

Plant Pruning (Level 2)

LNS-GNM-2016-1.1

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In the unlikely event of an emergency; remain calm and take instruction from the trainer.

Take note of the following:

- Exit door locations
- Location of first aid equipment
- Location of fire extinguishers and fire alarms
- Assembly area



Participants to think of their favorite plant; what is it and why do you like it?

- Introduce yourself
- Tell us what the plant is
- Tell us why you like this particular plant

The Singapore Workforce Skills Qualification (WSQ) is a national credential system that trains, develops, assesses and certifies skills and competencies for the workforce.

As a CET system, WSQ supports the SkillsFuture movement to

- promote recognition of skills and competencies to facilitate progression, mastery and mobility,
- promote holistic development of the workforce through technical and generic skills and competencies,
- support economic development by professionalising skills and competencies to drive industry transformation, productivity and innovation efforts, and
- encourage lifelong learning.

Relevance

A competency-based system, designed to develop job role-specific skills and competencies, as well as generic skills and competencies that are required across job roles.

Accessible

Does not require academic pre-requisites for entry and recognises prior learning. Available in bite-size modules leading to the award of a Statement of Attainment, which an individual may acquire leading up to a full WSQ qualification.

Progression

Makes available skills and qualification pathways which align to the Skills Frameworks for the respective sectors.

Authority

Statements of Attainment and qualifications are quality assured and awarded by SSG and/or in partnership with established awarding bodies.

Source: SkillsFuture Singapore

Inclusive of LO4: : Manage hazards and risk associated with plant pruning

At the end of the course, participants will have the following knowledge:

K1: General physiological characteristics of various species of plants

K2 Methods to identify decay, unwanted growth, dead materials, infestations, structural and aesthetics defects in plants

A competent individual must be able to perform the following:

A4: Identify contingency pruning requirements arising out of defects, decays, or diseases

LG 2

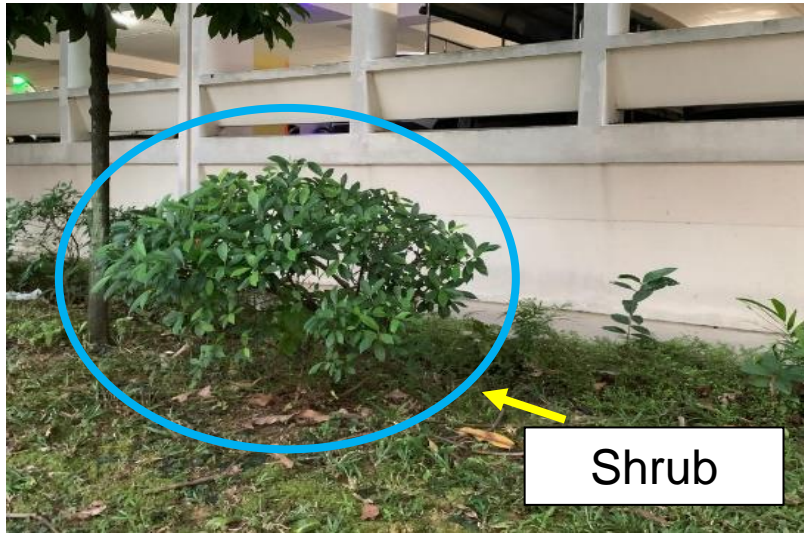
Common Plant Type and their Characteristics

Trees	Palms
Trees are big and tall plants	The stem of a Palm is a long cylinder tube, many without branches.
Trees have very thick, woody and hard stems, known as trunk	The stem varies in size
Trees have a rough skin layer, known as bark.	Palms do not have bark. Some stems of palms have a smooth texture.
The trunk has many branches that bear leaves, flowers and fruits	The leaf, or leaflike part of a palm is known as fronds. The shape of their fronds are pinnate or palmate.



LG 3

Common Plant Type and their Characteristics



Shrubs	Groundcovers
Shrubs are woody plants with several large stems from the base. A group of closed spaced shrubs is known as a hedge.	Groundcovers are plants that grow over an area of ground
Shrubs are usually less than 1.5 meter in height.	Groundcovers protect against soil erosion and excessive soil moisture loss

LG 4

Reasons of Pruning

Routine (Scheduled) Pruning is done to:

- Control the shape and development of plants
- Improve air circulation
- Allow light penetration to prevent the growth of algae and fungi
- Promote growth and production of flowers, buds and fruits

Contingency (Ad-hoc) Pruning is done to:

- Remove dead, diseased or damaged plant parts as these may harbour pests and diseases
- Remove parts that have overgrown and are obstructing the growth or aesthetic of the plant

LG 4

Reasons of Pruning - Contingency (Ad-hoc) Pruning

1. To Remove Water Sprouts, Suckers and Invasive Weeds

- Water sprouts appear from the trunk or branches of a mature plant.
- They are active vegetative growth and need to be removed, if not, they will grow fast in number and size and remove necessary nutrients from the plants.
- They reduce the air and light circulation on the inner branches of a tree or shrubs where the water sprouts usually grow.
- If left to grow on a branch, the branch will naturally become weaker and can break, damage, or spread disease to other parts of the plant.



Prune and remove infested parts of plants to avoid contamination to other parts of plants.

LG 5

Reasons of Pruning - Contingency (Ad-hoc) Pruning

2. To Remove Infested Parts of Plants



Prune and
remove
unwanted
parts of
plant



- Prune and remove infested parts of plants to avoid contamination to other parts of plants.

LG 6

Reasons of Pruning - Contingency (Ad-hoc) Pruning

3. To Remove Dieback and Fallen Dried Branches



Cut right to
the base of
stem and
remove
dieback

- Cut and remove dieback to avoid cross-contamination of diseases to other parts of plants.
- Remove dried fallen branches from the tree as these can cause the decline of flowering due to insufficient sunlight.

LG 7

Reasons of Pruning - Contingency (Ad-hoc) Pruning

4. To Remove Dried and Overhanging Fronds



Remove fallen frond of palm

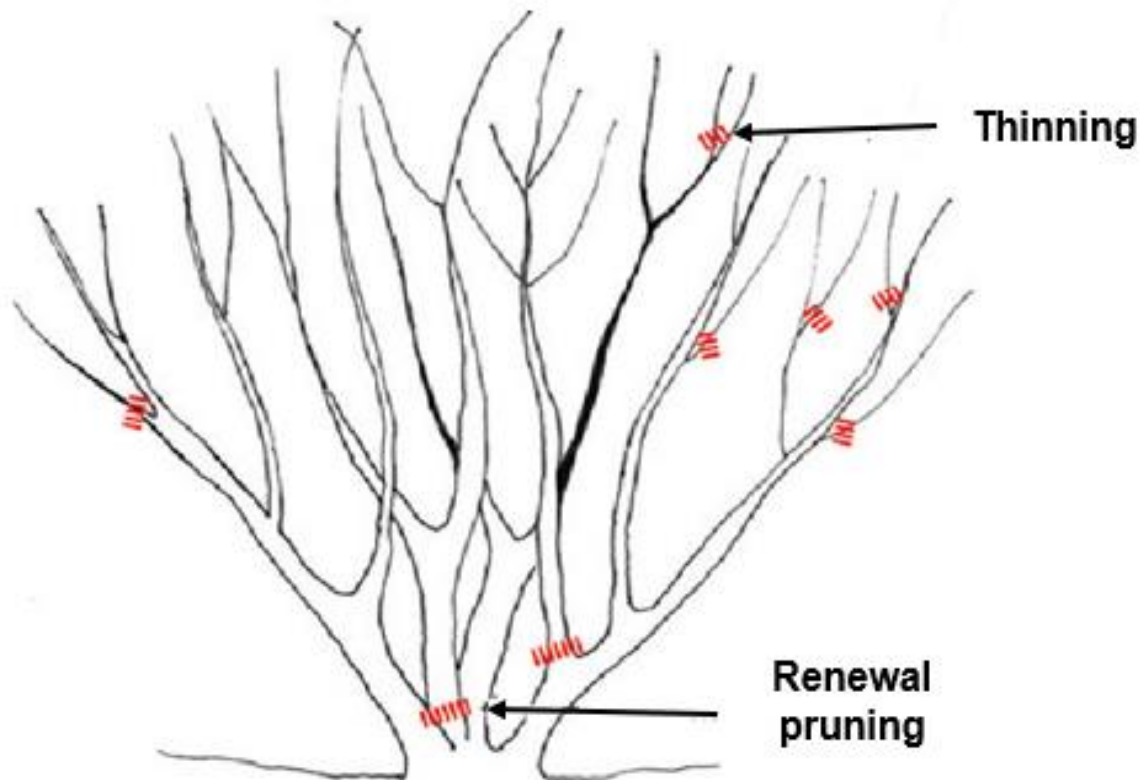
- Removal of infested and dried palm fronds will minimise the spread of disease.
- Do not remove too many fronds as too many frond removal can worsen existing problems and weaken the palm.

LG 7

Reasons of Pruning - Contingency (Ad-hoc) Pruning

5. For Aesthetic Reasons

Aesthetic Pruning of Plants

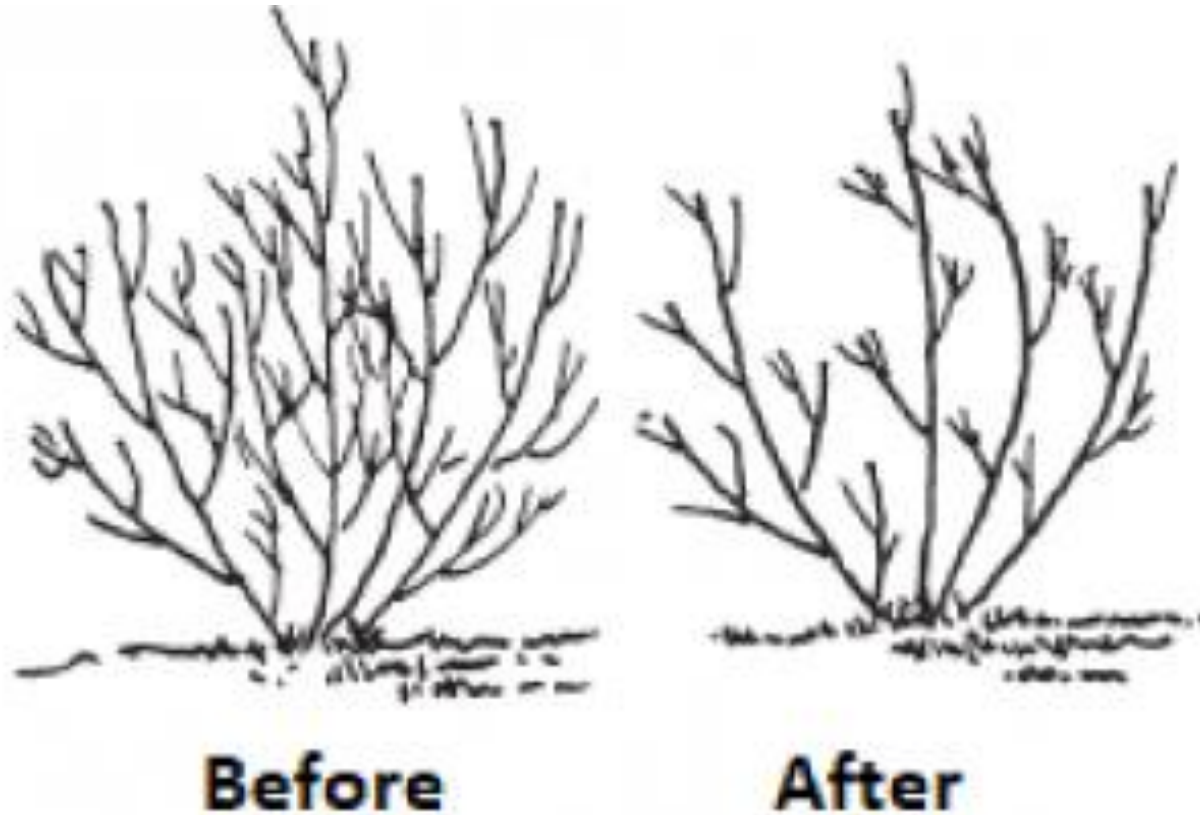


- Allows plants to take shaped over time to enhance their natural form.
- Proper pruning will stimulate plants and improve the aesthetic and health of plants.

LG 8

Reasons of Pruning - Contingency (Ad-hoc) Pruning

6. To Shape and Thin Plants



- Thinning of plants by removing small, individual twigs from the larger stem.
- Allow sunlight to penetrate and better air circulation which can decrease pest infestations and diseases.

LG 8

Learning Activity 1

Form group of three. In your group, identify plants that require pruning. Share your findings, which should include the reasons why pruning is required, with the class.

Inclusive of LO4: : Manage hazards and risk associated with plant pruning

At the end of the course, participants will have the following knowledge:

K3: Application and use cases for tools, equipment, and machinery used in plant pruning

K4: Pruning and shaping methods and techniques for different plants

K6: Personal Protective Equipment (PPE) used in plant pruning

A competent individual must be able to perform the following:

A1: Wear required PPE

A2: Prepare site for plant pruning activities

A3: Determine tools and equipment to be used for pruning

A5 : Perform pruning and shaping to promote desired growth, correcting aesthetic or structural defects, removing decays and infestations, and encouraging fruiting and flowering

A7: Report abnormalities issues and challenges in pruning to the supervisor

LG 9

Prepare for Pruning

Tools and Equipment required for Pruning Activity



Secateurs

- Pruning small twigs and branches up to 2cm thick on plants.



Garden Shear

- To trim hedges.



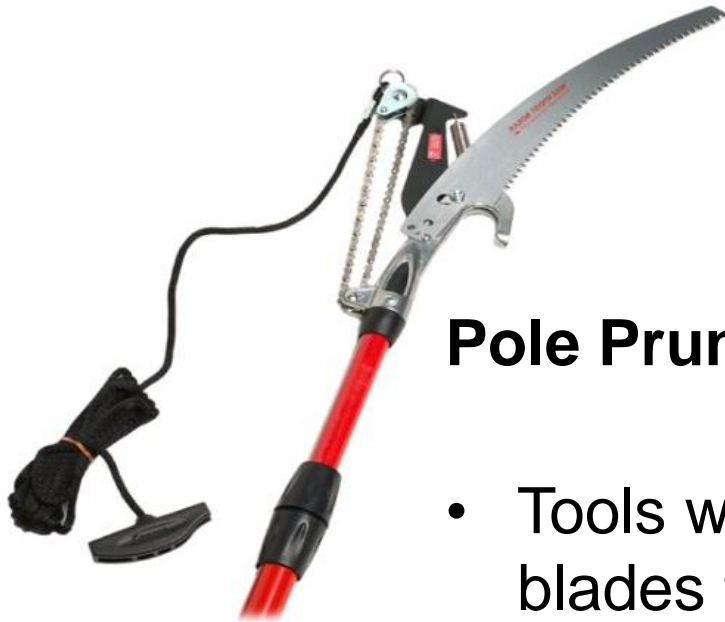
Lopper

- Strong secateurs with long handles
- Cutting thicker branches up to about 4 cm in diameter.

LG 9&10

Prepare for Pruning

Tools and Equipment required for Pruning Activity



Pole Pruner

- Tools with sharp blades that enable you to cut branches overhead to 12 feet (3 metre) or more without needing a ladder.



Hedge Trimmer / Bush Trimmer

- Gardening machinery used for trimming, cutting, or pruning of hedges or small shrubs.

LG 10

Prepare for Pruning

Personal Protective Equipment (PPE) for Pruning



Head Protection – Safety Helmet

- Protect head against any fallen branches when working in area with trees surrounding work zone.



Eye Protection – Safety Goggles/Glasses

- Protect eyes against possible flying branches/clipping when pruning.

LG 10&11

Prepare for Pruning

Personal Protective Equipment (PPE) for Pruning



Ears Protection – Earplugs/Earmuffs.

- Protect ears from noise when using machinery like hedge trimmer when pruning plants.



Body Protection – Safety Reflective Vest.

- Increase visibility when working near roadside or in places with human traffic.

LG 11

Prepare for Pruning

Personal Protective Equipment (PPE) for Pruning



Hand Protection – Cotton Gloves.

- Protect hands from cuts by plants when pruning.



Foot Protection – Safety Boots with steel toe caps.

- Protect feet against dropping of tools and equipment.

Setup Safe Worksite

Check that worksite is cleared from all obstacles, obstructions and hazards, which may include:

- Poor accessibility or physical obstructions blocking access to the plant.
- Too close to public pathway which may cause danger to public onlookers or result in disturbance by onlookers.
- Presence of dangerous insects' hives or nests at the worksite (beehive, ant nest) or animal (snake hiding in the shrub/hedges). If so,
 - Inform supervisor
 - Do not attempt to disturb
 - Move away from worksite location

LG 12

Prepare for Pruning

Setup Safe Worksite

After you have finished checking the worksite, place barricades around the worksite to prevent public from entering. Put up safety and warning signages to warn public to stay away from the worksite.



Clarify Work Instruction before Performing Pruning Activity

- The location, and types of the pruning (trimming, light pruning or heavy pruning) to be carried out.
- The type of plants to prune.
- Timing restriction, if any

All pruning activities to follow regulations such as Environmental Protection and Management Act, Singapore.

Pruning Guidelines

- Pruning should be limited to removing dead or diseased branches or simple shaping to keep shrubs in their proper shape.
- Do not over-pruned as over pruning may damage the plants or stunt their growth. Prune about 1/3 of the overall branches during any pruning session.
- Remove cross branches. Crossed branches will rub against the bark of another branch or trunk, eventually causing damage to the plant. Cross branches also spoil the aesthetic of the plant.

LG 15

Pruning Guidelines and Techniques

Techniques of Cutting Stems and Branches

The diagram illustrates six techniques of cutting stems and branches, each showing a stem with a bud and a cut. The correct technique is shown on the far left, with a diagonal cut above the bud, angled away from it. The other five techniques show incorrect cuts: wrong direction (cutting towards the bud), too close to the bud, too flat (horizontal cut), too much stub (cutting too low), and too large a wound (cutting too deep).

Bud

Bud

Bud

Bud

Bud

Bud

Bud

Correct
Water runs off easily. Wound heals quickly

Wrong direction
Water will run onto bud causing rotting

Too close to bud
The bud may die

Too flat
Hold water which can rot bud

Too much stub
Die back occurs as wound does not heal easily. Infection can occur

Too large a wound
Infection enters wound easily

LG 16

Perform Pruning of Hedges

1. Inspect and check for any infested and damaged parts of plants.
2. Take photos of the affected parts and show them to your supervisor.



LG 16

Perform Pruning of Hedges

3. Stake four wooden stakes into the ground, each at one of the hedge's corners to guide the levelling string.
 - Mallet can be used to assist in the staking.
4. Tie a levelling string around the wooden stakes; the levelling string acts as a height guide.



Perform Pruning of Hedges

a. Pruning using Hedge Trimmer

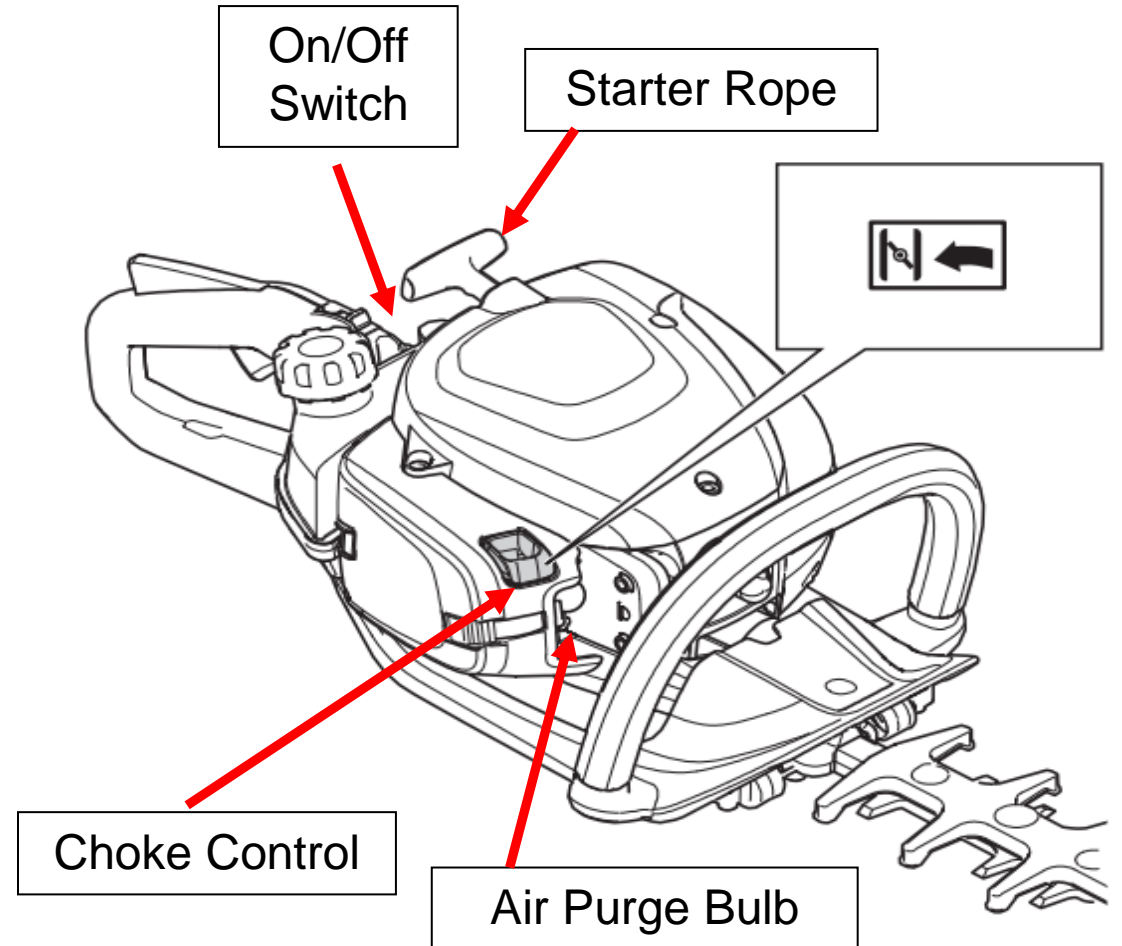
5. Put on the appropriate Personal Protective Equipment (PPE) for pruning works.
6. Check the condition of the hedge trimmer and ensure there is sufficient fuel for the pruning activity.
7. Start the hedge trimmer.

LG 17

Steps to Start the Hedge Trimmer

1. Set the choke control to choke position.
2. Push the air purge bulb approximately 6 times or until bulb fill with fuel.
3. Turn on the hedge trimmer.
4. Hold the body of the hedge trimmer on the ground with your left hand.
5. Pull the starter rope with your right hand till the engine starts.
6. After engine start push the choke control back.
7. Use the throttle to control the engine speed

Perform Pruning of Hedges



LG 18

Perform Pruning of Hedges

8. Check the work area to ensure there are no obstructions which may restrict hand and movement when pruning, or pose a hazard.
9. Start pruning by standing firmly on two feet slight apart when trimming. Trim the tops of hedges by using a wide, sweeping motion with a slight downward tilt.



LG 18

Perform Pruning of Hedges

10. Avoid trimming any branches with a diameter of 2cm or more as the machine is not suitable for thicker branches.



LG 19

Perform Pruning of Hedges

b. Pruning using Garden Shears

11. Touch-up with a garden shear to improve the shape of the hedge.



LG 19

Perform Pruning of Hedges

c. Pruning using Lopper

12. Use a lopper to remove thicker branches, e.g., dead branches, cross branch, and infested parts at the hedge base.

Note: A pruning saw can be used to cut larger shrubs with thicker branches that a lopper cannot cut.



LG 20

Perform Pruning of Hedges

Report Abnormalities in Pruning to Supervisor

If you had observed abnormalities during pruning, such as plants that are dangerous to public or plants that are too diseased or damage to retain, you must report these to your supervisor.

You can supplement the report with photographs to the supervisor.



Practice the following individually:

- Wear appropriate PPE for pruning
- Set up safe zone area
- Prune hedge using a hedge trimmer, garden shear, lopper, and secateurs

At the end of the course, participants will have the following knowledge:

K7: Relevant workplace safety and health (WSH) guidelines

A competent individual must be able to perform the following:

A6: Clear site after completion of pruning works

LG 21

Clear Worksite

1. Use a rake to sweep all cut branches within the work area



LG 21

Clear Worksite

2. Place horticultural waste into disposal bags and tie the bags to secure them to avoid contamination to other plants.



LG 22

Clear Worksite

3. Untie string and remove the four wooden stakes



LG 22

Clear Worksite

4. Remove all safe zone equipment.
 - Roll up red/white tape neatly
 - Stack the safety cones together



LG 23

Clear Worksite

5. Clear all tools and equipment after completion of pruning works.



LG 23

Clear Worksite



6. Keep all tools and equipment at the designated store.

LG 24

Post-operational Housekeeping

Clean your Tools after each Use

- Remove dirt to prevent the spread of diseases to other tools.
- Rinse your tools with water and wipe dry.
- Sanitise with alcohol if the tools were in contact with diseased plants.
- Oil tools to prevent rust such as WD-40.

Storage of Tools, Equipment and Hedge Trimmer

- Store in a dry and well-ventilated area away from sunlight.
- Store machines out of reach of others under lock and key.

LG 25

Post-operational Housekeeping

Reporting Faulty Equipment

If you find a faulty equipment, or one with missing or loose parts, use a repair tag to indicate the fault. If the repair tag is not available, tie a red/white tape on the equipment to inform other people not to use the equipment.

Report the faulty equipment to the supervisor as soon as possible.

At the end of the course, participants will have the following knowledge:

K5: Hazards and risks associated with plant pruning

K7: Relevant Workplace Safety and Health (WSH) guidelines

LG 26

Other Hazards and Risks associated with Plant Pruning

Vibration

The continuous use of vibrating hand-held equipment, including like a hedge trimmer, can result in Hand-Arm Vibration Syndrome (HAVS).

The most commonly observed HAVS is Vibration White Fingers (VWF), which is due to intermittent lack of blood supply to the fingers.



LG 26

Other Hazards and Risks associated with Plant Pruning

Vibration

To prevent Hand-Arm Vibration Syndrome

- Take frequent short breaks
- Keep machine in proper working order, do not attempt to use damaged machine/equipment
- Do not use machinery continuously, depending on the acceleration of the user on the machinery, following table shows the recommended exposure time.

LG 27

Other Hazards and Risks associated with Plant Pruning

Vibration

Vibration generated by hedge trimmer is around 2.3 to 4.5m/s². As per the ACGIH (American Conference of Governmental Industrial Hygienists), it is recommended to operate the hedge trimmer for no more than 4 to 8 hours daily.

Vibration for Common Landscape Machinery				
Machinery				
	Chainsaw	Lawn Mower	Brush Cutter	Hedge Trimmer
Vibration (m/s ²)	6	3.9 to 4.9	5 to 9	2.3 to 4.5

LG 28

Other Hazards and Risks associated with Plant Pruning

Noise

Prolonged exposure to excessive noise can cause noise-induced hearing loss leading to noise-induced deafness (NID).



Earplugs can reduce
up to 35dB(A)

LG 28

Other Hazards and Risks associated with Plant Pruning

Noise

Noise Level for Common Landscape Machinery				
Machinery	 Chainsaw Tree Pruning	 Hedge Trimmer Shrub Trimming	 Brush Cutter Grass Cutting	 Lawn Mower Lawn Mowing
Noise Level dB(A)	91 - 107	92	85 - 90	86
Household Appliance	 Food Processor	 Hairdryer	 Electric Mixer	 Vacuum Cleaner

LG 28

Other Hazards and Risks associated with Plant Pruning

Noise

Sound Pressure Level dB(A)	Maximum Duration per Day
85	8 hours
88	4 hours
91	2 hours
94	1 hour
97	30 minutes
100	15 minutes
103	7.5 minutes
106	4 minutes
109	2 minutes
111	1 minute

Permissible Exposure Limits for Noise extracted from WSH (Noise) Regulations 2011

LG 29

Other Hazards and Risks associated with Plant Pruning

Noise

Noise Prevention and Control Methods

- Use hearing protectors (Earmuffs or earplugs) properly.
- Reduce noise exposure by limiting the duration of machinery usage.
- Keep sufficient distance from your co-workers when operating a hedge trimmer.
- Minimise the number of noisy machineries running at any one time.
- Proper usage of earplugs can reduce up to 35dBA, which allow safe work greater than 8 hours if required.

LG 29

Other Hazards and Risks associated with Plant Pruning

Heat Stress

It is important to protect yourself from extreme heat and solar radiation by:

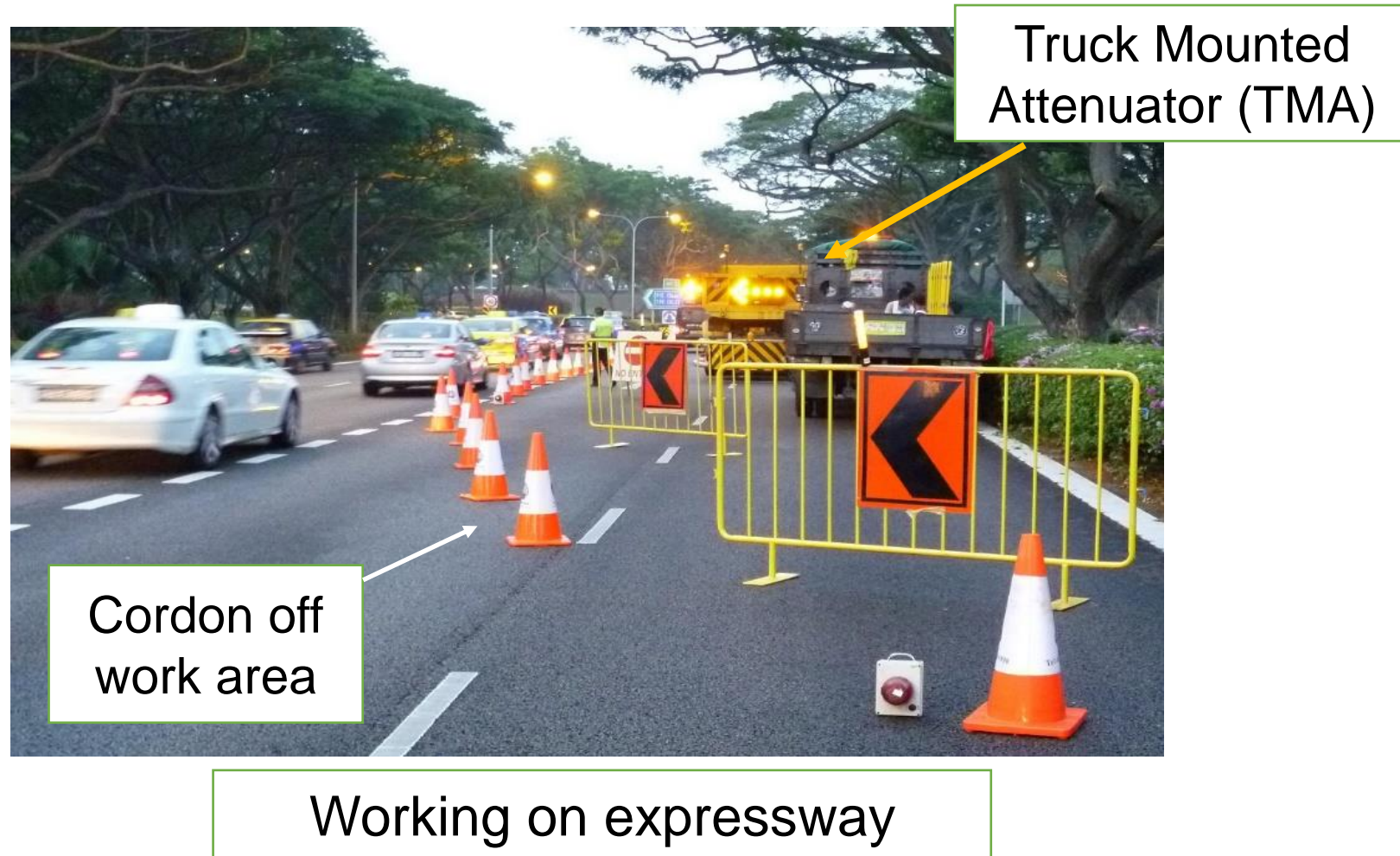
- Drinking plenty of water.
- Wearing cooling and protective clothing.
- Wear soft hat and sunglasses to block out direct sunlight contact.
- Monitoring yourself and your co-workers for symptoms of dehydration or heat exhaustion.

Manage hazards and risks associated with plant pruning

LG 30

Other Hazards and Risks associated with Plant Pruning

Working at Roadside



LG 31

Other Hazards and Risks associated with Plant Pruning

Working at Roadside

The following control measures in LTA's Code of Practice must be adhered to while working along the roadside:

- Cordon off the work area.
- Re-direct traffic flow.
- Install TMA (for expressway) and placement of warning lights and signages.
- Workers must wear luminous vests to enhance their visibility.
- Establish the work zone and its removal, especially near fast lanes, expressways, and major roads.

1. Participants will need to take the assessment at assigned assessment sites.
2. The assessment consists of
 - Practical Performance
 - Oral Questioning
3. Candidates will be assessed on performance criteria and knowledge items stated in competency standard.