

Guidelines on Arboriculture Occupational Safety and Health

**GREENING, LANDSCAPE AND TREE MANAGEMENT SECTION
DEVELOPMENT BUREAU**

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1.0 Introduction

1.1 Risk is inherent in all forms of works and tree work is no exception. A culture of safety and health is essential in any organisation. This should permeate all levels of the organisation and be established and maintained through training, qualifications, procedures, etc. Under **Section 6(1) of the Occupational Safety and Health Ordinance**, “*Every employer must, so far as reasonably practicable, ensure the safety and health at work of all the employer's employees.*” Employer covers both the employer of a company and of a service contract.

1.2 Tree work includes pruning, tree removal, cabling, bracing, guying, cavity treatment and/or other arboricultural treatment to be undertaken at ground or elevated level. Tree work, if not properly carried out with adequate safety measures, can be hazardous for those engaged in it and for people and property in the vicinity of the work.

1.3 Provision of a safe system of work is essential and tree work should be undertaken by trained and experienced personnel. A suitable and safe method should be adopted and adequate occupational safety and health measures should be implemented in carrying out the tree work. Such information, instruction, training and supervision as may be necessary to ensure, so far as reasonably practicable, the safety and health at work of the employer’s employees should also be provided.

1.4 Employers and employees are highly recommended to visit the Labour Department’s website (<https://www.labour.gov.hk/eng/index.htm>) to acquire the most updated requirement, guidelines, code of practices etc., on occupational safety and health requirements.

2.0 Provision of a Safe System of Work

2.1 A safe system of work is a formal procedure which results from systematic examination of a task in order to identify all the hazards. It defines safe methods to ensure that hazards are eliminated or risk minimized.

2.2 Where hazards cannot be eliminated and some elements of risk remain, a safe system of work should be developed and put in place before commencement of tree work.

2.3 Employers responsible for tree work should provide and maintain safe system of work to ensure the safety and health of the employees/workers involved in tree work. This requires the employers to assess the task, identify the hazards, define safe methods, implement the system and monitor the system.

2.4 Reference should be made to the Labour Department's prevailing guidelines on occupational safety and health, e.g. "Safe Systems of Work" and "Five Steps to Information, Instruction and Training" (https://www.labour.gov.hk/eng/public/content2_8d.htm).

3.0 Team Work

3.1 Tree work is a team work which should be carried out by trained and experienced personnel. The employer should assign a **Tree Work Supervisor**¹ who is competent to supervise the tree work to ensure that the work is carried out in accordance with good arboricultural practice and adequate occupational safety and health measures, including procedures as laid down in the safe system of work.

3.2 Workers participating in tree work operations should receive relevant training for the assigned tasks to be performed. As a general rule of thumb, tree work operations should not be performed alone by a general worker, specific personnel shall be deployed to conduct specific types of works, e.g. tree climber and chainsaw operator, and effective communication should be maintained between members of the team.

4.0 Adoption of a Suitable and Safe Method

4.1 The Tree Work Supervisor should assess the task, identify the potential hazards, evaluate the risks and formulate the most appropriate and safe method to carry out the tree work. Risk assessment on the potential hazards, method to be adopted and relevant occupational safety and health measures to be implemented should be prepared and properly documented and communicated to all personnel involved in the tree work.

4.2 Wherever practicable, the work should be carried out from ground level. This may be achieved by using suitable job method such as using extending equipment or tools to perform the work from ground level.

4.3 If it is inevitable to work at height, appropriate access equipment such as

¹ For the definition, duties and requirements of Tree Work Supervisor, please make reference to the Registration Scheme for Tree Management Personnel under the Development Bureau (<https://www.greening.gov.hk/rstmp/en/introduction/index.html>). Field Assistant Grade and Field Officer Grade staff in the Agriculture, Fisheries and Conservation Department and Amenities Assistant Grade and Leisure Services Manager Grade staff in the Leisure and Cultural Services Department who have completed the recognised vocational training offered by the respective departments are considered to be qualified for conducting the specific tree work of Tree Work Supervisor under this guideline.

elevating work platforms, scaffolds, podium steps or ladders should be used as safe means of access. Also, elevating work platforms and scaffolds should be used to provide safe means of support when work is being carried out.

4.4 In situations where the use of the above means are not reasonably practicable, other alternative means, such as the use of rope access system, can be considered. The Tree Work Supervisor should confirm the appropriateness of the method if rope access is adopted. The aerial tree work by climbing should be carried out by a **Tree Climber**, chainsaw of any operational type should be operated by a **Chainsaw Operator**². Relevant safety practices/instructions and devices in accordance with recognised standards should apply (see paragraph 5 below).

4.5 Before carrying out the tree work on site, risk assessment on the potential hazards, method adopted, occupational safety and health measures should be properly documented and communicated to all personnel involved in the tree work.

5.0 Occupational Safety and Health Measures

5.1 General

5.1.1 Compliance with the relevant prevailing occupational safety and health requirements and guidelines as promulgated by Labour Department is essential. The following paragraphs introduce the general occupational safety and health measures, which are not exhaustive, associated with tree work for reference. All workers should receive relevant training for the required skills in carrying out tree work. The Tree Work Supervisor should formulate specific occupational safety and health measures to suit the operation.

5.1.2 When tree work is to be conducted at or near public area, the Tree Work Supervisor should assess potential hazards to the public. Appropriate measures, such as provision of warning signs, temporary fencing and/or guarding, should be adopted when there is a potential risk affecting the public.

² For the definition, duties and requirements of Tree Climber and Chainsaw Operator, please make reference to the Registration Scheme for Tree Management Personnel under the Development Bureau (<https://www.greening.gov.hk/rstmp/en/introduction/index.html>). Field Assistant Grade and Field Officer Grade staff in the Agriculture, Fisheries and Conservation Department and Amenities Assistant Grade and Leisure Services Manager Grade staff in the Leisure and Cultural Services Department who have completed the recognised vocational training offered by the respective departments are considered to be qualified for conducting the specific tree work of Tree Climber and Chainsaw Operator under this guideline.

5.2 Good Communication

5.2.1 Good communication should be maintained between Tree Work Supervisor and other personnel and workers involved in the tree work so that each one is well aware of the duty, work arrangement, potential hazards, occupational health and safety measures and progress of the operation. A job briefing should be provided before tree work begins to facilitate good communication in carrying out the tree work on site.

5.3 Personal Protective Equipment (PPE)

5.3.1 All workers should wear appropriate clothing and footwear. Loose-fitting clothing and slippers should not be allowed. The PPE includes, but is not limited to, head protection (helmets), reflective vests, protective gloves, sturdy boots, chainsaw-resistant chaps, safety goggles and hearing protection. They should comply with relevant standards to suit the work required.

5.3.2 Suitable and adequate PPE should be provided for use by all workers involved in carrying out tree work. They should also be trained in the proper use, care and maintenance of PPE.

5.3.3 The employer should implement a monitoring system to ensure proper use of the PPE by the workers. Proper maintenance programme of the PPE so provided by the employer should be in place to ensure that the PPE is kept in a serviceable state as well as a safe-to-use manner.

5.4 Traffic Flow

5.4.1 For tree work to be performed in area with traffic or pedestrian flow, Temporary Traffic Arrangement (TTA) has to be instituted to protect the safety of the public as well as the workers. Adequate lighting, signing and guarding complying with the requirements of "Code of Practice for the Lighting, Signing and Guarding of Road Works" issued by Highways Department should be provided (https://www.hyd.gov.hk/en/technical_references/technical_document/code_of_practice/index.html).

5.5 Underground Utilities

5.5.1 Underground utilities include gas pipes, electrical cables, cables for

telephones, water pipes, drainage and sewerage pipes buried underground. Tree work, such as planting or removal of tree stump, may cause damage to underground utilities which in turn poses hazards. The presence of underground utilities should be checked and identified on site prior to works with adequate precautions if the required excavation or stump removal work, particularly removal of large deep-rooted stump along public pavement, may affect the underground utilities.

5.5.2 When working in the vicinity of utilities, hand tools should be used with due care. Relevant utility companies should be contacted for precautionary protection measures.

5.6 Work at Height

5.6.1 If work at height is required, a safe access, egress and working condition to prevent fall from height, including steep slope, should be provided. The following publications and the prevailing guidelines issued by the Labour Department are relevant (https://www.labour.gov.hk/eng/public/content2_8.htm).

- ◆ “Overview of Work-at-height Safety”
- ◆ “Guidance Notes on Safe Use of Power-operated Elevating Work Platforms”
- ◆ “Code of Practice for Metal Scaffolding Safety”
- ◆ “Code of Practice for Bamboo Scaffolding Safety”
- ◆ “Guidance Notes on Classification and Use of Safety Belts and their Anchorage System”

5.6.2 Apart from the provision of safe access, egress etc., the team should ensure that the structural integrity of the tree is adequate to take up additional loading if climbing up or use any tree parts as an anchor is required.

5.7 Falling Objects

5.7.1 Falling objects may include materials, tools, debris and/or cut tree parts falling from height. Loose tools should be carried in tool bags and properly secured. Throwing of large cut tree parts from height should be avoided as far as possible. Where a working platform is used, the working platform should be fully boarded and toe-boards alongside the edge of working platform should be installed.

5.7.2 Where members of the public may be present within the tree work area, measures to ensure their safety should be instituted e.g. cordoning off the work area with suitable barriers, erecting appropriate warning signs and arranging workers to guard the work area.

5.8 Manual or Mechanical Handling

5.8.1 To reduce the hazards associated with lifting or delivery of tree parts, large tree parts should be cut into smaller manageable sizes. The size of tree parts should be determined by the Tree Work Supervisor to avoid overloading, taking into account the working load of the equipment, machinery and environmental condition, e.g. strong wind.

5.8.2 Tree parts, particularly sizable pieces, should be secured properly before cutting and delivery. Care should be taken for possible physical damage to the worker caused by swinging of tree parts during operation. The following publications and the prevailing guidelines issued by the Labour Department are relevant (https://www.labour.gov.hk/eng/public/content2_8d.htm).

- ◆ “An Employer's Guide to Manual Handling Operation”
- ◆ “An Employee's Guide to Manual Handling Operation”

5.9 Impact with Overhead Obstacles or Tree Parts

5.9.1 Overhead obstacles should be identified, particularly overhead electrical lines and apparatus. Adequate safety precautions, including keeping safe clearance from overhead obstacles should be adopted in carrying out tree work. When elevating work platform is in use, the travelling route should be within the vision of the operator of the platform.

5.9.2 In tree felling operations, the tree can split upward from the back cut (known as “barber chair”) which may hit the worker standing directly behind the tree. The worker should stand to one side of the tree when making the back cut and plan for an escape route on either side 45° opposite to the direction of fall. Adequate steps should also be taken to prevent tree trunk from rolling on sloping site when the branches are removed to minimize hazards to the worker.

5.10 Electrical Hazards

5.10.1 Workers should receive relevant training in handling electrical hazards. Electrical hazards should be identified before performing tree work. These include the existence of overhead power lines, underground cables or electrical apparatus and the use of electrical tools. A safe working distance from overhead electrical line or electrical apparatus should be maintained when carrying out tree work. Reference should be made to the “Code of Practice on Working near Electricity Supply Lines” issued by the Electrical and Mechanical Services Department.

5.11 Use of Equipment

5.11.1 All equipment, including hand tools or machinery, should be inspected prior to operation and should be properly and regularly maintained. The equipment should be fit for the purposes and should comply with relevant standards with evidence of conformity.

5.11.2 Workers should use all equipment in correct posture. They should receive relevant training in the use of hand tools and mechanical equipment, such as pole pruner and chainsaw, so that hazards associated with the use of them can be minimized.

5.12 Heat-Related Disorders

5.12.1 Heat-related disorders include heat stroke, heat cramps and heat exhaustion. They are associated with working under prolonged and/or high environmental heat exposure which results in overheating and dehydration.

5.12.2 As precautionary measures, wearing of suitable clothing to facilitate heat dissipation and provision of adequate drinking water and rest breaks to workers are required. Training on the awareness of heat-related disorders and associated first aid procedures should be provided to all personnel involved in tree work. The following publications and the prevailing guidelines issued by the Labour Department are relevant

(https://www.labour.gov.hk/eng/news/prevention_of_heat_stroke_at_work.htm):

- ◆ “Guidance Notes on Prevention of Heat Stroke at Work”
- ◆ “Prevention of Heat Stroke at Work in a Hot Environment”

5.13 Application of Chemicals

5.13.1 Application of chemicals, such as fungicides and insecticides, is a common practice in tree care operations. The chemicals should be properly labeled and stored in a cool, dry and well-ventilated place away from direct sunlight and dampness. Dosages and application methods as recommended by the manufacturers should be followed. Disposal of chemicals should follow an approved hazardous waste management procedure.

5.13.2 The intake of chemicals can be made through direct contact, inhalation and/or ingestion. Workers should wear suitable protective clothing, gloves, goggles or face shields to prevent direct contact with chemicals. Properly fitted respirators should be worn to protect workers from inhaling harmful chemicals. Eating or smoking should not be allowed during chemical applications and before cleansing procedures have completed after chemical applications.

5.13.3 Workers should also take note of the surroundings and minimize harms to the public caused by inhaling or contacting chemicals. This includes guarding the site with warning notices and paying attention to the wind direction during spraying to avoid spreading chemicals. If required, warning notices should be posted to keep people and their domestic animals off the site after application of chemicals. The following publications and the prevailing guidelines issued by the Labour Department are relevant (https://www.labour.gov.hk/eng/public/content2_8d.htm):

- ◆ “Hazards During Chemicals in Use and Safety Guidelines”

5.14 Inclement Weather

5.14.1 This includes poor weather conditions, such as strong wind, thunderstorm and heavy rainstorm, which adversely affect the safe operation of tree work. With the exception of emergency work performed by well-trained workers having adopted necessary safety precautions, no tree work should be carried out during inclement weather. The following publications and the prevailing guidelines issued by the Labour Department are relevant (https://www.labour.gov.hk/eng/public/content2_8d.htm):

- ◆ “Guide on Safety at Work in times of Inclement Weather”

5.15 Hazards associated with Plants and Animals

5.15.1 These hazards include bites by snakes or insects (such as mosquitoes, bees

and Red Imported Fire Ants) and direct contact with poisonous plants. Training should be provided for identification of hazardous plants and animals and the associated treatment.

5.15.2 Workers should wear suitable clothing and gloves to minimize skin exposure to insect bites and scratches by poisonous plants. They should apply insect repellent to exposed skin when required. If severe reactions upon bites or contact with poisonous plants are observed, prompt medical treatment should be sought.

5.16 Fire Precautions

5.16.1 Fire may result from improper use of gasoline-powered equipment. Smoking should be prohibited when handling flammable liquid. Trucks transporting tree work equipment should be equipped with fire extinguishers and workers should be trained to use fire extinguishers in case of fire to reduce the risk of personal injury and spread of fire to other wooded area. The following publications and the prevailing guidelines issued by the Labour Department are relevant (https://www.labour.gov.hk/eng/public/content2_8c.htm):

- ◆ “Guidance Notes on Fire Safety at Workplaces”

5.17 First-aid and Emergency Procedures

5.17.1 Procedures covering emergency arrangements, rescue and first aid procedures should be formulated and well-communicated to the team members by the Tree Work Supervisor. Emergency drills should be regularly conducted, with the performance properly recorded and reviewed. First-aid kits with appropriate medical and rescue contents should be provided and maintained.

5.17.2 For tree climbing operations, a minimum of two Tree Climbers must be present and one of them should be stationed on the ground, competent and equipped to perform aerial rescue without delay.

5.18 Other references

Other relevant references include:

- ◆ “Best Practice Guide for Safety Requirements in New Zealand Arboricultural Operations”, The New Zealand Arboricultural Association Inc.

https://www.nzarb.org.nz/files/ugd/04025c_1426a1f9b7a2445da27b2e7979ab4c08.pdf).

- ◆ “The Arboricultural Association Safety Guides”, The Arboricultural Association, the UK. (<https://www.trees.org.uk/Help-Advice/Public/Arboricultural-Association-Safety-Guides>)
- ◆ “American National Standard for Arboricultural Operations – Safety Requirements” (ANSI Z133), International Society of Arboriculture, the USA.