of the rope, e.g. using a stopper knot or bulky stitched termination.
- Plan the route for descent to take into account the position of tools and equipment and how the rope(s), friction saver etc will be retrieved, once climbers are on the ground.
- Climbers must descend to the ground in a controlled manner to avoid the excessive buildup of heat that could damage PPE components. Ensure that anchor devices are also lowered in a controlled manner.
- Check, maintain and store all tree climbing equipment in accordance with manufacturer's instructions. Dry wet equipment thoroughly before storage, eg in a well-ventilated environment away from any direct heat source.

Responsibilities of ground staff

- Plan the job with the climber(s) before the work starts and be aware of the task(s) involved. On busy sites consider dedicating a specific member of the ground staff to each climber.
- Maintain effective communication with climbers at all times.
- Maintain concentration and watch the climbers. Anticipate their needs, passing up tools and other equipment, when required.
- Keep climbing and work ropes on the ground free of knots, kinks, tangles, branch wood and clear of machinery. Keep ropes in safe positions, eg away from obstructions, vehicles, equipment and the public.
- Ensure the precautions taken to exclude the public and traffic from the work area are maintained while work is in progress.
- Keep tools and equipment which are not in use away from the immediate work area.
- Control working ropes, but do not wrap a rope around any part of the body to gain extra grip or purchase.
- Continually assess the operation and modify the work plan and risk assessment as necessary. If at any stage you are unsure, stop the work in progress and reassess the operation.

3.4. Performing rope handling techniques

Where possible share the workload with the climber(s).

- Nylon climbing ropes shall be a minimum of 12mm diameter and comply with or be equivalent Specification for ropes made from manila, sisal, hemp or cotton.
- All climbing ropes shall be free of joining splices. Spliced eyes are to have the rope end Tucked at least four times. Rope ends shall be secured to prevent unraveling.
- Never use a climbing rope for any other purpose.
- Coil ropes with the lay of the rope to avoid kinking. Remove any kinks as they occur by working free to the end as the rope is gathered.

- Provide a suitable bag or box, or hang up climbing ropes to avoid contact with harmful substances or damage while being transported.
- When descending with, carabinerhitch or other descended, the rope should not be allowed to slip too rapidly as friction may burn and weaken the rope.
- When ropes are run through crutches, over branches or against bark, they should be moved slowly to avoid friction. Avoid tight crutches.
- The working breaking strength of a rope is determined by the knots used to fasten it. Knots must be simple, easily tied and readily untied. The same knots must be used by climber and Ground personnel to avoid confusion. Rope ends of knots should be at least 50mm long.
- Check ropes daily for damage before use. Pay particular attention to cuts or sheath damage as these can be an indicator of damage to the core. Run ropes through your hands to detect damage. Replace a climbing rope when:
 - (a) It has been damaged mechanically;
 - (b) It has held a severe fall;
 - (c) It has come into contact with petrol, diesel, grease or acids;
 - (d) It is older than five years.
- Store ropes coiled and hung in a cool and dry place away from sunlight. Provide protection to avoid contact with harmful substances.
- Wet ropes should be hung in a shady place to dry.
- Dirty ropes should be washed and cleaned in lukewarm water using a gentle detergent, rinsed well and hung to dry in a shady place



Fig 3.1: ropes

Self-check 3	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Instruction I: choose the correct answer from give Alternative. You have given 1 Minute for each question. Each question carries 2 Point.

1. ----- is a key element of all tree care activities, not only for the safety of those aloft and on the ground, but also for the efficient accomplishment of the task at hand.
A. Communication B. listening C. sending D. All of the above
2. Which one is provides voice and video calls as well as text messages and Instant messaging Facilities?
A. Skype B. radio C. life lines D. karabiners E all

Instruction II: Essay

1. Describe considerations in Safe work practices? (4 pts.)
2. List down Rope handling techniques in arboriculture. (4pts)

Note: Satisfactory rating - ----- points Unsatisfactory - below ----- points
You can ask you teacher for the copy of the correct answers.

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Operation Sheet -3

3.1 Rope handling techniques in arboriculture

A. Materials and tools :

- Personal protective equipment's listed in LG 1 operation sheet.
- Ladders
- ropes
- Hand tools described above.

B. Procedures of rope handling techniques

1. Put on your personal protective clothes in accordance with the approved requirement and try to demonstrate how to maintain clear work site.
2. Preparing the equipment's: All the equipment's and tools to be used in the field listed above should be assembled and sanitized.
3. Try to understand the guidelines and demonstrate rope handling without harming yourself.
 - While working above ground the worker shall be tied-in with an approved type of harness or arborist saddle, and arborist climbing-rope or safety-strap. An additional safety-strap or climbing-rope shall be used for additional stability and back-up fall-protection whenever possible.
 - Continuous fall-arrest or fall-protection will be used whenever workers are climbing, working or descending a tree and are greater than 3 m above the ground. The worker shall remain tied-in until work is completed and he/she has returned to the ground. If it is necessary to re-crotch while in the tree the worker shall re-tie in or use a safety strap before releasing the previous tie.
 - Climbers shall keep unnecessary slack out of safety ropes at all times when working aloft and not climb above the tie-point unless tied in with another rope or safety strap secured at or above the level of the climber.
 - Climbers who wish to access a tree from an aerial lift shall ensure that they are tied into an appropriate crotch in the tree with safety rope and taut-line-hitch or if this is not practical, a safety strap, before releasing themselves from their lanyard attachment to the boom.

4. Collect the materials you used and store in appropriate place.
5. Prepare a report

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LAP TEST-3	Performance Test
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hour. The project is expected from each student to do it

Task-1 Perform rope handling techniques

LG #32	LO #4: Receive and process tree During operations
Instruction sheet	
<p>This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:</p> <ul style="list-style-type: none"> • Using tools and equipment • Receiving and stacking tree pruning • Preparing tree pruning • Undertaking processing of tree pruning <p>This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:</p> <ul style="list-style-type: none"> • understand Use of tools and equipment • performed tree pruning • Prepare tree pruning • Undertake processing of tree pruning 	
Learning Instructions:	
<ul style="list-style-type: none"> • Read the specific objectives of this Learning Guide. • Follow the instructions described below. • Read the information written in the information Sheets • Accomplish the Self-checks • Perform Operation Sheets • Do the “LAP test” 	

Information Sheet 4

4.1. Tools and equipment's for pruning

This theoretical aspect deals with how to prepare tools and equipment's for root pruning in arboriculture. The most commonly used Tools and equipment's for pruning are

- Pruning-knife
- Secateurs

How used material?

☐ Secateurs are used to cut through plant shoots during summer or winter pruning or during plant manipulation.

☐ Different designs and strengths of secateurs are available. The different designs are designed to cut through branches and shoots of different thickness

Advice regarding tools is pretty straight-forward. Buy the best tools you can afford and keep them in good condition.

Recently, a number of new and innovative tools have come on the market that is extremely useful to a home owner.



Rope Saws

A new and safe way to cut high tree limbs - pull the ropes to prune while standing on the ground.

Pole Pruner & Lopper

A versatile pole pruner that can be attached to any standard-thread extension pole. Includes 14-inch pruning saw blade and 1-inch lopper.



Folding Pruner

A versatile, folding pruning saw that can be attached to any universal extension pole for long reach. Lightweight and robust.

Portable Buck Saws

Extremely lightweight and collapsible. Perfect for the homeowner, gardener and camper.

After each tree you prune, remember to disinfect your pruning tools in a solution of 1 part bleach to 9 parts water followed by cleaning with soapy water and then drying. Tree diseases are easily spread by infected tools. Finally, if you're not skilled in the use of tools like chain saws or if the pruning job is more than you're capable of managing, hire an expert. Safety first.

Hand shears : effective for small twigs and branches

Lopper shears: provide more leverage for branches 1 1/2 inches or less in diameter

A pruning saw: cuts large, woody limbs 6 inches or less in diameter

A chainsaw: makes quick work of limbs greater than 3 inches in diameter but shouldn't be used on Small limbs because of its shredding effect

Pole-pruners: include a saw and a lopping shear on an extendable shaft for cutting branches several feet off the ground

Mechanical pruning

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



French Gardening
Bypass Pruners



Rapid Action Anvil
Loppers



German Angled Bypass
Pruner

Fig 4.1: pruning tools

4.2. Receive and stack Tree pruning

Introduction to Tree Pruning

Pruning is one of the most important tree maintenance activities which gives a big impact on tree's health and structure. A well-pruned trees are not only able to maintain tree health, but also will provide a safe environment and enhance the aesthetic value.

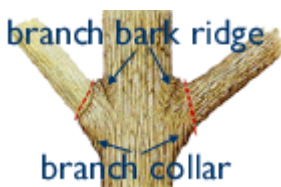


A tree may need pruning for a variety of reasons:

- To remove diseased or storm-damaged branches
- Maintain Structure in Mature Trees
- to thin the crown to permit new growth and better air circulation
- to reduce the height of a tree
- Develop Structure in Young Trees
- to remove obstructing lower branches
- to shape a tree for design purposes

Once the decision has been made to prune, your next decision is whether or not to tackle the job yourself. In the case of a large tree where you want to remove big branches in the upper area of the crown, it may be best to hire experts. Large tree pruning, in particular, can require climbing and heavy saws or even cherry-pickers and chain saws. This is a job that should be left to trained and experienced professionals. Never compromise personal safety in pruning a tree.

How to Prune

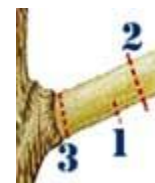


Large trees aside, there are many pruning jobs that you can do on your own. In all cases, the key is to prune the unwanted branch while protecting the stem or trunk wood of the tree. Tree branches grow from stems at nodes and pruning always takes place on the branch side of a stem-

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branch node. Branches and stems are separated by a lip of tissue called a stem collar which grows out from the stem at the base of the branch. All pruning cuts should be made on the branch side of this stem collar. This protects the stem and the other branches that might be growing from it. It also allows the tree to heal more effectively after the prune. To prevent tearing of the bark and stem wood, particularly in the case of larger branches, use the following procedure:

1. Make a small wedge shaped cut on the underside of the branch just on the branch side of the stem collar. This will break the bark at that point and prevent a tear from running along the bark and stem tissue.



2. Somewhat farther along the branch, starting at the top of the branch cut all the way through the branch leaving a stub end.

3. Finally, make a third cut parallel to and just on the branch side of the of the stem collar to reduce the length of the stub as much as possible.

A similar procedure is used in pruning one of two branches (or one large branch and a stem) joined together in a 'u' or 'v' crotch. This is known as a drop crotch cut. Make the first notch cut on the underside of the branch you're pruning well up from the crotch. For the second cut, cut completely through the branch from inside the crotch well up from the ridge of bark joining the two branches. Finally, to shorten the remaining stub, make the third cut just to one side of the branch bark ridge and roughly parallel to it.

When to Prune

The dormant season, late fall or winter, is the best time to prune although dead branches can and should be removed at any time. Pruning during the dormant period minimizes sap loss and subsequent stress to the tree. It also minimizes the risk of fungus infection or insect infestation as both fungi and insects are likely to be in dormancy at the same time as the tree. Finally, in the case of deciduous trees, pruning when the leaves are off will give you a better idea of how your pruning will affect the shape of the tree

How Much To Prune

When deciding how much to prune a tree, as little as possible is often the best rule of thumb. All prunes place stress on a tree and increase its vulnerability to disease and insects. On no account, prune more than 25% of the crown and ensure that living branches compose at least 2/3 of the height of the tree. Pruning more risks fatally damaging your tree. In some cases, storm damage, height reduction to avoid crowding utility lines or even raising the crown to meet municipal

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bylaws, your pruning choices are made for you. But even in these instances, prune as little as you can get away with.

4.3. Preparing Tree pruning

WHY SHOULD I PRUNE?

Proper pruning creates more beautiful, healthy trees and can increase the life span and productivity of fruit and shade trees. UN pruned or poorly pruned trees can often be safety hazards that endanger people and property. Low the proper pruning information provided in this publication to minimize reduction in tree health and prevent development of hazardous branches and poor branch attachment that can result in property damage personal injury.

- **Consider pruning a branch if it meets any of the following criteria:**
 - ✓ Dead, dying or severely diseased branches
 - ✓ sprouts forming at the base of the trunk
 - ✓ Branches growing toward or across the tree’s center
 - ✓ crossed limbs that rub together or may rub in the future
 - ✓ V-shaped crotches (when possible to prune)
 - ✓ Multiple leaders (upright branches that compete as secondary trunks or may develop into additional trunks)
 - ✓ Nuisance growth (interfering with power lines, sidewalks, buildings, traffic or traffic visibility, etc.)

WHEN DO I PRUNE?

You may prune deciduous trees in the dormant season once leaves have fallen in October or November, but January to March is preferred. Finish pruning in the spring, before color is evident in swelling leaf and flowerbeds. During the dormant season, much of a tree’s carbohydrates and nutrients are stored in the roots and wood, so few of the food resources needed for growth and overall health will be lost when a limb is removed. (Once leaves have formed, food reserves are then found in the leaves and are more subject to loss by pruning) Dormant season pruning also reduces the flow of sap from wounds and lessens the chance of damage by insects and disease. Pruning is both art and science.

Topiary, the art of Pruning plants to achieve unusual shapes, and bonsai are good examples of “plant art” requiring special pruning techniques. However, even these unusual platforms use the

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same basic scientific principles of pruning. This publication will provide you with the knowledge to begin pruning properly. With this knowledge, you can develop a more artistic pruning style based upon your personal preferences and experience. Orchard pruning differs from landscape tree pruning. The purpose of pruning in an orchard is to maximize economic return and stimulate early fruit production. Landscape tree pruning is usually intended to maintain tree's natural form, health and longevity and to minimize hazards that develop from improper pruning and unrestricted branch growth. Pruning to reduce a tree's size is sometimes necessary but often indicates that the wrong tree was selected for the specific landscape site. If size-reduction pruning is needed in landscape trees

Preparing your tools

Before pruning your tree you should sterilize the pruner in a solution of 10 % bleach. You can mix up a solution using 1 part bleach and 9 parts water. Prune the tree in winter when it is dormant for a faster recovery and lower changes of disease

4.4. Undertaking Processing of tree pruning

Proper pruning

Evergreen trees should be pruned late in the dormant season, shortly before new growth begins. Light pruning may be employed to collect greens for the holidays, but do not heavily prune at this time.

Summer pruning is often recommended for spring flowering trees, which carry preformed flower buds through the winter. This reduces the loss of flowers cut while still in the bud. Summer pruning is appropriate for other trees, but limit summer pruning to removal of deadwood and new branches that have not exceeded the thickness of your thumb. Pruning young trees is preferable to corrective pruning of large trees. Pruning a young tree removes smaller branches removing less food reserves from the tree and creates smaller wounds that close more quickly

Fruit Tree Pruning Instructions

Pruning fruit trees is one of the most critical and most misunderstood parts of caring for a fruit tree.

Incorrect pruning can cause the limbs of a fruit tree to break as well as creating a poor crop of fruit. Fortunately, fruit tree pruning is a process that can be under taken on a large scale once when the tree is young .after that points the tree can be maintained with a little pruning effort each year.

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Open center pruning

Plants a new peach .plum or nectarine trees so that the graft union on the trunk is approximately 3 inches above the soil. Then cut back the central leader so that it is 30 to 34 inches above the soil. There should be several new buds that are 6 to 9 inches below the cut .these buds will develop on to new branches. Once these branches are 3 to 4 inches long, cut away all but the 5 strongest .these 5 strongest branches will become the trees scaffold limbs. These limbs should be evenly spaced and branches away from the trunk with strong angles. During summer, these branches should be spread apart at a 45 to 60 degree angle with a tooth pick or clothespin to train them to grow correctly.

General pruning

In addition to training trees grower should prune them to keep them healthy .water spout and suckers which are small limbs that grow upright and do not produce fruit should be removed. Water spout grow from a tree limbs while suckers grow from the trunk .growers should also remove dead, disease, and broken limbs as well as limbs that grow inward toward the center of the tree's canopy or cross and rub other limbs

Street Tree pruning

Maintenance work performed on trees aims to manage tree health and enhance the quality of the treed landscape across the city, as well as reducing the inherent risks associated with trees in an urban area, and complying with legislation.

- Maintenance work on publicly managed trees will occur to:
 - ✓ Reduce the risk to public safety.
 - ✓ Decrease potential damage to property.
 - ✓ Provide clearances for pedestrians, vehicles and sight lines.
 - ✓ Provide clearances around services and utility lines.
 - ✓ Manage tree health.
 - ✓ To shape young trees.
 - ✓ Respond to tree or branch failure resulting from severe storms or other damaging activity
- Pruning work will be done with regard for the species, age, form, size, condition and position of each tree, with the aim of maintaining the long term health of the tree.

Pruning Forest Trees

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The most common reasons for pruning trees in plantations or woodlands are to maintain a single central leader, repair storm damage, or promote clear trunks or boles for eventual production of high-grade lumber or veneer logs. Conifers planted for windbreaks are pruned to correct multiple leaders or damage by wind or snow. Ornamental and shade trees may be pruned to improve appearance or modify shape. Christmas trees are sheared to produce full, symmetrical crowns with dense foliage and desired taper. Forest trees may be pruned at any time of the year, but the preferred time to remove live branches is during the dormant season (late fall or early winter). Avoid pruning oak trees between March 1 and July 1 to reduce the risk of infection by the oak wilt fungus. To avoid excessive bleeding from pruning wounds, do not prune maples

During spring. Young, small trees should not be pruned except to correct multiple leaders. Maintain one central leader on forest trees to promote straight, strong trees. Once a single central stem is developed, do not prune the top of the tree. Trees such as walnut may require considerable training to maintain a single leader. Always maintain at least two-thirds of the total tree height in living branches. Excessive removal of live side branches will reduce leaf area and retard growth rate. As the tree increases in height, lower side branches may be removed gradually over a fairly long period of time. In high quality forest trees grown primarily for lumber or veneer log production, a clear bole length of 17 feet is a desirable target. Pruning large side branches on existing trees is not recommended. Branches more than three inches in diameter will generally not heal over fast enough to generate clear logs by harvest time. Excessive removal of large branches will only reduce leaf area and slow diameter growth on the merchantable trunk. Prune only high-value species with straight trunks. Select the 50 or 100 best "Crop trees" per acre in your woodland or plantation, and concentrate pruning and other cultural activities on those trees. Based on potential economic return from pruning, only high quality Walnut trees deserve pruning at the present time. Red and white oak trees may be good candidates for pruning, but the estimated dollar return from this activity is somewhat doubtful under current market conditions. When a live branch is removed by pruning, a wound is created on the trunk.

- The following recommended tips will minimize the damage and promote fast healing:
 - ✓ Do not leave branch stubs. These protrusions will have to decay and fall off or the diameter of the trunk will have to increase sufficiently to cover the stub.
 - ✓ Do not use flush cuts (figure 1). Cutting too close to the main trunk excessively wounds the tree and removes the natural mechanism that promotes healing.

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- ✓ Do not cut in back of the “branch-bark ridge” (figure 2). Every branch has at hick bark ridge separating it from the main stem. Always cut as close as possible to the outer edge of the branch bark ridge, but do not cut into or behind the ridge.
- ✓ Do not tear the bark below the cut when pruning larger branches. Remove the major portion of the weight using a two-cut procedure, and then remove the stub (figure 3). Bark under the branch can tear, if the branch weight is not removed before the final cut.
- ✓ Do not use wound dressings to cover pruning cuts? Wound dressings will not help and may even hinder the healing process.

The “branch-bark ridge” and proper placement of cut.

Pruning dead branches also requires care to minimize possibility of injury and to promote fast healing. Do not cut into the callus ring that forms around the base of dead branches. Cut as close as possible to the callus ring, but do not wound the callus material. Damaging the callus ring will slow the healing process and promote internal decay.

Proper pruning

1. under cut
2. Upper cut to remove branch
3. Final cut

Improper pruning

1. Stub too long—improper cut
2. Split below stub—injury to stem

4.5 maintaining Surrounding environment

Before climbing the tree the worker shall ensure the following surrounding environment condition:

- (a) Visually assess the structural stability of the tree;
- (b) Select and inspect the safest path of ascent;
- (c) Select an appropriate crotch for crotching-in;
- (d) Identify the location of any electrical conductors and plan a path to maintain adequate clearance;
- (e) Identify any other electrical hazards such as branches contacting electrical conductors;
- (6) Identify or locate any dead, lodged or hanging limbs that may become dislodged and also check for wasp/bee/hornet nests or rodents that may be in the tree;

Self-check 4	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Instruction I: choose the correct answer from give Alternative. You have given 1 Minute for each question. Each question carries 3 Point.

- Is the most common reasons for pruning trees in plantations or woodlands?
A. to maintain a single central leader B. repair storm damage C. promote clear trunks
D. All of the above
- Which pruning type is often recommended for spring flowering trees?
A. Summer pruning B. select pruning C. Total pruning D. all

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points
You can ask you teacher for the copy of the correct answers

Operation Sheet -4

4.1 Techniques of tree pruning operation

A. Materials, tools and Equipment :

- I. Climbing gears, Chipper, Ropes Safety harness Saddle
- II. Chainsaw, Ladder Secateurs, Steel cap boots, Safety helmet
- III. Gloves, Eye protection, Elevating work equipment, Steel cap boots

B. Procedures of tree pruning operation Techniques.

1. Place traffic control devices prior to beginning work
2. Staff should wear the appropriate personal protective equipment(PPE) for all pruning operations
3. Prune all trees following the requirement previously listed for the appropriate pruning operation
4. Use the most efficient method for pruning including, aerial truck, ladders, rope and saddle equipment, and extendable saws
5. Chip or clean up all debris generated during pruning operation prior to leaving the site
6. No equipment or debris shall be left on site overnight



LAP TEST-4	Performance Test
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hour. The project is expected from each student to do it

Task-1 Perform pruning operation techniques

LG #33	LO #5: Clean up and store work place
Instruction sheet	
<p>This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:</p> <ul style="list-style-type: none"> • Checking, preparing and storing tools, equipment and machinery • Storing tools, equipment and machinery • Collecting, disposing or recycling of waste material <p>This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:</p> <ul style="list-style-type: none"> • Apply check, prepare and store tools, equipment and machinery • Understand storing tools, equipment and machinery • Perform collecting, disposing or recycling of waste material 	
Learning Instructions:	
<ul style="list-style-type: none"> • Read the specific objectives of this Learning Guide. • Follow the instructions described below. • Read the information written in the information Sheets • Accomplish the Self-checks • Perform Operation Sheets • Do the “LAP test” 	

Information Sheet 5

5.1 Checking Tools, equipment and machinery

Hand tools

- All tools used shall be kept in good working condition, be properly sharpened where applicable, and shall be restricted to the use for which they are intended.
- Handles shall be securely and correctly attached to tools. All wooden handles shall be of firm Straight-grained stock and free from defects. Do not use tools with loose handles. Check wooden handles for cracks or splits. Damaged handles shall be replaced.
- Split axe heads, damaged or mushroomed steel wedges, hammers and similar equipment shall be properly repaired or replaced.
- A maul or other suitable tool shall be provided for the driving of wedges.
- Pole pruners should be provided with guards, preferably of leather, to cover the cutting heads when the pruners are not in use.
- Jackdaws shall have a guard or pouch equipped with a strap, rope or snap so they can be secured to the worker's belt during work or while changing positions.
- Saws, pruners and other tools should not be carried in the worker's hands while climbing. They should be raised and lowered by tool lines or clipped on to the climbing harness. Canvas buckets are ideal for small tools.
- Tool lines should be attached to the end of the tool so that there is less chance of the tool being caught in obstructions when raising or lowering.
- Do not drop or throw tools to the ground in general operations. If it is necessary to drop or throw tools to the ground, a warning shall be given and the ground area cleared.
- All tools shall be removed from a tree when the worker has finished the task or when a crew is finished for the day.

5.2 Storing tools, equipment and machinery

Tools and equipment require proper care and maintenance, not only for longevity but also to remain useful and safe for the task at hand. Here are some care and maintenance practices for tools and equipment.

Proper storage

Proper storage entails shielding tools from harsh weather conditions, damage and theft. It is particularly crucial for metallic tools to be kept away from moisture to avoid rusting.

Having a cabinet where these tools and equipment are stored will be vital to ensuring a secure storage area. Also, greasing, lubricating or oiling metallic tools and equipment is essential to prevent rust from forming while keeping the tools in the best condition for future tasks.

Using tools and equipment for their right task

Using a tool for the task it is intended helps to keep it in its best shape. This reduces unnecessary damage and protects the user. It is also important to check whether the tools are in the right condition before using them.

Cleaning after use

Storing dirty tools without cleaning them can cause them to deteriorate. Routine cleaning reduces the chances of rust and can reduce the rate of wear and tear.

Inspect tools regularly

Regular inspection of tools is beneficial since it provides an opportunity to see if tools may need repair or replacing. Inspections can help to prevent a situation where a last minute trip to the store to purchase a new tool or spare parts delays a project.

Read and follow manuals

The manuals that come with equipment, especially power tools, have important and useful guidelines. They instruct and advise on the best way to keep equipment in optimal condition.

5.3 Collecting and disposing Waste

Clean and Disposing Waste

The working area should be kept safe and tidy at all time during and after each pruning work. Any tree materials, debris and wood chips, generated from the pruning work should be removed from the site as soon as practicable and disposed at an appropriate waste depot or landfill.

(a) Accumulation of debris at pruning sites may cause hygienic problems as it provides favorable

Breeding and decomposition sites for insects, fungi and bacteria.

(b) Tree debris of some tree species (e.g. *Leucaena leucocephala*) should be removed from sites as soon as possible in order to prevent the growth of water sprouts from the tree debris.

(c) If trees are infected with pests and diseases such as BRRD, particular precaution measures such as sterilizing the pruning tools by alcohol (75%), soil treatment and properly disinfecting and disposal of infected tree debris should be undertaken.

D. To reduce yard waste generated from pruning work, clean and uninfected wood waste can be utilized as the followings:

(i) To be retained on site to achieve conservation benefits such as providing micro-habitat, composting of organic matters and recycling of nutrients to the environment.

(ii) To be chipped for mulching to improve the quality of soil; and

(iii) to be converted into usable products such as biofuel, furniture, decorative features and handcrafts.

Branch & pruning collection



Self-check 5	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Instruction I: say true for correct statement and false for incorrect one 2 Point.

1. All tools shall be removed from a tree when the worker has finished the task.
2. Saws, pruners and other tools should be carried in the worker's hands while climbing

Note: Satisfactory rating - 4 points Unsatisfactory - below 4 points
You can ask you teacher for the copy of the correct answers

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Operation Sheet -5	
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5.1 Procedure of clean up and store tools, material and equipment

A. Materials, tools and Equipment :

❖ All tools, material and equipment to perform Arboriculture work

B. Procedure of clean up and store tools, material and equipment.

- Cleaning all tools material and equipment after use
- Inspect all tools and equipment regularly
- Read and follow manuals how to store
- Proper storage all tools equipment and tools

LAP TEST-5	Performance Test
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour. The project is expected from each student to do it

Task-1 Perform clean up and store tools, material and equipment

LG #34	LO 6: Record and report support activities
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Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Recording and documenting information
- Maintaining records of ground support
- Communicating work completion and hazards information

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Follow recording and documenting information
- Understand maintaining records of ground support
- Communicating work completion and hazards information

Learning Instructions:

- Read the specific objectives of this Learning Guide.
- Follow the instructions described below.
- Read the information written in the information Sheets
- Accomplish the Self-checks
- Perform Operation Sheets
- Do the “LAP test”

Information Sheet 6

6.1. Recording and documenting information

Recording: The results of workplace monitoring should be collected in a standardized way. Employers should keep the records of the monitoring. This is to enable the assessment of any possible relation between later health impairment. For example, in cases of exposure to silica, coal, asbestos or carcinogenic substances, it may be necessary to keep records for several decades. Arrangements should also be made by the competent authority to conserve the records in an archive, so that they remain available even though an enterprise may close down. Records should include all relevant data, such as details of the site, product, manufacturer and methods of use, including the availability and wearing of personal protective clothing or equipment.

In the event of an emergency, the property should have documentation readily available to employees and emergency services to respond appropriately in the event of an emergency. This information should be displayed or kept on the premises in a place that is easily accessible to the emergency services (for example in the office, workshop or located at the main entrance of the property).

6.2. Maintaining records of ground support

All relevant information concerning safety and health should be maintained and periodically updated in the enterprise's database and should be readily available for the information of workers or their representatives, contractors, inspectors, workers' compensation bodies and any other parties concerned. This may include relevant accident costs.

Documentation should include:

- (a) Safety and health policies and strategic objectives;
- (b) Safety and health measures and strategies;
- (c) The tasks and responsibilities of management, supervisors, workers and contractors;
- (d) The findings of risk evaluation and risk management, including a list of all hazardous substances used in the workplace;
- (e) Records on occupational accidents, occupational diseases and dangerous occurrences which have been reported or notified.

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6.3. Communicating work completion and hazards information

- Common Hazardous and Risk of accessing tree
 - ✓ slipping out of harness not positioned correctly
 - ✓ slipping or falling from branches due to failure of anchor points
 - ✓ dehydration and fatigue
 - ✓ musculoskeletal disorders from awkward positions
 - ✓ falling from height due to incorrect use of ropes, knots and devices like descenders
 - ✓ being struck by falling objects or a throw bag
 - ✓ wildlife related injuries e.g. from wasps, bees, birds, possums
 - ✓ falling from an EWP
 - ✓ contact with overhead electric lines
- Common hazards and risks of using an EWP for tree trimming and removal work
 - ✓ coming in contact with overhead electric lines and adjacent structures
 - ✓ windy conditions
 - ✓ falls from height
 - ✓ unstable, sloping, uneven or soft ground e.g. recently filled excavations that could lead the EWP to overturn
 - ✓ being struck by falling objects
 - ✓ wildlife related injuries e.g. from wasps, bees, birds, possums

Self-check 6	Written test
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Name..... ID..... Date.....

Directions: Answer all the questions listed below.

Instruction I: write short answer

- 1 write common Hazardous and Risk of accessing tree (5point)

Note: Satisfactory rating - 5 points Unsatisfactory – below 5 points

You can ask your teacher for the copy of the correct answers

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ACKNOWLEDGEMENT

Ministry of Labor and Skills wish to extend thanks and appreciation to the many representatives of TVET instructors and respective industry experts who donated their time and expertise to the development of this Teaching, Training and Learning Materials (TTLM).

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